

**Town of Belgrade
Planning Board
June 3, 2021 / 6 p.m.**

This meeting will be conducted online via Zoom at
<https://us02web.zoom.us/j/83033101494>

A G E N D A

Call to Order

1. OLD BUSINESS

A. COMMERCIAL DEVELOPMENT – ** Permit extension request **

Applicants/Owners: Solar Fields / Steve Buchsbaum

Location: 242 Manchester Road, Map 7 Lot 25B

Purpose: 12-month permit extension request. Maine Public Utilities Commission (MPUC) is in the process of reviewing the 2-megawatt alternating current solar array project. The PB approved the project on June 18, 2020.

B. SHORELAND APPLICATION – ** Permit amendment request **

Applicant/Owner: Frederic Rancourt.

Location: 93 Ambrose Cove Road (Messalonskee Lake), Map 47 Lot 2.

Purpose: nonconforming lot and non-conforming structure relocate 10 x 16 shed as previously approved by the PB on April 13, 2021. Move shed from under the power line.

2. NEW BUSINESS

A. SHORELAND APPLICATION –

Applicant/Owner: John and Lisa Veilleux

Location: 37 Parkhill Point Road (Great Pond), Map 12 Lot 4.

Purpose: Expansion of nonconforming structure. Construct 24x20 addition with 24x10 porch/screen room to be attached to existing camp.

3. OLD BUSINESS

A. SUBDIVISION APPLICATION –

Applicants/Owners: Tyler Evans / Evans Development LLC

Location: Dunn Road, Map 6 Lot 16B

Purpose: Cedar Mill Ridge : 10+/- lot subdivision reviewed by PB on 10/01/2020.

3. OTHER BUSINESS

A. Consideration of **meeting minutes** from May 20, 2021.

ADJOURN

townofbelgrade.com



From: Steven Buchsbaum <solarfieldsllc@gmail.com>
Sent: Thursday, May 13, 2021 6:45 PM
To: Anthony Wilson <townmanager@townofbelgrade.com>
Subject: Fwd: 2021-00004 RPS Tranche 2 initial meeting

EXTERNAL MESSAGE:

Hi Anthony,

Yesterday, Solar Fields was informed by the Maine Public Utilities Commission that its proposed solar project at 242 Manchester Road has been selected for its "short list". This communication is attached below. This is good news for Solar Fields. While it is premature to celebrate, this is an important milestone.

Given the timing of the MPUC review it is apparent that the project will not be substantially started by June 18, 2021, the one year anniversary of the Belgrade Planning Board approval. Therefore, under the provisions of Section 4.1 of the Belgrade Commercial Development Ordinance, Solar Fields requests an extension of 12 months to start construction of the project.

Please convey this request to the Planning Board.

Thank you.

Steve Buchsbaum



----- Forwarded message -----

From: Wyman, Liz <Liz.Wyman@maine.gov>
Date: Wed, May 12, 2021 at 8:43 AM
Subject: 2021-00004 RPS Tranche 2 initial meeting
To: solarfieldsllc@gmail.com <solarfieldsllc@gmail.com>
Cc: PUC, RPS RFP Tranche 2 <RPSRFPTranche2.PUC@maine.gov>

To: Steve Buchsbaum, Solar Fields



14 Gabriel Dr.
Augusta, ME 04330

T 207.620.3800
TRCcompanies.com

May 12, 2020

Mr. Gary R. Fuller
Code Enforcement Officer/Plumbing Inspector
Town of Belgrade
990 Augusta Road
Belgrade, ME 04917

**RE: Solar Fields LLC, Solar Array Project, 242 Manchester Rd
Commercial Development Application
Belgrade, Maine**

Dear Gary:

Solar Fields LLC (SF) proposes to construct a 2 megawatt (MW) alternating current (AC) solar array Project (Project) on a 25 acre site on Route 135. The parcel of land where the proposed Project would be located is designated on the Town of Belgrade tax maps as Map 7 Lot 25B. Per the Town's Commercial Development Ordinance, the Project requires review and approval as a Conditional Use via the Site Plan Review process. SF is working through the "Act to Promote Solar Energy Projects and Distributed Generation Resources in Maine (L.D. 1711)" and is working to secure regulatory permitting by June 2020. The proposed Project has been submitted by SF into the Maine Public Utilities Commission Distributed Generation Resources Procurement process. In order to qualify as a bidder in this procurement SF must first obtain all of the State and Local permits required for the Project.

Development of the Project requires a Chapter 500 Stormwater Management Permit By Rule (PBR) to be issued by the Maine Department of Environmental Protection. This application was submitted to the MDEP on May 5, 2020 and is issued on May 11, 2020 (PBR# 69867). Additionally, surveys for protected natural resources located a wetland and stream regulated by the U.S. Army Corps of Engineers (USACE) and the Maine Department of Environmental Protection (MDEP) that bisects the property. A nominal amount of soil disturbance, namely for installing a security fence and temporary erosion control measures will occur within 75 feet of the stream and; therefore a Natural Resources Protection Act PBR for activities adjacent to a protected natural resource was applied for and issued on May 11, 2020 (PBR# 69870). The Project does not require any Federal permitting including Section 404 of the Clean Water Act as administered by the USACE.

This letter provides a brief discussion of performance review criteria per the CDO and supports the required permit application. The following attachments provide the necessary design documentation in support of the Commercial Development Review application:

- Attachment 1: Commercial development review application;
- Attachment 2: Title, Right, or Interest;
- Attachment 2: Tax Map 7;
- Attachment 3: Kennebec County Soil Conservation Service Soils Map;
- Attachment 4: USGS topographical map;
- Attachment 5: FEMA 100-year floodplain Map;
- Attachment 6: Aerial Map with Protected Natural Resources;
- Attachment 7: MDIFW Habitat Map;
- Attachment 8: NRPA & Stormwater Permit By Rule Approvals & MDOT Driveway Opening Permit Application;
- Attachment 9: Issued For Permitting (IFP) Civil Drawing Set (including erosion control plan);

- Attachment 10: Solar Panel Construction Detail;
- Attachment 11: MHPC consultation;
- Attachment 12: Aquifer map; and
- Attachment 13: Stormwater Management Plan.

Project Summary

The subject property is 24.9 acres along the east side of Route 135 with a series of unimproved access roads that extend into and around the property (Map 7, Lot 25B). The property is undeveloped and upland portions were most recently used for commercial Christmas tree production until 2011. Stands of remnant coniferous trees remain and will provide visual screening from Route 135 and adjacent dwellings. The property is bisected by a shrub wetland and stream that drains into a man-made pond. A portion of the site is forested and will not be impacted by the Project. The entire solar array project will encompass 13.7 acres which includes the fixed and tracker array panels, gravel access driveway, overhead interconnect line, underground utilities, inverter station, security fence, and stormwater management meadow buffer.

SF proposes to develop, finance, construct, and operate a photovoltaic system to produce locally consumed renewable electricity, hence community distributed generation. It is estimated that the 2 MWAC system will generate enough electricity to power 600 average Maine homes. These systems are a combination of a multitude of fixed and tracker solar panels, power station, inverter panel boards, overhead and underground interconnecting circuits, and various metering and safety equipment. The solar arrays include individual fixed-tilt and rotating mounted photovoltaic solar modules on metal support structures. The arrays generate electricity by safely converting solar energy into direct current. The arrays will be wired in parallel to obtain nominal voltage and the direct current is transmitted through a series of conduits to the inverters and transformers. Development of the Route 135 site provides a balance of maximizing electricity output and avoiding adverse impacts to local residents and protected natural resources. The solar array system will run an underground conduit from the inverter and transformer to a new utility pole cluster to interconnect with the local overhead distribution line that runs along Route 135. Central Maine Power Company (CMP) has tentatively agreed to extend three phase power from Route 27 to the Project on Route 135 to upgrade from a single phase to three phase circuit. A new dedicated transmission connection is not required. The power station and associated equipment will be within the secure "fenced" portions of the Project.

The Project will include several string inverters that convert the DC electricity from the solar array to AC electricity so that the electric current can enter the local distribution circuit. The inverters provide ground fault protection and system stats, including voltage and current on AC and DC circuits, energy production and maximum power point tracking. The Project also includes a typical electric transformer that regulates AC voltage before the electricity leaves the site and enters the grid. This equipment will be within the secure "fenced" portions of the Project.

The modules are uniformly dark in color, non-reflective, and designed to be highly absorptive of light. Each module is approximately 3.5 feet by 6.5 feet and will be arranged in groups of 20 to 24 modules, totaling 13 feet by 30 feet. The arrays will be electrically grounded and safe in accordance with national electrical codes. The modules are generally considered to have a useful life of 30 years. Tracking panels turn and tilt as the vertical and horizontal angles of the sun change daily and seasonally. Each tracker will range in size from 13 to 21.5 feet tall but angled according to the angle of the sun.

The solar panels are secured to a system of steel racks that provide support and positions them in a southerly direction and angle to absorb the maximum amount of solar energy. The length of each array, essentially rows of panels, varies depending on the east-west width of suitable land, which allows for an effective design that avoids impacts to protected resources. The racks are supported by metal posts (tube or w-shape structural steel), which, depending on final racking design, are drilled or driven directly into the ground. In areas of shallow ledge, the foundations may be pinned and/or grouted and a shallower depth.

The infrastructure for the Project is very rudimentary with an existing unimproved driveway from Route 135 entering the Project. The access road will require improvements for drainage and stability and extends approximately 650 feet into the site terminating at a 96-foot diameter turning pad. This will provide access for construction and operations and maintenance. The driveway will need improvement to support construction equipment, most likely grading and reinforcement with crushed rock and gravel material to a width of 16 feet to accommodate emergency vehicles (i.e., fire apparatus). The existing apron at Route 135 will need improvement. SF has submitted an application to the Maine Department of Transportation (MDOT) for upgrades to the point of connection. The entire facility will be surrounded by security fencing setback from the arrays by a minimum of 15 feet to provide full perimeter access for maintenance vehicles and mowing equipment. There is no "improved" access between the rows of arrays, rather the area between the rows remains grassy and provides stable access. All open areas are mowed and vegetation maintained mechanically no more than twice during the growing season. Herbicides are not used for vegetation management.

Development of the property will require a nominal amount of grading and selective removal of spruce and fir trees that were not harvested during the previous commercial use. The majority of the trees will remain and provide a visual buffer between Route 135 and adjacent dwellings and the Project. The total fenced area, modules and all infrastructure, also known as the Limits of Disturbance (LOD), will encompass 13.7 acres. The site design effectively uses the existing grades to the maximum extent practical to minimize earthwork, but localized grading is needed to partially flatten areas of uneven terrain, and provide a maximum slope of 15% within the array area per array racking tolerances. The array layout provides a balanced site requiring nominal grading as such mass import or export of earthen material is not anticipated or currently proposed.

Construction Summary

Prior to any construction activity, sensitive resources, buffers, access points, limits of disturbance (LOD), and other significant features will be flagged and signed in the field. Construction limits will be surveyed including the security fence, driveway, underground utilities, and LOD. Erosion and sedimentation controls will be installed prior to starting any construction. Materials and equipment delivery will begin before site work and will continue throughout the construction. Larger equipment, such as the clearing equipment and utility poles will be delivered on flatbed trailers. Other Project equipment (e.g., wire, cable, and solar panels) will be transported on standard-width passenger and commercial utility trucks.

The driveway will be reinforced as needed with the addition of crushed rock and gravel. A stabilized construction entrance (consisting of geotextile and crushed rock) will be installed over the apron of the driveway for a distance of 50 feet for stability and to minimize sediment tracking onto Route 135. The setup area for the inverters and a small staging area will be graded and reinforced with gravel.

The solar panel racking posts will either be placed into the ground via direct drilling, pile driving, or vibratory hammering (to a depth of 8 feet, on average). The currently proposed racking system utilizes ground-screw auger foundations however final foundation design will be dependent on future geotechnical investigations. The solar panel racks will be assembled and bolted together in the field onto the posts. The solar panels will be mounted as the racking system is assembled. The inverters will be installed as the solar panel racking is installed. Concurrent with the solar panel racking, the buried DC lines connecting solar panels to the equipment skids will be installed. Trench excavations will be backfilled to match existing grades, and then exposed soils will be temporarily stabilized via mulch cover. The entire site, excluding the driveway, will be enclosed by perimeter fencing which will be installed before the modules are fully installed.

All exposed soils on the Project will be seeded and mulched and stabilized. Final landscaping and fence installation will be completed, and the final construction site staging areas will be removed. All electrical components will be tested and subsequently commissioned and the Project will start supplying power to the grid.

Development Standards

Air Quality: Photo voltaic projects do not generate any emissions and will not create any air pollution.

Access to Public Streets: During the operational phase of the Project vehicle access will be limited to monitoring and maintenance staff that will enter the site on an intermittent basis, such as quarterly inspections. Frequent or regular ingress and egress is not expected and is not necessary for the Project to be functional and in good working order.

During construction traffic will be regular as construction workers arrive and leave once or twice daily. Construction staff will place signage at the driveway advising motorists regarding the ingress and egress, especially relative to delivery and removal of materials and equipment. As larger trucks leave the site the contractor will need to have flaggers present to manage traffic. It is not expected that trucks and equipment will need to park along Route 135.

Erosion Control: Solar Fields and its contractors will comply with the State of Maine Erosion Control Law and will implement the Maine Erosion and Sediment Control Best Management Practices (BMPs). The construction contractor will have full responsibility for the installation and maintenance of all erosion and sedimentation controls. The Stormwater PBR also requires that the project be designed and constructed to meet “Basic Standards” which are essentially the installation of proper Erosion Control Devices (ECDs). The locations of the ECDs are determined onsite depending upon topography, access, and the location of earthwork. Ultimately, Solar Fields and its contractors will ensure that sediments do not flow into any streams or wetlands or flow off the Project. The IFP Civil Drawing Set includes a full erosion and sedimentation control plan (E&SC Plan) prepared and certified by a Maine Licensed Professional Engineer. The E&SC Plan provides construction and installation specifications and details using readily available materials and widely used BMPs. The Site Grading and Drainage Plan identifies the location of proposed BMPs; however, these are minimum required practices and the contractor will be responsible for adapting BMPs to account for construction phasing and actual work conditions encountered.

The primary goal of erosion and sedimentation control is to minimize soil movement and loss, preserve the integrity of environmentally sensitive areas, and maintain existing surface water quality. Important components of the erosion and sedimentation control efforts include placement of ECDs such as silt fence, erosion control mulch berms and socks, staked hay bales, and water bars between all construction and protected resources. Upon completion of construction all exposed soils are seeded with a suitable grass seed mix and stabilized with hay mulch or other suitable stabilization methods (i.e., hydroseeding, erosion control blanket, erosion control mix, etc.). Typically seeding is a temporary measure to stabilize the soil while vegetation regenerates naturally.

Historic and Archaeological Resources: The Maine Historic Preservation Commission (MHPC) was consulted regarding the presence of any known or identified historic or archaeological resources and their response is pending. A preliminary review indicates that there are no historic sites documented through the MHPC Cultural and Architectural Resources Management Archive (CARMA) and through the National Park Service.

Materials Storage: Operations and maintenance of the Project will not require storing any materials onsite and will not generate any solid waste.

Natural Resource Protection: Natural & Scenic Features & Habitat Protection: The Project is bisected by a wetland and stream complex that drains into a man-made pond along the southcentral property boundary. Array panels will be placed on the east and west sides of the wetland and the Project has been designed to avoid impacts to these resources. An existing field road will be improved to serve as the driveway and will not require any wetland fill. The underground electrical conduit will be placed alongside the driveway and will not require any resource impacts. The Project has been designed to maintain a minimum setback of 25 feet from the limits of disturbance to the wetland. The setback from the stream is generally 75 feet, except for one area where the limits of disturbance is within 60 feet of the stream. There is forested wetland and stream along the southwesterly boundary that is outside limits of disturbance.

Noise: Sound emitting components associated with the development will be limited to the transformer located within the Power Station and the inverters, however, this equipment only generates sound during the daylight hours when power is being generated. A typical 2,000 KVA pad-mount transformer emits a sound pressure level of approximate 62dbA and the inverters proposed for this project each emit an audible sound level of 69 dBA at 1 meter (approximately 3 feet). The calculations below estimate sound level anticipated from proposed equipment located within the Power Station and the inverter panel boards. The panel board for the eastern array is the closest to the property boundary and an abutting resident and was selected for analysis. As a conservative measure to account for the possibility of creating a tonal sound (as defined by Maine DEP Chapter 375 – No Adverse Environmental Effect Standards of the Site Location of Development Act) a 5dBA penalty will be added to the anticipated sound levels.

Power Station: The following dampening equation was used to determine the anticipated sound pressure (in dBA) at the nearest property boundary to the equipment pad resulting from full daytime operation of the inverter.

$$Lb = La - 20 \times \log_{10}\left(\frac{Db}{Da}\right)$$

Where:

Lb = Noise level at new distance (dBA)

La = Noise level at original distance (dBA)

Db = New distance from source of noise (meters)

Da = Original distance from source of noise (meters)

The Civil IFP drawings show the layout of proposed Power Station containing the Transformer and it's proximity to the parcel boundaries. The shortest distance from the Power Station to the parcel boundary will be approximately 190 feet or roughly 58 meters. Using the equation described above, the anticipated sound level is calculated as follows:

$$\text{Property Line } Lb = 62 \text{ dBA} - 20 \times \log_{10}\left(\frac{58m}{1m}\right) = 26.7 \text{ dBA}$$

After applying the 5dBA penalty, the anticipated sound level at the property line from the transformer would be approximately 32dBA.

Inverter Panelboards: Each of the two panelboards contain eight (8) SMA inverters and therefore the sound levels need to be added together to determine the combined sound level from the collocated equipment:

Add Multiple Sound Levels of equal Strength - $L_t = L_s + 10 \log_{10}(n)$

Where:

L_t = Total sound level (dBA)

L_s = Sound Level from Each Source (dBA)

n = Number of Sources

8 SMA Inverters = $L_t = 69 + 10 \log_{10}(8) = 78 \text{ dBA}$

The Civil IFP drawings show the layout of panelboards containing the inverters and their proximity to the parcel boundaries. The panelboard for the eastern array is closest to the parcel boundary and was selected for analysis. The shortest distance from the eastern panelboard to the parcel boundary will be approximately 173 feet or roughly 53 meters. Using the damping equation described above, the anticipated sound level is calculated as follows:

$$\text{Property Line } L_b = 78 \text{ dBA} - 20 \times \log_{10}\left(\frac{53m}{1m}\right) = 43.5 \text{ dBA}$$

After applying the 5dBA penalty, the anticipated sound level at the property line from the combined sound level of the inverters on the panelboard would be approximately 48.5dBA.

Based on the anticipated operations sound levels presented above, daytime sound levels from proposed equipment, including a 5dBA penalty, will be below the daytime noise level of 60dBA required by the Town of Belgrade at the property line. As previously stated the project components do not emit sound when not generating power during the daylight and nighttime hours and therefore will be below the Town of Belgrade's 45dBA threshold between the hours of 9:30pm and 7:00am. It should also be noted that the performed calculations do not account for additional sound dampening associated with trees, vegetation, structures, or other obstructions; therefore, the projected sound levels should be considered as a theoretical maximum and are conservatively high by nature.

Exterior Lighting: Lighting is not required for the operations and maintenance of the Project.

Parking: The need for parking is limited to maintenance and inspection staff who visit the Project on a regular or as needed basis. General parking for the public is not needed.

Public Safety & Emergency Services: The Project should have a minimal need for municipal services during the operational phase. It is expected that there could be a need for first responder services such as fire and police assistance, the improvements to the existing access road were designed to support a fire apparatus with an NFPA compliant hammerhead turnaround. A knox-box, or similar, locking system will be incorporated into the security fence and access procedures will be coordinated with the Fire Department.

Managing vegetation through mowing on a semiannual basis reduces the possibility of a brush fire. The site will be secured by a chain link fence and should deter vandalism and trespassing. During construction there is a heightened possibility of materials being stolen or acts of vandalism. The contractor

will secure the site as soon as the seven-foot tall chain link fence is installed and will keep materials secure and should reduce the need for police and fire assistance. Operation of the Project should not create the need for additional snow removal or road maintenance.

Emergency Services: The information below is based on available operating guidelines (Fire Operations for Photovoltaic (PV) Emergencies, prepared by CAL FIRE, November 2010) and our experience and coordination with other Fire Departments where we have developed projects. Information presented below has been tailored to reflect proposed conditions at the Solar Fields array. This summary is provided to assist the Town of Belgrade in developing Standard Operating Guidelines (SOG) for responding to emergency conditions at the Project.

General Notes

- Access to the main gate will be equipped with a Knox lock system or similar method coordinated with the Belgrade Fire Department.
- Signage will be placed at the main gate in accordance with the notes and details shown on Sheet C-4 of the Issued for Permitting Civil Drawing Set. Signage will state Emergency Contact information for Project operations.
- Facility is unmanned and monitored remotely. Remote monitoring includes smoke detector units within the enclosures of the equipment located on the equipment pad.

First Responder General Precautions

- The solar array system can be de-energized and or have equipment isolated remotely; however, local disconnects are present that require manual operation by qualified and trained staff. Local Fire Department staff are not anticipated or expected to be able to operate the manual disconnects.
- PV modules (panels) have DC voltage during daylight hours and it should be assumed that they are always energized. First responders should avoid contact.
- Maintain safe distance from equipment until facility representative can verify the system is disconnected.
- Electrical components give off gas and fumes during combustion. Personnel should don self-contained breathing apparatus (SCBA) in accordance with Department SOGs.

Fire Response

In the event of a fire, the individual discovering the emergency shall:

- Assess the situation to determine potential safety concerns to life and the environment, with life safety as the priority.
- Contact Facility Operator to determine the appropriate response.

Upon arrival to the Project, responders shall:

- Assess the situation to determine potential safety concerns to life and the environment, with life safety as the priority. **THERE IS NO REASON TO ENTER THE FACILITY IF THERE IS NO IMMEDIATE THREAT TO HUMAN LIFE.**

- Evacuate and secure the area and keep people a minimum of 300 feet away, provided there are no immediate threats to people or non-solar property.
- **LET THE FACILITY BURN. Burning electrical equipment is already damaged and must be replaced.**
- Protect adjacent exposures, such as homes and forested areas, as needed, to limit the potential of the fire spreading. An Indirect attack from outside the perimeter fencing is the preferred tactic and is expected to be suitable for most situations at the Solar Fields facility. Water can be used to extinguish ordinary combustibles near the array. A 30° fog pattern from at least 30 feet away at 100 psi is recommended. Fire crews should don full PPE and station themselves upwind and out of toxic atmosphere as possible.
- If fire must be suppressed within the array fence line, the Operator will direct local authorities on how to proceed.

The following are the most important considerations when responding to a fire or other emergency at the Project:

- Assume solar array components are always energized. DC voltage is always present, even at night.
- Identify and validate the hazard in order to minimize injury.
- Electrical components produce gas during combustion. All responders should use a SCBA in accordance with Department SOGs.
- Do not assume the system is de-energized and do not attempt to de-energize any equipment.
- Do not open any inverter doors until at least 48 hours have passed since the initiation of the event or conditions are verified safe and entry is approved by the Operator.
- Leave the scene in a safe condition after mitigating hazards.

Natural Disasters

- Severe weather events such as snowstorms and hurricanes are possible at the Project. Although much less common, there is also the potential for minor earthquakes, flooding or high wind events (e.g., microbursts). These events should have limited impact on the Project site. The Project is designed and constructed to withstand the extreme weather likely to occur at the Project site (e.g. high winds, hail, lightning, snowstorms, etc.). After an extreme weather event, the Operator will evaluate all equipment for damages and repair, as necessary, to restore full Project operations.

Public Safety

- Access to the Project is limited to trained staff and maintenance personnel only.
- Solar panel arrays are surrounded by a seven-foot-tall chain link fence per requirements of the National Electric Safety Code (NESC). Access to the Project site occurs through gates in the chain-link fence that are secured with a padlock, and only Operator personnel have access to the Project (i.e. Knox Box).

In the event of personnel injury from electric shock or if personnel should become incapacitated while within the Project site, the following procedures should be followed:

- Assess the area for hazards and secure the area to protect additional life from injury.
- Notify the appropriate local authorities by dialing 911 and direct them to the Project access point.
- Local authorities should contact the Facility Operator, to determine the appropriate response procedures and methods for shutting down the nearest components to ensure safe access by EMS personnel.

Screening of Public Roads and Neighboring Properties: The Project includes an undisturbed setback for each of the property boundaries that exceeds the municipal zoning setbacks. Development has been setback from Route 135 for a minimum distance of 135 feet. Forested vegetation, generally a mixture of mature trees, saplings, shrubs, and understory vegetation along Route 135 will remain. A dense stand of fir and spruce trees leftover from the commercial Christmas tree harvest will remain and provide a visual buffer from much of Route 135 and all properties to the north. A second, but younger stand of evergreen trees will remain that will provide a buffer approximately 135 feet from Route 135 and dwellings to the south. These setbacks will effectively screen the Project from the adjacent homes as well as Route 135, as the array panels are generally no more than twelve feet tall and the security fence is seven feet tall.

Signs: The Project does not require any signage or advertising.

Stormwater Management: The Project will not generate additional concentrated stormwater runoff and will not block any existing drainage features or drainage patterns. Natural wetland and stream drainages will remain unaltered. Grading will be needed in some areas to create a flat surface to set the arrays, but the grading will not alter the drainage patterns within the site. Native soils will remain under and around the arrays, as such the natural permeability will not change.

The Project qualifies for a stormwater permit by rule (PBR) per the MDEP Chapter 500 Stormwater Management Rules, due to the location of the Project and the amount of soil disturbance and impervious surfaces. The PBR standards essentially require that the Project must comply with the Maine Erosion and Sedimentation Control Law by fully applying Maine Erosion and Sediment Control Best Management Practices (BMPs). A full erosion and sedimentation control plan, including BMP design and installation specifications, is included in the IFP Civil Drawing Package. The stormwater management standards as outlined in the Belgrade commercial development review ordinance are more stringent than the applicable state requirements, therefore, a full Stormwater Management report prepared under the direction and approval of a Maine licensed Professional Engineer is included with this application to address: stormwater quantity manage (peak runoff rate and volumes), stormwater quality as it relates to phosphorus control, and inspection and maintenance procedures during and after construction. As demonstrated in the Stormwater Management Report, the Project will not have an adverse impact to stormwater runoff discharging from the property.

Wastes: Construction and operation of the Project will not create any sewage or generate any wastewater. Any construction debris such as packaging materials will be removed from the site and will be the contractor's responsibility to dispose of them in accordance with State solid waste disposal laws.

Water Quality: Development and Operation of the Project will not require the use of any water as such a water source is not proposed. The contractor may require the use of a temporary water source for dust control during construction and it will be their responsibility to secure a reliable source.

It is the applicant's intent that construction and operation of the Project will not create any adverse impacts to neighboring private potable water supplies. Contractors will follow daily protocols for avoiding and minimizing petroleum spills and providing immediate response. Of primary importance is providing containment under all equipment when parked overnight, refueling, and during maintenance, which is generally achieved by placing secured tarps underneath. Each piece of equipment must have a spill kit so that crews can quickly respond to a leak and provide proper clean up. All impacted soil must be removed and disposed of at a solid waste facility. The contractors must follow MDEP requirements for reporting spills.

Herbicides are not used for vegetation management during construction and operations and maintenance.

Summary

Solar Fields proposes to construct a solar array project on a 24.9-acre parcel on Route 135 in Belgrade to provide community distributed electric generation. Once operational the Project will generate approximately 2 MWAC of electricity, enough to power 600 average Maine homes. The Project has been designed to minimize site impacts to a reasonable and practicable level. Wetland and stream impacts have been avoided. The Project will maintain an approximate 135-foot wide setback from Route 135 and will be screened by unharvested Christmas trees. Given the surrounding terrain and tree growth, the solar panels should not be visible from Route 135.

Construction is expected to last approximately four months and will generate typical noise, traffic, and dust. The contractor will be responsible for maintaining safe and secure conditions, including managing ingress and egress of construction equipment and materials. Once operational the Project will require a minimal effort for maintenance of the equipment and vegetation management twice during the growing season. The contractor will also be responsible for the proper installation and maintenance of erosion control devices.

Please contact me 207-441-4225 or mchristopher@trccompanies.com with any questions or comments and I will be happy to provide you with any additional information that you need.

Sincerely,



Mark W. Christopher, MS, CWB
Project Manager

Enclosures

cc: Steven Buchsbaum, Tom Daniels

Attachment 1
Commercial Development Application Form

SOLAR FIELDS LLC

376 WEST ROAD

BELGRADE, MAINE 04917

Mr. Mark Christopher

TRC Companies

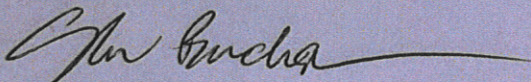
14 Gabriel Drive

Augusta, ME 04330

Mark,

Solar Fields LLC hereby authorizes TRC Companies to act as its agent to obtain permits from the Maine Department of Environmental Protection and the Town of Belgrade Planning Board for the Solar Fields Parker Station project. I understand that you and Tom Daniels will be the principal members of the TRC team working on these matters but it may include other members of the TRC team as well.

Thanks.

A handwritten signature in black ink, appearing to read "Steven Buchsbaum", with a long horizontal flourish extending to the right.

Steven Buchsbaum, President

Solar Fields LLC

207-877-4477

TOWN OF BELGRADE

COMMERCIAL DEVELOPMENT REVIEW ORDINANCE PERMIT APPLICATION

Return fully completed application with required attachments to:
Code Enforcement Officer, Town of Belgrade, 990 Augusta Rd., Belgrade, Maine 04917

To be completed by Town Code Enforcement Officer upon application receipt:

Project Name: _____ Date _____

Received: _____ Application Number : _____

Check One: CEO permit _____ Planning Board permit _____

Application Fee \$ _____ Date paid: _____

Technical Review Fee \$ _____ (if applicable) Date Paid _____

Applicant Information

1. Proposed name of development or new use: 242 Manchester Rd Solar Array Project

2. Property owner:

Name: Solar Fields LLC c/o Steven Buchsbaum _____

Address: 376 West Road Belgrade, ME 04917 _____

Telephone No.: 207-877-4477 _____

Email: solarfieldsllc@gmail.com _____

3. Applicant:

☒ Same as property owner (go to question 5)

Name: _____

Address: _____

Telephone No.: _____

Email: _____

4. Applicant representing self? ____ Yes (go to 6) X No (complete 5)

5. Applicant's authorized agent (must provide authorization letter from applicant):

Name: TRC Companies c/o Mark Christopher & Thomas Daniels

Address: 14 Gabriel Drive, Augusta, ME 04330

Telephone: 207-441-4225

Email: mchristopher@trccompanies.com

6. Person to receive all communications regarding this application:

Steven Buchsbaum & Mark Christopher

7. What legal interest does the applicant have in the property for which a permit is requested (ownership, option, purchase and sales contract, lease, etc.)?

Owner

Note: Must provide documentation of title, right and interest with this application

Does the deed contain any deed restrictions or covenants? ____ Yes X No

If "yes", please list:

Land and Location Information:

8. Location of the property being developed or for which permit is requested:

Belgrade Tax Map 7 Lot(s) 25B

9. Street(s) on which the development or proposed use is located:

Manchester Rd Route 135

10. Total acreage of the parcel(s): 25 acres

11. Existing conditions on parcel:

Structures (no./dimensions/uses): Open fields no structures

Other existing uses of land: forested

12. Is any portion of the property within a shoreland zone, as depicted on Town of Belgrade Shoreland Zoning Map? ☐ Yes ☒ No

13. Is any portion of the property within a special flood hazard area, as depicted on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps? ☐ Yes ☒ No

14. Is the property part of an approved subdivision? ☐ Yes ☒ No

Note: If applicable, provide copies Shoreland Zoning, Subdivision and Flood Plain Ordinance approvals as attachments to application

15. Is the property to be developed located within 500 feet of a municipal boundary?
☐ Yes ☒ No
If yes, which municipality? _____

Note: If within 500' of a town boundary, the other municipality will be notified of this application.

Proposed Development/ Land Use Application Overview:

16. Provide a brief description of the development or proposal (size and number of structures, proposed uses, etc.)

Solar Fields LLC proposes to construct a 2 MWAC Solar Array project on a 25-acre parcel on 242 Manchester Road. The Project includes fixed and tracking solar array panels, inverter station, transformer, above & below ground electric connection lines, gravel access driveway, and security fence. The solar array project can provide electric power to as many as 600 average Maine homes. The Project will connect to the local electric grid via the CMP distribution line that extends along Manchester Road, which will require an upgrade to a 3-Phase line.

17. Are any waivers of the application submission requirements or ordinance performance standards being requested with this submission? ☐ Yes ☐ No.

If yes, please list each here and attach as part of this application a detailed written request and justification for each submission or standard to which a waiver is required:

18. Application Fee required to be submitted: Amount attached \$ 100

If required by the Planning Board, the Technical Review Fee¹ required: Amount attached \$ _____

19. Does this development or change of use propose or require extension or expansion of any of the following public infrastructure? ☐ Yes ☒ No

If yes, check all that apply.

☐ Roads ☐ Storm Drains ☐ Sidewalks
☐ Other (please specify) _____

20. Provide an estimate of cost of the proposed development: \$3-4 million

21. Provide anticipated start and completion construction dates:

Start date Sept 2020 Completion date Aug 2021

22. Will any portion of the land parcel or a structure be dedicated to a public use?

☐ Yes ☒ No If yes, describe:

23. Identify method of water supply:

☐ On-site ground water well
☐ Other, (please specify) Water supply not required.

Is water supply to be used for fire suppression?

☒ Yes ☐ No only for non-electric combustion

What other water uses will the project include? Please specify.

¹ The Technical Review fee is a fee paid into an escrow account to cover the cost of the Planning Board hiring a technical consultant to assist it with its review of application submissions. This fee is only required when needed and at the discretion of the Planning Board.

What is the projected total water demand of the development or use? Not required

☐ Less than 2,000 gallons per day

☐ 2,000 gallons per day or more

Will the water supply meet the State definition of a public drinking water supply system? ☐ Yes ☐ No. If yes, will it be a transient, community or non-transient non-community water system (specify): _____

Note: If a community or non-transient non-community drinking water system, attach to application a copy of your Maine Drinking Water Program approved source water protection plan.

Is water supply adequate for proposed uses and projected demand?

☐ Yes ☐ No.

Note: Provide evidence to support (e.g. letter from local well driller or geologist on anticipated well yields)

24. Identify method of sewage disposal for the proposed development or use.

☐ Individual subsurface disposal system (e.g. septic system)

☐ Central on-site disposal

☐ Other, please state Waste disposal is not required.

25. What Federal or State government permits or approvals are required by this proposed development or use?

Maine Department of Transportation ☒ Yes ☐ No.

If yes, permit type(s): Road/driveway opening permit

Did MDOT require a Traffic Movement Permit? ☐ Yes ☒ No

Note: If vehicle access is to a State highway or the Castle Island Road, attach a copy of the MDOT Entrance or Access Permit. If MDOT requires a Traffic Movement Permit, the associated traffic engineering study or plan is to be provided as part of this application.

Maine State Fire Marshal ☐ Yes ☒ No. If yes, permit type: _____

Maine Dept. of Environmental Protection ☒ Yes ☐ No
If yes, permit type(s): Natural Resources Protection Act Permit By

Rule; Chapter 500 Stormwater Management Permit By Rule

Maine DHHS Drinking Water Program approval of a public drinking water system?
☐ Yes ☐ No Potable water not required

US Army Corps of Engineers ☐ Yes ☒ No. If yes, permit
type: _____

Other: ☐ Yes ☒ No
If yes, specify permit type : _____

26. Are you applying exclusively for approval to mine an existing sand and gravel pit for the next 5 years? ☐ Yes ☒ No

If "yes", skip to question 63

If "not", proceed to question 27.

Information Needed to Assess Compliance with General Development Standards:

27. How will development or proposed use control emissions of dust, ash, smoke, particulate matter or other air pollutants? Dust control during construction will

be sprayed from a tank truck obtaining surface water from an offsite source.

During O&M site will be vegetated and gravel & will not generate air pollutants.

Does proposal meet applicable Federal and State air quality regulatory requirements? ☐ Yes ☒ No

Note: Documentation that the development or land use meets Federal and State air quality regulatory requirements will be sufficient to demonstrate proposal meets ordinance's air quality standard.

28. Estimated peak daily vehicle traffic to be generated: One vehicle per day.

Estimated peak hourly traffic volume: <1 vehicle per hour

How were these figures estimated? Explain or cite methodology used.
Based on experience with solar projects and industry standards it is

generally accepted that solar projects do not require regular daily access.

The site is secured by perimeter fencing & a gate to prohibit public access.

29. How many vehicle access points are to be provided from a road? One

What is the posted speed limit of the road from which vehicles access the proposed development or use? 45 mph

30. Name(s) of contractor(s) responsible for earth work or any soil disturbance and their respective Maine Dept. of Environmental Protection Basic and Advanced Erosion Control Certification No. :

To be determined.

31. Is a site or structure located on the parcel listed on the National Register of Historic Places? Yes X No

If yes, provide name and describe: _____

How will impact on above historical site/structure be prevented or mitigated?

Are any archeological sites identified by the Maine State Historic Preservation Commission present on the parcel?

 Yes X No. If yes, provide name and description:

How will impact on above archeological site(s) be prevented or mitigated?

32. Will equipment, machinery, inventory, parts, salvage, waste collection containers, dumpsters or other materials associated with the proposed use be stored outdoors?

 Yes X No The project will not produce to require storage of such items.

If yes, please describe the types of items to be stored outside and what measures will be taken to prevent children from accessing.

How will dumpster(s) be screened from view from neighbors and public roads?

Dumpsters are not required for operation & maintenance of the project.

33. Does any portion of the parcel include critical natural areas or significant wildlife habitat, including deer wintering areas, as identified and mapped by the Maine Beginning with Habitat Program? ____ Yes X No

Note: Show areas on site plan or provide copy of Beginning with Habitat maps with parcel boundaries indicated as attachment to application.

If yes, describe how impact to those areas and habitats will be avoided or mitigated consistent with recommendations from IFW and Critical Areas Program:

Note:

The Natural Areas Program in the Maine Dept. of Agriculture, Forestry and Conservation offers technical reviews and advice on critical plant communities to developers. See following for more information:

<http://www.maine.gov/dacf/mnap/assistance/review.htm>

If the parcel includes critical natural areas or significant wildlife habitat, contact the Critical Natural Areas Program and/or Maine IF&W regional biologist for written mitigation recommendations for inclusion in your application at time of its submission. Not including will delay review of your application until such time as the Planning Board is able to contact these State agencies and obtain

recommendations.

34. If parcel includes wetlands identified on the National Wetlands Inventory Map, describe how impact to the wetlands will be avoided or mitigated?

The project is designed to avoid fill, clearing, and any temporary disturbance in the wetlands & stream. Setbacks from all protected resources will be a minimum of 60 feet. Erosion controls will be established and maintained during construction.

Note: Show wetland areas on site plan or provide copy of wetland map with parcel boundaries indicated as attachment to application.

35. Is development or change of use located on a hilltop or the lake shore? ____ Yes
X No

Note: If “yes”, the Planning Board may require a visual impact assessment to provide evidence that the proposal will not significantly impact the quality of Belgrade’s scenic resources in accordance with Article 6, Section 6A.

36. Other than from safety signals and other emergency warning devices, will maximum noise levels produced by the proposed use exceed 60 decibels between 7am and 9:30pm, or 45 decibels between 9:30pm to 7am, at the property lines or the lake shore? ____ Yes X No

Will these noise standards be exceeded at any time during the course of a single day for more than 15 minutes? ____ Yes X No

Identify which activities are likely to generate sound in excess of the above standards. Please list and describe:

During operation electrical components will generate noise levels below 60 dba and will not generate noise during the evenings.

Construction will generate expected noise levels during weekday normal work hours as expected from heavy equipment during site preparation.

What noise monitoring, suppression and mitigation/buffering measures are proposed ? Please describe:

The Project has been designed to maintain a dense vegetated buffer between construction and adjacent dwellings.

Note: The Planning Board may require as a condition of approval noise monitoring to ensure compliance with the ordinance's noise standards

37. Will outdoor development construction activities be conducted between the hours of 9:30pm and 7:00am? ____ Yes X No

Are residential uses present on abutting land parcels? X Yes ____ No. If yes to both, what noise suppression measures will be implemented? List and describe:

38. Provide the number, design, location and illumination intensity of outdoor lighting

fixtures: Lighting will be limited to security lights at the inverter station.

Nighttime illumination is not needed.

Will light illumination from the development or use beyond any property line exceed 0.5 foot candles?

____ Yes X No

Note: If yes, attach a lighting plan to reduce errant lighting onto abutting properties to meet this standard.

Note: The Town may require monitoring of illumination levels following development to determine compliance with the ordinance's lighting standard.

39. Describe off-street parking to be provided for the development/use, including number of general use parking spaces, handicapped spaces and over size vehicle spaces to be provided:

Off-street parking is not required.

How often and where will delivery trucks be unloaded and loaded?

During operation & maintenance deliveries will not be required.

Will vehicles loading/unloading protrude into a public road?

____ Yes ☒ No

Will delivery vehicles need to back into unloading/loading areas from public road?

____ Yes ☒ No

How many loading bays will be provided as part of off-street parking:

Not applicable

40. Describe measures to be provided for security and fire protection for the proposed development or use.

The project will be encircled by a 7-foot tall security fence with a locked gate at the entrance. A knox box will be placed on the gate for first responder access. A fire suppression plan will be provided to the town.

Is the footprint of any building greater than 10,000 sq. ft.? ____ Yes ☒ No

If yes, describe access to be provided to all sides of the building for emergency vehicles: _____

Will development or use exceed the capabilities of the Belgrade Fire Department?

____ Yes ☒ No

Note: Provide a written statement from the Belgrade Fire Chief regarding whether development or use will exceed the capabilities of the Town Fire Department with any recommendations for additional fire protection improvements. If special training or equipment is required by Fire Department because of the use or storage of toxic or flammable materials or other reasons, the developer/owner is responsible for this cost to the Town.

Will development or use depend upon the Kennebec County Sheriff's Department for security services? ☒ Yes ____ No

Note: If yes, provide letter from Kennebec County Sheriff that Sheriff is able to provide requested security services.

41. Is the proposed development or use located within a "Village District" as shown in the Belgrade 2014 Comprehensive Plan land use district map (available at Town office): ____ Yes ☒ No

Note: Vegetative screening and sign standards differ in the Village District from

elsewhere in Belgrade.

42. Describe vegetative screening to be provided and maintained along all public roads (e.g. depth, length, vegetation composition) (also show on site plan):

Avegetative buffer of native species including white pines will be maintained along

Rte 135 and dense stands of planted conifers will be maintained. These features

will provide multiple layers of screening. (5-10 ft wide and approx 50 ft wide, respectively)

43. Describe vegetative screening to be provided and maintained along property line with abutting residential properties (e.g. depth, length, vegetation composition) (also show on site plan):

The nearest dwelling to the south is 150 feet from the project with forested vegetation in

between. To the north the nearest dwelling is 225 feet away with forested vegetation in

between.

44. Provide number, size (sq ft), location, anchoring and height off ground level of each proposed advertising or informational sign (also show location on site plan):

Advertising and informational signs are not required.

45. Will any exterior signs be illuminated? ☐ Yes ☒ No

If yes, will sign(s) be externally or internally illuminated: ☐ Exterior lighting
☐ Internal lighting

Describe shielding to be provided to illuminated signs: _____

Provide hours of operation for illuminated signs: _____

Will sign illumination be brighter than 50 foot candles as measured 100 feet from the sign? ☐ Yes ☐ No

Note: The Planning Board may require monitoring illumination brightness as condition of approval

46. Is any sign to be an electronically (digitally) changeable sign? ____ Yes ☒ No

If yes, provide the minimum time duration a message will be displayed before changing to the next message:

47. Describe solid waste to be generated, including types of waste:

Operation & maintenance will not generate solid waste.

Estimated volume per year to be generated (cu. yd/year): 0

Method/location of disposal for solid waste: N/A

48. Will oil, petroleum or propane be stored or handled on-site (other than during project construction, a heating oil tank smaller than 330 gallons or a propane tank 200 gallons or smaller) ?

☒ Yes ____ No

If yes, describe types and volumes of products:

The electric transformer will be delivered to the site with about 525 gallons of dielectric mineral oil installed. The oil will not be handled or transferred.

How will be stored on-site? Check all that apply. ____ Underground tanks ____ Above ground tanks ____ Drums ____ Other

(describe): Oil will not be stored, but will be in an enclosed tank as part of the system that operates the transformer.

Which State or Federal permits, registrations, notifications or approvals are required to store or handle oil, petroleum or propane associated with this proposal? None required

If an underground oil storage facility is proposed, provide the Maine DEP registration number: None required

If a Maine State Fire Marshal permit is required for construction of above ground oil storage tank(s), provide permit number: Not required

Is a U.S. Environmental Protection Agency Spill Prevention Control and Countermeasure (SPCC) Plan required? Yes X No

Note: If yes, attach copy of current SPCC plan to application.

List all other applicable license, permit or registration numbers for oil, petroleum or propane storage, including but not limited to Maine Fuel Board:

49. Will hazardous substances be stored on-site or used? Yes X No

If yes, specify types and quantities:

50. Will hazardous, special or universal wastes (including waste oil and waste antifreeze) be generated by the project or use?
 Yes X No. If yes, provide the following information.

Describe type, characteristics and estimated quantity of waste:

How will these wastes be properly stored and handled on-site?

How/where will these wastes be disposed? Describe:

Which State or Federal permits, registrations, notifications or approvals are required to generate, store, handle or dispose of these wastes? List all applicable and provide license, permit or registrations numbers:

51. If you answered "yes" to any of questions 48-50, provide the following information:

Will any portion of your development or use be located on a significant sand and gravel aquifer as mapped by the Maine Geological Survey? ____Yes XNo.

Note: Show the location of the proposed development or use on a Maine Geological Survey Significant Sand and Gravel Aquifer map. Attach to this application.

Will any portion of your project or use be within 300 feet of a private drinking water well, 1,000 feet of a public drinking water supply well, or within the source water protection area of a public drinking well as mapped by the Maine Drinking Water Program? XYes ____No

Note: If the development or proposed use will involve the production, use, handling or storage of hazardous substances, oil or petroleum (not propane), and is located on a Significant Sand and Gravel Aquifer or within the source water protection area of a public drinking water system, within 1000' of a public well, or within 300' of a private well, the application must include written documentation from the Maine Dept. of Environmental Protection that the development or use will comply with agency regulations, Chapters 692 and 700, in the form of a variance from those rules or a letter indicating the prohibitions on location over aquifers or near public and private drinking water supplies does not apply

52. Will the proposed activity discharge pollutants to any surface waterbodies or ground water, including by way of subsurface waste water disposal system? ____Yes XNo

If yes, describe discharge and its physical, chemical and biological characteristics:

Note: If a subsurface waste water discharge system (e.g. septic system) is proposed, show location on the site plan and provide a copy of the Maine Department of Health and Human Services HHE-200 form prepared and signed by a Maine licensed Soil Site Evaluator, including a map of the location of all soil test pits, and any permit from the Maine Department of Environmental Protection or the Dept. of Health and Human Services Plumbing Program.

53. Will any ground water discharge result in any ground water quality measure exceed one-half of a Federal primary drinking water standard or State maximum exposure drinking water guideline? ____ Yes X No Ground water discharge not required

Will ground water exceed any Federal secondary drinking water standard?
____ Yes X No

54. Will ground water withdrawal, including for a drinking water supply or alterations to site surface water recharge characteristics lower the ground water table beyond the property line? ____ Yes X No

Note: If ground water withdrawal is projected to exceed 2,000 gallons per day, a written assessment is required of the impact on ground water quality and quantity to be prepared by a Maine certified geologist or registered professional engineer with experience in ground water. This assessment must meet the requirements of Article 6, Section 15.A.2. Provide copy of ground water assessment as part of this application.

55. Provide the total area (sq. feet) of impervious area of the development or use, including but not limited to the footprint area of all structures, as well as paved and gravel parking, roads, walkways, etc. 17,712 sq. ft.

56. Provide the total square feet of disturbed area of the development or change of use: 19,375 sq. ft.. Disturbed area includes the total area cleared of native vegetation, covered with fill, stripped of soil, graded, excavated, or covered by structures, walkways, parking or outdoor storage. **Total limits of disturbance 13.7 acres**

57. How many linear feet of new road or driveway is proposed? 715 ft.

58. In which lake watershed(s) is the proposed development located? Please specify: Belgrade Stream & Messalonskee Lake

59. What is the allowed phosphorous export in pounds per acre as established by Article 6(B) of the ordinance's (see table of permitted phosphorous export)?
0.068 pounds/acre

Note: If a development is located in the watershed of more than one lake, the lower phosphorous standard shall apply.

60. Has this development received a Stormwater Management Permit from the Maine Dept. of Environmental Protection under the Maine Stormwater Management Law? X Yes No stormwater permit by rule pending

If yes, provide a copy of this permit as part of this application. Receipt of this permit shall demonstrate that the development meets the phosphorous control standard of the ordinance.

Note: If your response to question 60 is "No", AND the development as proposed will exceed 15,000 sq. ft. of disturbed area, OR exceed 7,500 sq. ft. of impervious surfaces, OR will include more than 250 feet of new road or driveway; phosphorous export from the development must be controlled in accordance with the requirements of Article 6(B), including a stormwater and phosphorous control plan must be submitted as part of this application, with its control features shown on the site plan.

If the total disturbed area will exceed 30,000 sq. ft. OR the linear length of proposed roads or driveways exceed 350 ft., the stormwater and phosphorous control plan must be prepared and the control features designed by a Maine registered professional engineer in accordance with the Maine Dept. of Environmental Protection's manual *Phosphorous Control in Lake Watersheds: A Technical Guide for Evaluating New Development*, Sept. 1992 or as revised. The plan and stormwater/phosphorous control features on the site plan must be signed and stamped by the Maine professional engineer responsible for their design and development.

If the development includes 30,000 or less square feet of disturbed area AND 350 linear feet or less of new road or driveway, stormwater and phosphorous export may be controlled utilizing the ordinance's *Simplified Phosphorous Control Method*, relying upon vegetated buffers to infiltrate runoff and of dimensions prescribed in Article 6(B) of the ordinance.

61. Describe here or in your storm water and phosphorous control plan provisions for monitoring and inspection, maintenance and use restrictions for stormwater/phosphorous control measures, including buffer strips and infiltration systems:

Please refer to the stormwater management plan attached as part of this application.

62. Is the development or change of use to include (check applicable): None are applicable

____ New mineral extraction or a processing facility. Provide supplemental information requested by questions 64.

____ Overnight accommodations (other than a bed and breakfast) Provide supplemental information requested by question 65.

____ Bed and breakfast. Provide the supplemental information requested by question 66.

____ Telecommunication tower. Provide supplemental information requested by question 67.

____ Wind energy facility. Provide supplemental information requested by question 68.

63. For existing gravel, sand or other mining operations (only), seeking operating approval for an additional 5 years, provide the following information: Not applicable

Will there be an increase in the number or footprint of on-site buildings?

___Yes ___No If "yes" describe and show on site plan:

Will there be an increase in the footprint area of impervious surfaces?

___Yes ___No If "yes", describe and show on site plan:

Will there be an increase in the volume of toxic, flammable, combustible or hazardous substances to be used or stored? ____Yes ____No If "yes" provide details of the materials and how they will be stored and used:

Is any change in existing stormwater or phosphorous control designs or vegetated infiltration buffers proposed? ____Yes ____No Describe in detail and show on site plan:

Will there be any changes to vegetative screening or buffers to neighbors or public roads? ____Yes ____No If "yes", show on site plan and describe in detail:

Will there be an addition of activities or changes in design which may increase noise levels? ____Yes ____No Describe new activities and changes:

Will rock crushing, a concrete plant, an asphalt batch plant or other mineral processing of be added in the next 5 years?
____Yes ____No

Note: If “yes”, a full application is required for Planning Board review and approval under Articles 4, 5 and 6 in addition to Article 7 of the ordinance.

Is a change of use proposed that will generate higher traffic to or from the site?
____ Yes ____ No If “yes”, describe: _____

Is there a proposed change in location or design of any infrastructure used by the general public, including but not limited to roads, sidewalks, street lights, driveway entrances, or parking areas? ____ Yes ____ No If “yes”, describe and show on site plan:

Note: If the Planning Board determines that proposed changes to an existing mining operation are significant, the Board may notify the public in accordance with the notification requirements of the ordinance and provide the public an opportunity to comment.

64. For new and existing mining operations, the following information is required in Not applicable addition to a site plan:

Describe the proposed operating procedures and hours: _____

Provide detailed plans for reclamation of completed areas of excavation or mining (show on site plan and provide a narrative description): _____

Will a 50' vegetated buffer be maintained between any mining or processing operations and public roads and abutting property lines? ☐ Yes ☐ No

Note: Less than a 50' vegetated buffer from an abutter's property line is permitted only if a written agreement to that affect is reached with that landowner, and a copy is provided as part of the application.

What is the steepest side slope proposed in areas of active mining?
_____ (e.g. 2:1, 3:1, etc.)

Will unauthorized access to the mining operation be controlled? ☐ Yes
☐ No How?

Describe how dust and mud will be controlled on a minimum of the first 100' of the access driveway:

Are stationary petroleum storage tanks and an equipment fueling area proposed?

☐ Yes ☐ No

If "yes", will petroleum storage and fueling facilities be designed and operated in accordance with Maine DEP regulations for petroleum storage associated with aggregate mining operations (Chapter 378)? ☐ Yes ☐ No Please provide documentation of such or describe design and operating procedures, including spill prevention, reporting and clean-up. _____

Not applicable

65. If proposing an overnight accommodation, including a hotel, motel, rental cottages, or inn (but not a bed and breakfast), provide the following supplemental information in addition to that previously required elsewhere in this application:

Will this facility be located within a Village District as shown in the Belgrade 2014 Comprehensive Plan's land use map? ____Yes ____No

Will any portion of a building be closer than 50 feet to a property line?
____Yes ____No

Will each rental room be equipped with a hardwired smoke and carbon monoxide detector? ____Yes ____No

Note: Hotel, motel or cottage rentals with self-contained kitchen and bathrooms designed as house keeping accommodations are considered dwelling units and may be subject to review under the Belgrade Subdivision Ordinance.

66. If proposing a bed and breakfast facility for overnight accommodations, provide the following supplemental information in addition to that previously required elsewhere in this application:

Not applicable

How many parking spaces will be provided for guests? ____

How many additional parking spaces will be provided for the owner or operator?

Will each rental room have its own bathroom? ____Yes ____No

Will each rental room have a hardwired smoke detector? ____Yes ____No

67. If developing a telecommunications tower, provide the following supplemental information in addition to that required elsewhere in this application:

Not applicable

Will tower be co-located on existing tower or same parcel as existing tower?
____Yes ____No If "no", demonstrate why locating on existing tower or on
parcel with existing tower is not feasible: _____

What will be the height of the tower above the ground surface to its maximum elevation, including attachments and extensions? ____ feet

What horizontal distance will the tower be setback from property lot lines? (provide details and show on site plan):

Will the tower be a monopole design? ☐ Yes ☐ No

Is the lot upon which the tower will be located owned by the tower's operator?
☐ Yes ☐ No If "no", what is the period of the lease? years

Describe the materials and colors of which the tower will be constructed:

Will the tower be located either on a hilltop or on the shore of a lake? ☐ Yes
☐ No

Note: If "yes", the Planning Board may require a visual impact assessment to provide evidence that the proposal will not significantly impact the quality of Belgrade's scenic resources in accordance with Article 6, Section 6A.

Will the tower be designed and constructed in accordance with the Electronic Industries Association/Telecommunications Industries Association standards?
☐ Yes ☐ No

Note: As part of this application provide written certification by a Maine registered professional engineer that the tower will be constructed in accordance with the above national industry standards

68. If developing a non-residential wind energy facility, provide the following supplemental information in addition to that required elsewhere in this application:

Not applicable

Will turbine(s) be designed by (check): ☐ Manufacturer ☐ Maine registered professional engineer

Provide the maximum height off the ground surface for each turbine:

Note: If the height of a turbine is greater than 100' off the ground surface, a visual impact assessment shall be required as part of this application to determine whether the facility will have an adverse impact on scenic views from a lake or public places within Belgrade.

Provide the setback in horizontal distance for each turbine from property lines, public and private rights-of-way and overhead utility lines:

Will all turbines be provided with an over speed control system? ____Yes ____No
Describe system safety features: _____

Describe safety features of facility to prevent unauthorized access to tower and ground mounted electrical and control equipment: _____

What is the minimum distance from ground level to the lowest arc of the tip of the blades? _____ ft.

Will the tower be a monopole design? ____Yes ____No

What impact will the facility have on wildlife movements and migration? Describe:

Note: The Planning Board may request a study of potential impacts of the facility on

wildlife movements and migrations.

Describe design features and other efforts to minimize the creation of artificial habitat for raptors or their prey: _____

Describe how the facility will be located to maximize screening views of the turbines by utilizing by utilizing existing vegetation, structures, and topographic features:

Describe how the facility will be designed to avoid unreasonable adverse shadow flicker effect on occupied building on abutting properties:

Identify all State and municipal public roads in Belgrade to be used in the transport of equipment and parts for construction, operation or maintenance of the facility:

Note: The Town of Belgrade will engage a qualified third party Maine registered professional engineer reasonably acceptable to the applicant to document the condition of these roads prior to and after their use to transport equipment associated with this development to document any resulting damage. The applicant is responsible for the cost of any road repairs for which they or their

contractors are responsible.

Provide an emergency response plan developed in cooperation with Belgrade Fire and Rescue Department, as well as Kennebec County Sheriff's Department and Maine State police addressing notification to those agencies and coordination with emergency services during the transport of equipment:

Describe the fire suppression system and fire safety measures to be part of the turbines:

Describe the current general liability insurance covering the facility for bodily injury and property damage, including the dollar amount of coverage:

Note: As part of this application, the applicant is to provide a certificate of insurance.

PLEASE READ AND SIGN:

I certify that to the best of my knowledge the information submitted in this application and the attached materials are true, correct and accurate. I understand that before this application can be determined to be complete by the Town of Belgrade; all requested information must be submitted.

Solar Fields LLC c/o Steven Buchsbaum

(Name of Applicant - printed)

(Signature of Applicant)

(Date)

*Submit this form, site plan and required attachments to the Town of
Belgrade Code Enforcement Officer*

MINIMUM REQUIRED APPLICATION ATTACHMENTS²

Attachment	Sources of Information
Copy of deed, option, sales agreement, lease or other documentation of title right or interest	*****
Copy of tax map of property	Town office
Copy Kennebec County soil map of property	https://websoilsurvey.nrcs.usda.gov/app/
Copy of USGS topographical map showing property location	https://www.usgs.gov/products/maps/topo-maps Also available for purchase from: Maine Geological Survey 93 State House Station Augusta, Maine 04333 Phone: (207) 287-2801
Copy of Belgrade Shoreland Zoning map showing property	Town office
Copy of FEMA Flood Insurance map showing property	Town office
Copy of National Wetland Inventory map showing property	https://www.fws.gov/wetlands/
Beginning with Habitat & Natural Areas map showing property	https://webapps2.cgis-solutions.com/beginningwithhabitat/map2/
Copies of other required Federal, State or local permits	*****
24x36" to scale site plan w/ detail drawings	*****
8 copies of the completed application form, required attachments, and to-scale plan drawings reduced to fit on 11" x 17" pages.	*****
Evidence of water supply adequacy	Obtain from your well driller or Maine certified geologist
Soil erosion control plan	*****
MDEP certified contractor name & no.	Obtain from your earth moving contractor or http://www.maine.gov/dep/land/training/cccec.html
National Register of Historic Places listing of historic sites on property	https://www.nps.gov/nr/about.htm
Maine Historic Preservation Commission listing of any archeological sites on property	http://www.state.me.us/mhpc/project_review/index.html

² Other attachments may be required by ordinance depending on nature of proposed development and use along with site conditions. The attachments listed here are those required at a minimum of all applications.

Subsurface waste water disposal site evaluation form (HHE-200)	From your soil site evaluator and designer of your septic system
Exterior lighting plan & specifications for fixtures	*****
To-scale profile (face-on) view of proposed signs	*****
Stormwater management plan	*****
Phosphorous export control plan	*****

BELGRADE COMMERCIAL DEVELOPMENT REVIEW ORDINANCE APPLICATION SUBMISSIONS CHECKLIST

(To be completed by Planning Board chair during review of all applications with exception of Special Permit for 5 year renewals of existing mining operations. Checklist may serve as useful guidance to applicants to ensure application includes all needed maps and attachments to be found complete)

Applicant Name: _____

Development Name: _____

Fee paid: _____ \$50.00 (land only) _____ \$100.00 (buildings & land)

_____ Notice provided by CEO to land owners within 500'

_____ Notice provided by CEO to municipality within 500' _____ Not applicable

Complete	Not Applicable	Waiver Request Approved	Application Submission
			Application form
			Applicant's agent authorization letter
			Copy of deed, option, sales agreement, lease or other documentation of title, right or interest
			Written waiver request
			Copy of tax map of property
			Copy of Kennebec Co. soil map of property
			Copy of USGS topographic map showing property location
			Copy of Belgrade Shoreland Zoning map showing property location
			Copy of Flood Insurance Map showing property
			Copy of National Wetlands Inventory Map showing property
			Copy of Maine Geological Survey Significant Sand and Gravel Aquifer map showing property location

Complete	Not Applicable	Waiver Request Approved	Application Submission
			Copy of Maine Drinking Water Program map of public drinking water supplies showing property location
			Copy of MDOT Highway Entrance or Access Permit
			Copy of MDOT Traffic Movement Permit & traffic movement study
			Copies of other required State or local permits
			1 24x36" Site Development Plan drawn to scale showing at minimum the following: scale, north arrow, parcel boundaries, location and dimensions of existing and proposed buildings and structures, drainage structures, signs, fencing, exterior lights, location and extent of disturbed area, layout and dimensions of impervious surfaces, parking, driveways, roads, outdoor storage areas of equipment/inventory/dumpsters/other materials, location of bulk storage of petroleum/hazardous substances ³ /propane, utilities, drainage ways, easements, rights of way, location of flood hazard areas/water courses/ water bodies/wetlands, Shoreland Zoning districts, location of existing vegetation to be retained, location of vegetated buffers/screening along public roads & property lines and around outdoor storage areas, landscaping, location of wells & source water protection area if public drinking water supply, location of soil test pits and subsurface waste water disposal system(s), other significant natural/physical features, name/address of owner/applicant, and name/address/license number/stamp of professional engineer/surveyor who prepared site plan.

³ Hazardous substances most likely encountered will be degreasers and other solvents used for parts cleaning in vehicle repair, waste oil and gasoline, waste antifreeze, solvents used in auto body shops, solvents used in dry cleaning, wood treatment chemicals, pesticides, and pool chemicals like chlorine.

Complete	Not Applicable	Waiver Requested & Approved	Application Submission
			Detail to-scale drawings showing location and construction specifications of drainage features, roads, sidewalks, access points, driveways, parking, traffic control features, fire control structures, and public improvements
			Documentation meets applicable State/Federal air quality regulatory requirements
			Soil erosion control plan (Art. 6, Sec. 3)
			MDEP certified contractor name/#
			Location of site/structure listed on National Register of Historic Places
			Location of Me. Historic Preservation Commission archeological sites
			Information needed to meet Air Quality standard (Article 6, Sec. 1)
			Information needed to meet Access to Public Streets standard (Article 6, Sec. 2)
			Protection measures for Historic and Archeological Resources (Art. 6, Sec.4)
			Estimated quantities of flammable, combustible and hazardous substances to be stored, handled, or generated, including waste oil and anti-freeze
			Evidence meets MDEP siting regulations for oil storage and hazardous substance facilities
			Copy of application provided to Fire Chief by Planning Board or CEO
			Other information needed to meet Material Storage standard, including bulk storage of combustible and flammable materials, and hazardous substances (Article 6, Sec. 5)
			Visual impact assessment
			Plan based on IF&W/Critical Areas Program recommendations to mitigate impact on Natural Areas and Wildlife Habitat, including deer wintering areas
			Other information needed to meet Natural Resource Protection standard (Art. 6, Sec. 6)

Complete	Not Applicable	Waiver Requested & Approved	Application Submission
			Is Board requiring post development noise monitoring and reporting plan? If not required, mark "Not Applicable". If required, mark "complete" upon receipt
			Information needed to meet Noise standard (Article 6, Sec. 7)
			Exterior lighting plan & specifications for lighting fixtures
			Is Board requiring post development light monitoring and reporting plan? If not required, mark "Not Applicable". If required, mark "complete" upon receipt.
			Information to meet Parking standard (Article 6, Sec.9)
			Written statement from Fire Chief on capacity of Fire Dept. to provide adequate protection
			Written statement from Sheriff's Dept. approving any proposed security measures
			Other information to meet Public Safety and Emergency Services standard (Article 6, Sec. 10)
			Information to meet Screening of Structures, Parking Lots, and Other Non-residential Uses standard (Article 6, Sec. 11)
			To scale profile(face-on) view of proposed signs
			Other information to meet Sign standard (Article 6, Sec. 12)
			Stormwater Management Plan
			Other information to meet Stormwater Management standard (Article 6, Sec. 13)
			Subsurface waste disposal site evaluation form (HHE-200)
			Other information to meet Wastes standard (Article 6, Sec. 14)
			Groundwater quality and quantity impact assessment
			Copy of deed restrictions related to drinking water and ground water protection

Complete	Not Applicable	Waiver Requested & Approved	Application Submission
			Copy of Maine Drinking Water Program public water supply approval & source water protection plan
			Copy of MDEP Stormwater Management Permit
			Phosphorous export control method
			Other information to meet Water Quality standard (Article 6, Sec. 15)
			Supplemental site plan requirements for mineral extraction operations
			5 year mining/reclamation plan
			Mineral extraction/processing operating procedure and hours
			Hydrogeological study of ground water movement & quality
			Written extraction/processing buffer agreement with abutter
			Reclamation Plan for extraction/processing operations
			Design/operation details of stationary petroleum storage and equipment fueling
			Other information to meet Mineral Extraction and Processing Operations standards (Article 7, Sec. 1)
			Information to meet Overnight Accommodations standard (Article 7, Sec. 2)
			Visual impact assessment of telecommunication tower if located on lake shore or hilltop
			Maine registered professional engineer certification of telecommunication tower design
			Other information to meet Telecommunications Tower standards (Article 7, Sec. 3)
			Visual impact assessment for wind turbine taller than 100'
			Impact study of wind turbine on wildlife
			Identification of roads to be used for turbine transport

Complete	Not Applicable	Waiver Requested & Approved	Application Submission
			Hiring of engineer by Town at applicant's expense to document road conditions prior to use and damage after use
			Emergency response plan during equipment transport
			Turbine general liability certificate of insurance

Printed Name Planning Board Chair or Designee

Chair or Designee Signature

Date

Attachment 2
Title, Right, or Interest

PURCHASE AND SALE AGREEMENT
Land Only

This Purchase and Sale Agreement by and between Steven M. Buchsbaum and Regina A. Coppens of 376 West Rd. Belgrade, Me 04917 (hereinafter called Purchaser) and James H. Parker and Joanne L. Parker of 243 Manchester Road Belgrade, Maine 04917 (hereinafter called Seller) witnesses that said Purchaser hereby agrees to purchase from Seller and Seller hereby agrees to sell to Purchaser, upon the terms and conditions set forth herein, the real estate at Route 135 in Belgrade ME, described in Book 11846, Page 23 and in Book 8139, Page 74 of the Kennebec County Registry of Deeds, with any buildings and improvements thereon. The parcel to be conveyed is further described on the plan attached hereto.

1. **Consideration.** The total consideration for this Agreement shall be [REDACTED]. Upon execution of this Agreement, Purchaser has made a deposit of [REDACTED] which deposit shall be nonrefundable except as otherwise provided herein. The remainder of the consideration shall be paid by a certified or cashier's check made payable to the order of Seller and delivered to Seller at the closing. In the event of a closing hereunder, the deposit shall be credited at closing to the consideration of Purchaser's behalf.
2. **Deed.** At closing Seller shall deliver to Purchaser or its agent a Warranty Deed conveying good and merchantable fee simple title to the property, free and clear of all encumbrances, in accordance with standards adopted by the Maine Bar Association. Seller agrees to execute and deliver such affidavits as may be reasonably required by Purchaser's title insurance company in order for such company to issue owner's and lender's title insurance policies, as applicable with all standard exceptions deleted, or as required by an attorney certifying title. The deed shall contain a restriction that no conveyances, with the exception of a leasehold, of less than the entire parcel shall be allowed for ten years from the date of closing and the restriction that no residential dwellings (not intended to include any buildings used for the management of the solar farm) be built on the premises for ten years from the date of the closing.
3. **Title Documents.** Seller is obligated at closing to remove or cause to be removed from title any mortgages or other voluntary liens securing the payment of monetary obligations of Seller. If Seller is unable to convey title in accordance with the provisions of paragraph 2, above, because of any other title defect then Seller shall have a reasonable time period, not to exceed thirty (30) days from the time the defect is discovered, unless otherwise agreed to by both parties to

1

- b. Seller is not aware of any judicial or administrative orders pertaining to the property.
 - c. The subject premises are not affected by covenants that would limit the use of the subject premises or significantly affect the value thereof.
 - d. The property is not situated, in whole or in part, in a flood zone within the meaning of the Flood Disaster Protection Act of 1973, as amended, or in the event the property is so situated, flood hazard insurance can be obtained.
 - e. No work has been done on the property for which the cost has not been paid.
 - f. No sales or brokerage commission is due to any party in connection with this transaction.
9. **Closing Adjustments.** Real property taxes and any other assessments or charges levied against the property including, without limitation, sewer and water charges, shall be prorated as of the closing. Real property taxes shall be prorated based on the fiscal year of the municipality. State of Maine transfer tax shall be paid by Purchaser and Seller as provided by law. Seller shall be responsible for preparation of the Deed and Transfer Tax Declaration. Legal fees and other closing costs incurred by Seller or Purchaser in connection with this transaction shall be paid for by the party incurring such costs.
10. **Default.** In the event Purchaser fails to fulfill any of Purchaser's obligations hereunder, then this Agreement shall terminate, the deposit shall be forfeited to Seller as liquidated damages and the parties shall be relieved of any further obligation to the other. In the event Seller fails to fulfill any of Seller's obligations hereunder, or Seller's inability to perform in accordance with the terms hereof, the deposit shall be returned to Purchaser and Purchaser shall have all available legal and equitable remedies.

11. **General Provisions.**

- a. This Agreement shall inure to the benefit of and be binding upon the heirs, personal representatives, successors, and assigns of Seller and the assigns of Purchaser.
- b. This Agreement constitutes the entire agreement between the parties, supersedes all prior negotiations and understandings between them, and shall not be altered or amended except by a written amendment signed by Seller and Purchaser.

3

remedy the defect. After such time, if such defect is not corrected so that there is a merchantable title, Purchaser, at its sole option, may elect to terminate this Agreement or Purchaser may affect such title as Seller can convey. Seller hereby agrees to make a good faith effort to cure any title defect during such period.

4. **Closing.** The closing shall take place at Levey, Wagley, Putman and Eccher or at another location mutually acceptable to the parties, not later than ninety (90) days from the effective date of this Agreement.
5. **Possession.** Seller shall deliver possession of the property to Purchaser at closing. Seller shall deliver the property in substantially the same condition as exists on the date hereof.
6. **Shoreland Property/Subsurface Waste Water Disposal.** Seller represents and warrants to Purchaser as of the date hereof, which representations and warranties shall be true on the closing date and shall survive the closing and passage of title to Purchaser, as follows:

☒ The property is not located in a shoreland area and/or is not served by a subsurface waste water disposal system.
7. **Underground Oil Storage Facilities.** Seller represents and warrants to Purchaser as of the date hereof, which representations and warranties shall be true on the closing date and shall survive the closing and passage of title to Purchaser, as follows:

☒ No underground storage facility for the storage of oil or petroleum products exists on the premises.
8. **Representations/Warranties.** Seller represents and warrants to Purchaser as of the date hereof, which representations and warranties shall be true on the closing date and shall survive the closing and passage of title to Purchaser, as follows:
 - a. Seller has no information or knowledge of any violation of any statute, law, ordinance, rule or regulation, including, but not limited to, any statute law, ordinance, rule or regulation relating to environmental protection, land use, zoning, building, health and fire, involving the property.

2

- c. This Agreement may be simultaneously executed in any number of counterparts, each of which when duly executed and delivered, including delivery by facsimile, shall be an original, but such counterparts shall constitute but one and the same agreement.
 - d. If any provision of this Agreement is found to be invalid or unenforceable, such finding shall not affect the validity or enforceability of any other provisions hereof.
 - e. This Agreement shall be construed and enforced in accordance with and governed by the laws of the State of Maine.
12. **Time for Acceptance/Effective Date.** This Agreement may be executed first by either Purchaser or Seller, in which case it shall constitute an offer to the other party. Such offer shall remain open for 5 days, after the date of the signature of the first party signing, and the other party may accept the offer only by delivering to the offering party, within said time limit, a duly executed counterpart of this Agreement. The effective date of this Agreement shall be the date of execution by the party last signing.

IN WITNESS WHEREOF, Purchaser and Seller have hereunto caused this Agreement to be executed.

PURCHASER:

Steven M. Buchsbaum
Steven M. Buchsbaum
And
Regina A. Coppens
Regina A. Coppens

Dated: 3-18-20

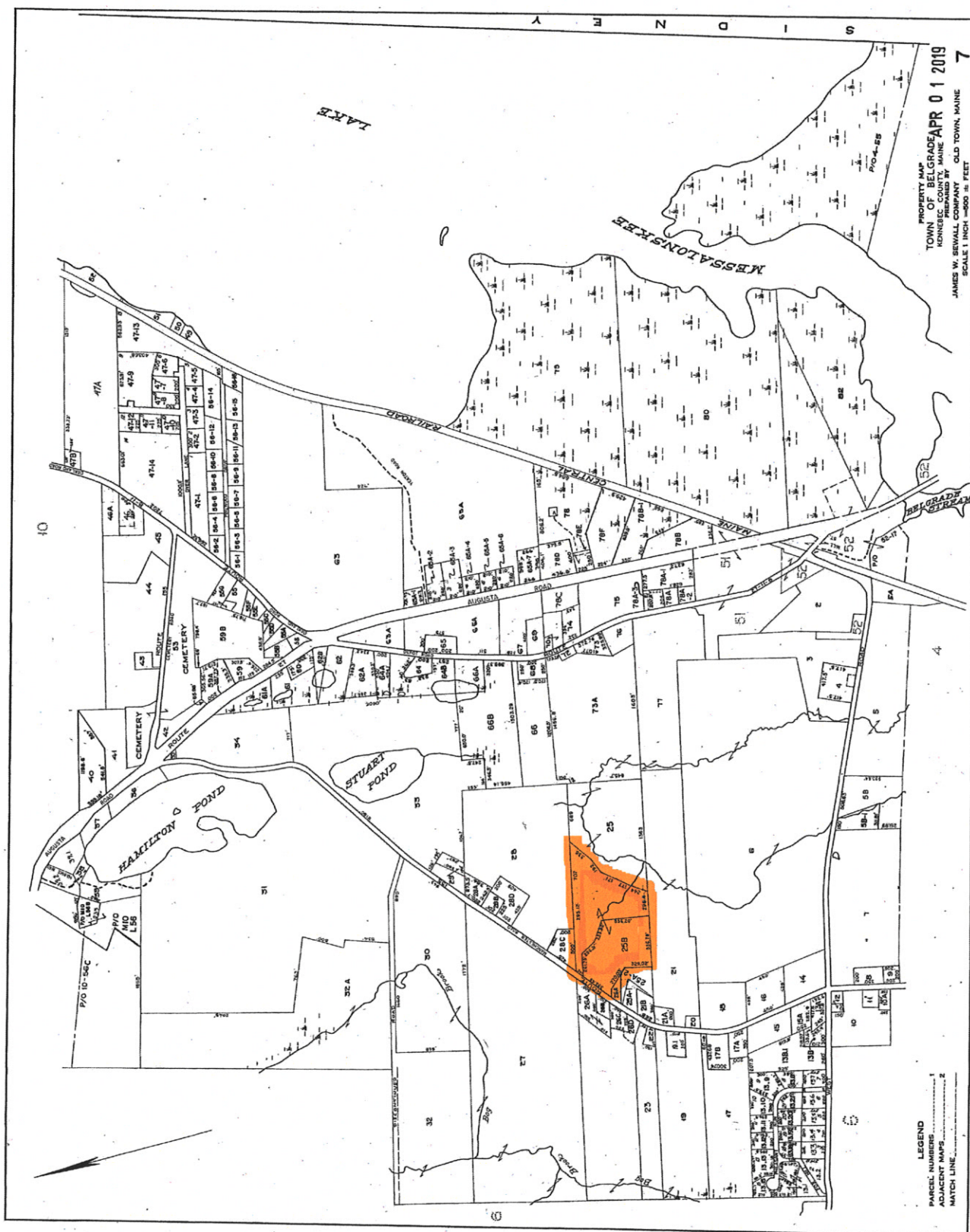
SELLER:

James H. Parker
James H. Parker
And
Joanne L. Parker
Joanne L. Parker

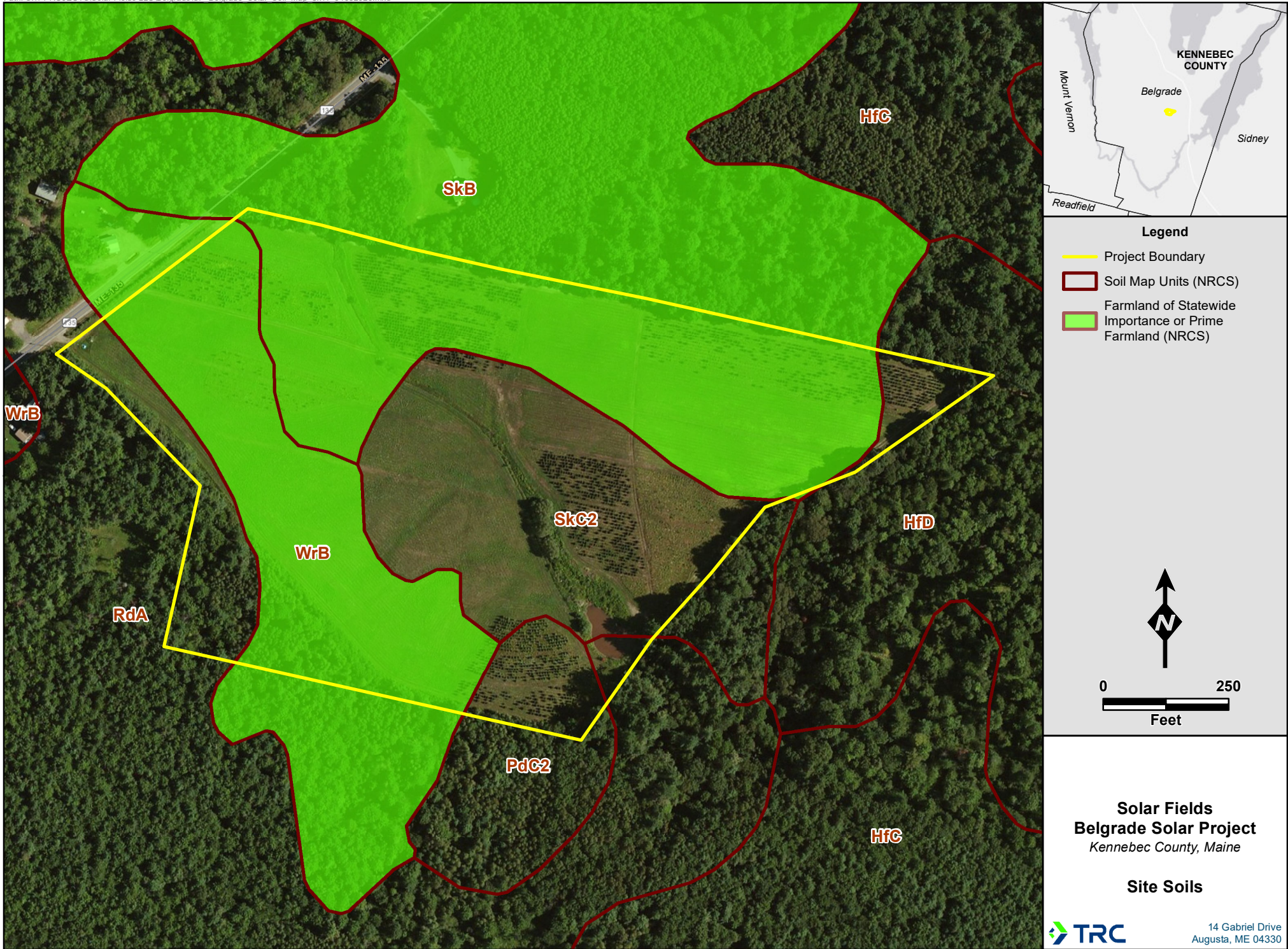
Dated: 3-18-20

4

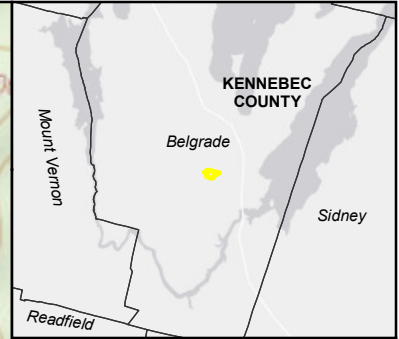
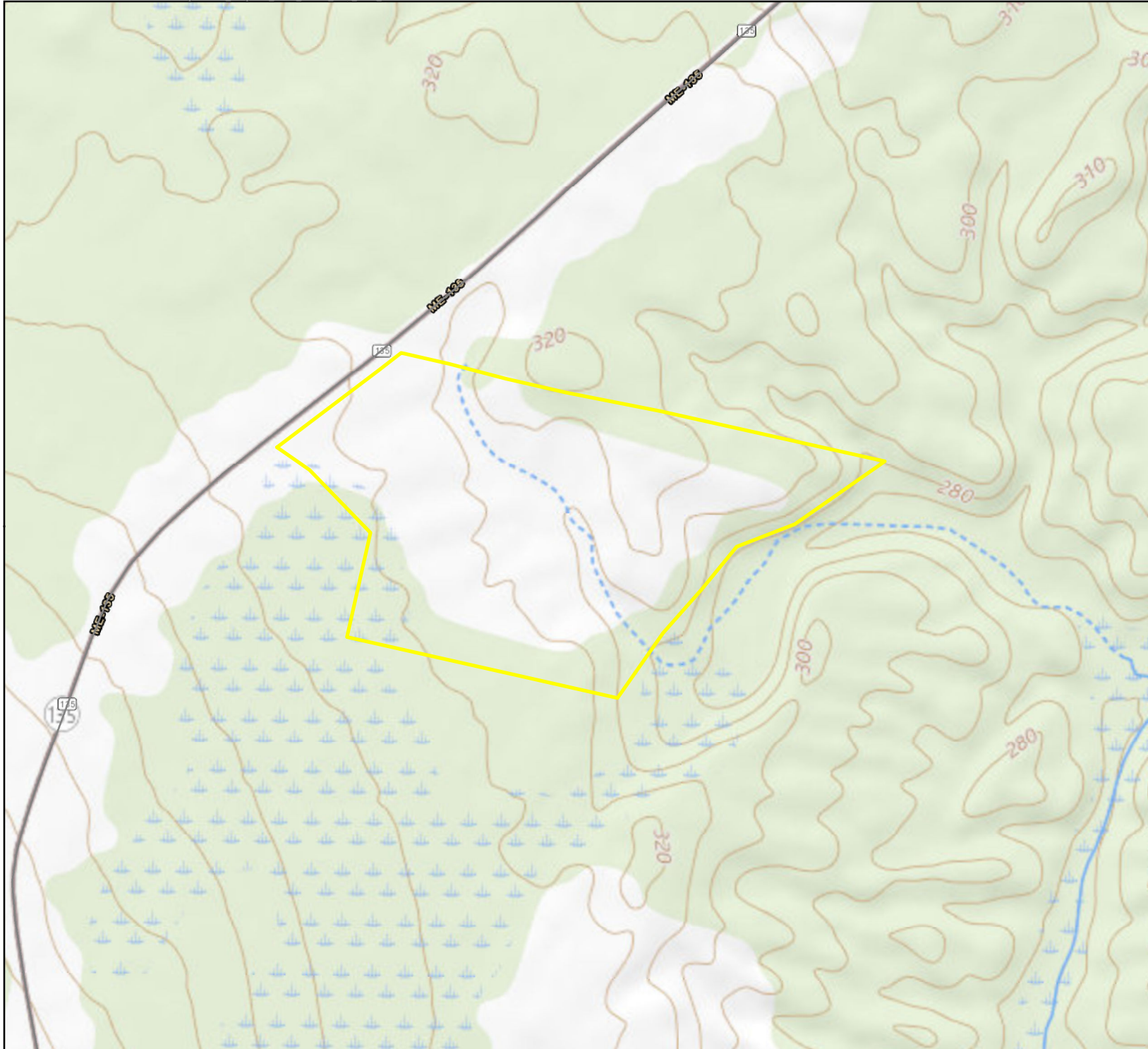
Attachment 2
Tax Map #7



Attachment 3
Kennebec County Soil Conservation Service Soils Map

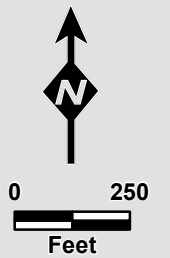


Attachment 4
USGS Topographic Map



Legend

— Project Boundary



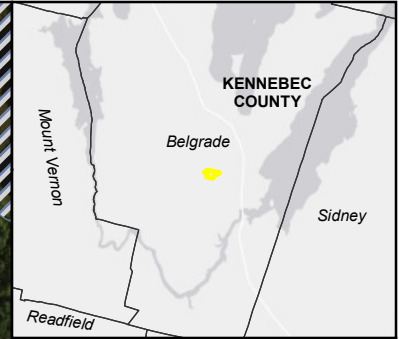
**Solar Fields
Belgrade Solar Project**
Kennebec County, Maine

Site Topography





14 Gabriel Drive
Augusta, ME 04330

Attachment 5
FEMA 100-Year floodplain Map



Legend

-  Project Boundary
-  100 Year Flood Zone (FEMA)



0 500
Feet

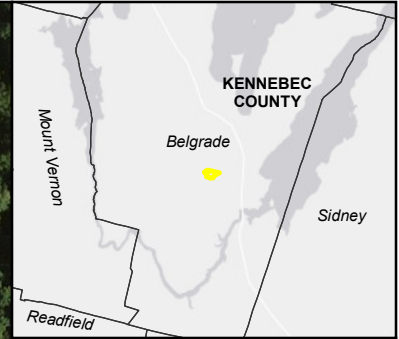
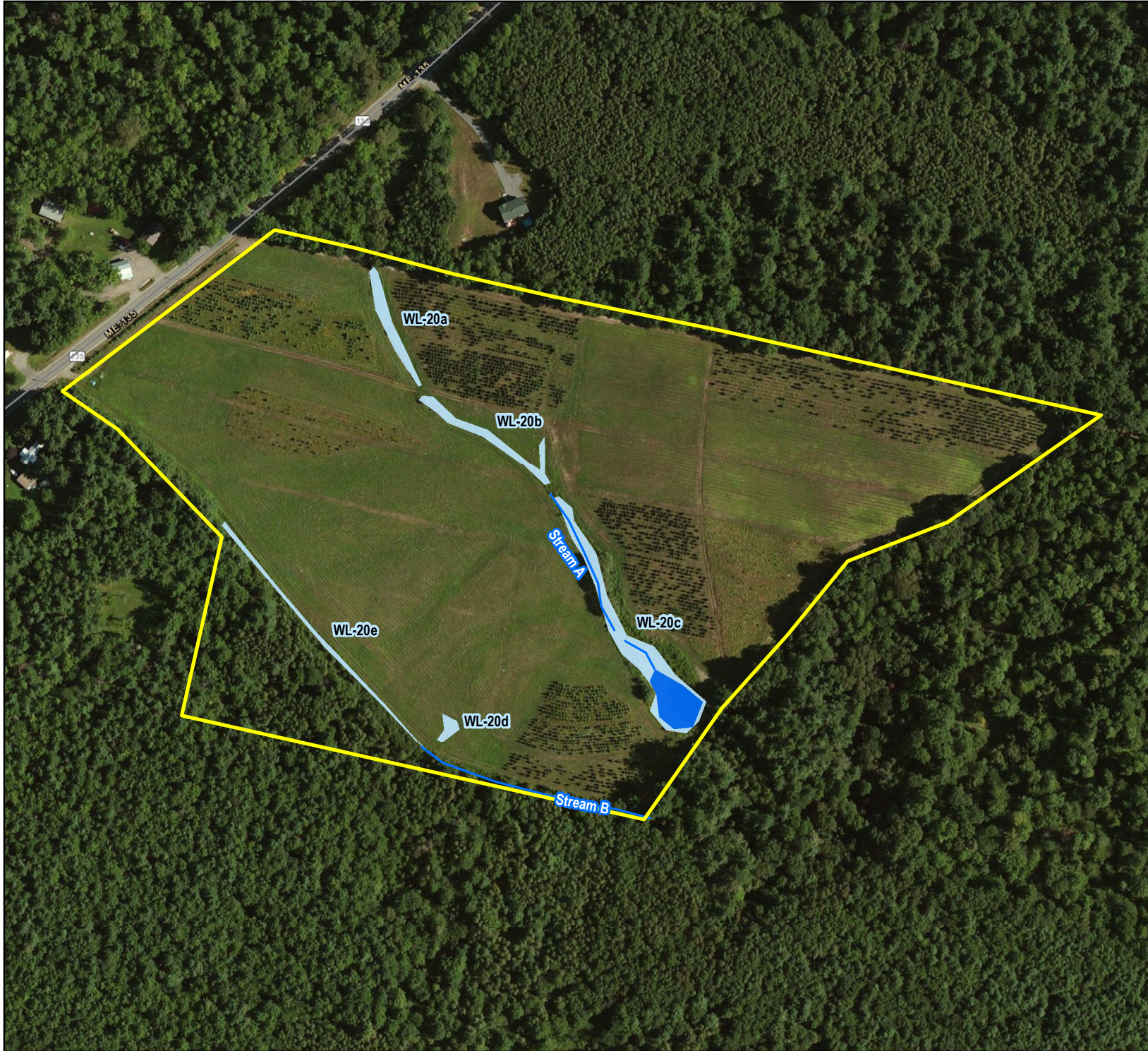
Solar Fields
Belgrade Solar Project
Kennebec County, Maine

100 Year Flood Zone



14 Gabriel Drive
Augusta, ME 04330

Attachment 6
Aerial Map with Protected Natural Resources



Legend

- Project Boundary
- Stream
- Open Water
- Wetland



0 250
Feet

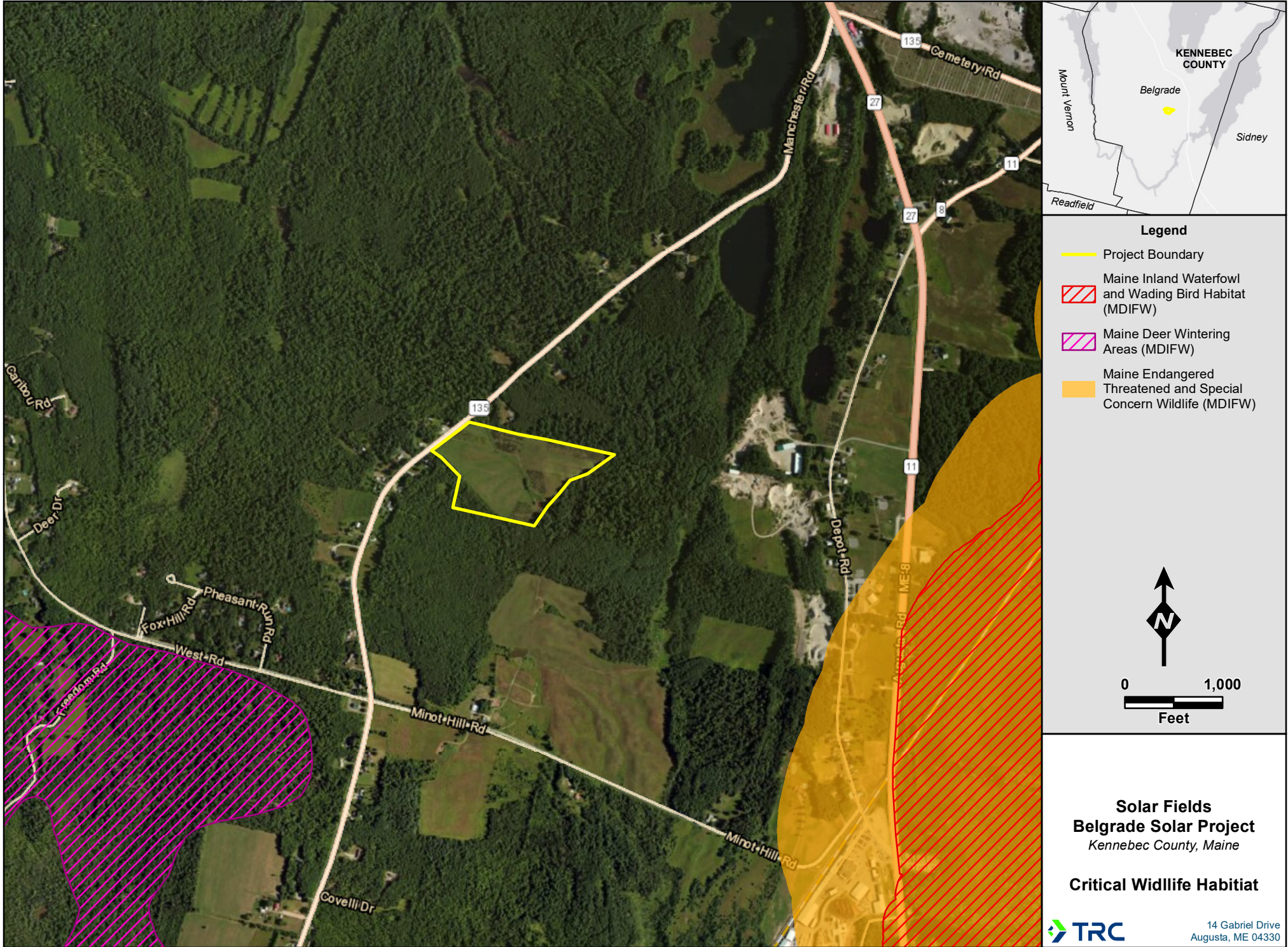
Solar Fields
Belgrade Solar Project
Kennebec County, Maine

Wetland Delineation



14 Gabriel Drive
Augusta, ME 04330

Attachment 7
MDIFW Significant Wildlife Habitat Map



Attachment 8
MDEP PBR Approvals & MDOT Permit Application



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Permit-by-Rule & Notice of Intent Review Form

Natural Resources Protection Act
Stormwater Management Law
Maine Construction General Permit

PBR # 69870

PBR #

NOI #

Applicant: Solar Fields LLC

Town: Belgrade

NRPA PBR Sections – Ch. 305

- | | | |
|--|--|---|
| <input checked="" type="checkbox"/> Sec. 2 Act. Adj. to Prot. Natural Res. | <input type="checkbox"/> Sec. 9 Utility Crossing | <input type="checkbox"/> Sec. 16 Coastal Sand Dune Project |
| <input type="checkbox"/> Sec. 3 Intake Pipes | <input type="checkbox"/> Sec. 10 Stream Crossing | <input type="checkbox"/> Sec. 17 Transfer/Permit Extension |
| <input type="checkbox"/> Sec. 4 Replacement of Structures | <input type="checkbox"/> Sec. 11 State Transport. Facilities | <input type="checkbox"/> Sec. 18 Maintenance Dredging |
| <input type="checkbox"/> Sec. 6 Movement of Rocks or Veg. | <input type="checkbox"/> Sec. 12 Restoration Natural Areas | <input type="checkbox"/> Sec. 19 Act. Near SVP Habitat |
| <input type="checkbox"/> Sec. 7 Outfall Pipes | <input type="checkbox"/> Sec. 13 F&W Creat./Water Quality | <input type="checkbox"/> Sec. 20 Act. Near Waterfowl/Bird Habitat |
| <input type="checkbox"/> Sec. 8 Shoreline Stabilization | <input type="checkbox"/> Sec. 15 Public Boat Ramps | |

Notes:

PBR Accepted as presented

Reviewer:

Reviewer: Cameron Dufour

Deficient Date:

Accepted Date: 5/11/2020

☐ NRPA ☐ SW ☐ NOI

☒ NRPA ☐ SW ☐ NOI

Rev. 5/1/2020



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Permit-by-Rule & Notice of Intent Review Form

Natural Resources Protection Act
Stormwater Management Law
Maine Construction General Permit

PBR #
PBR # 69867
NOI #

Applicant: Solar Fields LLC

Town: Belgrade

NRPA PBR Sections – Ch. 305

- | | | |
|---|--|---|
| <input type="checkbox"/> Sec. 2 Act. Adj. to Prot. Natural Res. | <input type="checkbox"/> Sec. 9 Utility Crossing | <input type="checkbox"/> Sec. 16 Coastal Sand Dune Project |
| <input type="checkbox"/> Sec. 3 Intake Pipes | <input type="checkbox"/> Sec. 10 Stream Crossing | <input type="checkbox"/> Sec. 17 Transfer/Permit Extension |
| <input type="checkbox"/> Sec. 4 Replacement of Structures | <input type="checkbox"/> Sec. 11 State Transport. Facilities | <input type="checkbox"/> Sec. 18 Maintenance Dredging |
| <input type="checkbox"/> Sec. 6 Movement of Rocks or Veg. | <input type="checkbox"/> Sec. 12 Restoration Natural Areas | <input type="checkbox"/> Sec. 19 Act. Near SVP Habitat |
| <input type="checkbox"/> Sec. 7 Outfall Pipes | <input type="checkbox"/> Sec. 13 F&W Creat./Water Quality | <input type="checkbox"/> Sec. 20 Act. Near Waterfowl/Bird Habitat |
| <input type="checkbox"/> Sec. 8 Shoreline Stabilization | <input type="checkbox"/> Sec. 15 Public Boat Ramps | |

Notes:

Storm Water PBR accepted as presented

Reviewer:

Reviewer: Cameron Dufour

Deficient Date:

Accepted Date: 5/11/2020

☐ NRPA ☐ SW ☐ NOI

☐ NRPA ☒ SW ☐ NOI

Rev. 5/1/2020



14 Gabriel Dr.
Augusta, ME 04330

T 207.620.3800
TRCcompanies.com

April 28, 2020

Lisa Pester
MDOT – Region 2
66 Industrial Drive
Augusta, ME 04330

Sent Via Email: Lisa.Pester@maine.gov

RE: MDOT Driveway Permit Application – Solar Fields, LLC | Parker Station - Belgrade, ME

Ms. Pester,

TRC, on behalf of Solar Fields, LLC, has prepared the enclosed MDOT Driveway Permit Application to access a ground-mount solar array (the Project) planned for construction on lands of Steven Buchsbaum located off Maine State Route 135 – Manchester Road in Belgrade, Maine. The subject parcel is identified by the Town of Belgrade Tax Assessor's Office as Lot 25B on Tax Map 7 with physical address of approximately 242 Manchester Road and is described in a deed recorded in the Kennebec County Registry of Deeds in Book 11846 Page 23 and Book 8139 Page 74. Due to COVID-19 restrictions, closing on the property and recording of a new deed reflecting the sale have been delayed however transfer of the property is under an executed purchase and sale agreement. Copies of the tax map, and purchase and sale agreement for the parcel are attached. The Project intends to upgrade an existing point of access onto ME-135 that has historically been used for agricultural purposes. The upgraded access will be a low-use gravel drive approximately 16 feet wide with the width at the intersection of approximately 22 feet. Once constructed, the Project will generate very low traffic by periodic maintenance staff. Average daily trips at the proposed upgraded driveway location will be less than 2 trips per day.

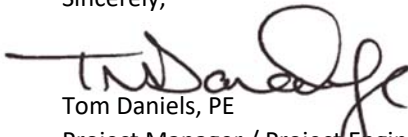
Review of the *Chapter 299: Highway Driveway and Entrance Rules* indicates that ME-135 is considered a Minor Collector and therefore the Basic Safety Standards of Section 2.1 apply. Posted Speed limit for the section of ME-135 where the Project is proposed is 45 mph. As shown on **Figure 1** attached, the planned driveway location consists of upgrading and slightly realigning the driveway location to be perpendicular to ME-135, a new 15-inch diameter culvert will be installed and roadside ditching will be re-established 25-feet on either end of the culvert to maintain drainage along ME-135. The profile of the proposed access road will be constructed to match into existing grade and will extend approximately 650 feet into the property where a 96' diameter turning circle will be constructed to allow a full turning movement of the largest vehicle anticipated to access the property (40' fire apparatus in emergency situations). The proposed location of access will provide sufficient sight distance and is aligned directly across from an existing driveway that serves multiple existing structures.

If you have any questions regarding this request, please do not hesitate to contact me at 207.620.3757 or tdaniels@trccompanies.com.

Enclosed:

- Application for Driveway/Entrance Permit
- Figure 1 – Proposed Driveway Location Plan
- Town of Belgrade Tax Map 7
- Purchase & Sale Agreement
- Photos from Proposed Driveway Location

Sincerely,

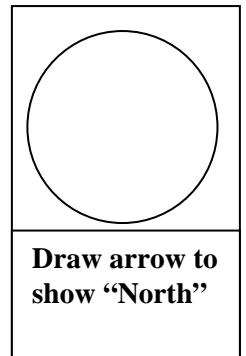

Tom Daniels, PE
Project Manager / Project Engineer

cc: Steven Buchsbaum-Solar Fields, LLC, Mark Christopher - TRC

Site Sketch or attach Site Plan

THE OWNER HEREBY AGREES

- 1) Provide, erect and maintain all necessary barricades, lights, warning signs and other devices to direct traffic safely while the work is in progress.
- 2) **At no time cause the highway to be closed to traffic.**
- 3) Where the drive/entrance is located within a curb, curb and gutter, and/or sidewalk section, completely remove the existing curb, curb and gutter, and/or sidewalk as may be required to create the drive/entrance and restore drainage. All driveways/entrances abutting sidewalk sections shall meet the requirements set forth in the Americans with Disabilities Act of 1990, 42 U.S.C. §§ 12132 et seq.
- 4) **Obtain, deliver to site and install any culverts and/or drainage structures necessary for drainage; the size, type and length of such culverts or structures shall be as specified in the permit pursuant to 23 M.R.S.A. § 705. All culverts and/or drainage structures shall be new.**
- 5) Complete construction of proposed driveway/entrance within twelve months of commencement of construction.
- 6) **COMPLY WITH ALL FEDERAL, STATE AND MUNICIPAL LAWS AND ORDINANCES.**
- 7) Not alter, without the express written consent of the MDOT, any culverts, drainage patterns or swales within MDOT right-of-way.
- 8) **File a copy of the approved driveway/entrance permit with the affected municipality or LURC, as appropriate, within 5 business days of receiving the MDOT approval.**
- 9) Shall construct and maintain the entrance side slopes to be no steeper than the adjacent roadway side slopes, but in no case to be steeper than 3 horizontal to 1 vertical, unless the side slope is behind existing roadway guardrail, in which case it shall be no steeper than 2 horizontal to 1 vertical.
- 10) **Notify the MeDOT(in writing) of a proposed change to use served by driveway/entrance when increase in traffic flow is expected to occur. This does not exempt the need for obtaining a Traffic Movement Permit (TMP) if trip generation meets or exceeds 100 passenger car equivalents (pce) during the peak hour of the day.**



FURTHER CONDITION OF THE PERMIT:

The owner shall assume the defense of, and pay all damages, fines, and penalties for which he/she shall become liable, and shall indemnify and safe harmless said Department, its representatives, agents and employees from liability, actions against all suite, claims, damages for wrongful death, personal injuries or property damage suffered by any person or association which results from the willful or negligent action or inaction of the owner/applicant/agent and in proceedings of every kind arising out of the construction and maintenance of said entrance(s), including snow removal. Nothing herein shall, nor is intended to, waive and defense, immunity or limitation of liability which may be available to the MDOT, their officers, agents or employees under the Maine Tort Claims Act or any other privileges and/or immunities provided by law.

The submission of false or misleading statements on or with this application, or the omission of information necessary to prevent statements submitted herein or herewith from being misleading, is a crime punishable under Chapter 19 of the Maine Criminal Code, and any permit issued in reliance thereon will be considered null and void without notice or further action by the Department.

Date Filed: April 28, 2020

Steven Buchsbaum

Signature of Owner

Signature of Applicant _____

☐ By signing and checking this box I hereby certify that I have been granted permission from the property owner to act in their behalf.

Client Name: *Solar Fields LLC - Parker Station*

Project No. 389694

Photo No. 1

Date: **2020.04.28**

Site Location:
**Manchester Rd,
Belgrade, ME**

Description:

View of existing driveway
Location to be upgraded
for change of use.



Photo No. 2

Date: **2020.04.28**

Site Location:
**Manchester Rd,
Belgrade, ME**

Description:

View across from existing
driveway.



Client Name: *Solar Fields LLC – Parker Station*

Project No. 389694

Photo No. 3

Date: 2020.04.28

Site Location:

Manchester Rd,
Belgrade, ME

Description:

View from driveway
looking South.



Photo No. 4

Date: 2020.04.28

Site Location:

Manchester Rd,
Belgrade, ME

Description:

View from driveway
looked North.



Attachment 9
Civil Design and Solar Array Design Includes Erosion Control Plan (11x17")

[illegible]

14 Gabriel Drive
Augusta, ME 04330
Phone: 207.620.3800
www.trcsolutions.com

2438 --USER: Tdaniel --ATTACHED:RFPES - Maine office & Town boundaries -- ATTACHED:IMAGES - DigSafe, 1020705512
DRAWING NAME: \\augusta-bp1\Environmental\RMDEV\RD Projects\Solar Fields\389694 - Solar Fields Belgrade, ME\10-DWG\389694-G-SHEETS.dwg -- PLOT DATE: May 12, 2020 - 4:25PM -- LAYOUT: G-2
Version: 2017-10-21

GENERAL NOTES

- THE PROJECT HORIZONTAL COORDINATES SYSTEM IS BASED ON NAD83 MAINE STATE PLANE (US SURVEY FEET, WESTERN ZONE, ME83-WF). ELEVATIONS ARE BASED ON NAVD88 (US SURVEY FEET).
- TOPOGRAPHIC SURVEY INFORMATION DATA IS COMPILED FROM AERIAL MAPPING (LIDAR) PROVIDED BY THE MAINE OFFICE OF GIS AND SHOULD BE CONSIDERED TO BE APPROXIMATE.
- PROJECT PROPERTY BOUNDARIES ARE BASED ON INFORMATION PROVIDED IN A SURVEY PLAN BY GARBACICK SURVEYORS OF AUGUSTA, ME AS WELL AS TOWN OF BELGRADE TAX MAPS.
- EXISTING UTILITIES ARE APPROXIMATE AND SHOULD BE VERIFIED BY CONTRACTOR. DIGSAFE SHALL BE NOTIFIED A MINIMUM OF 72-HOURS PRIOR TO COMMENCING ANY EXCAVATION.
- THIS IS A PRELIMINARY DESIGN PLAN. FINAL DESIGN SHALL BE MODIFIED BY CONTRACTOR TO MATCH FINAL ELECTRICAL INTERCONNECTION STUDIES, EQUIPMENT PURCHASED, AND POSSIBLE PERMIT CONSTRAINTS REVEALED DURING PROJECT'S REVIEW.
- ALL WORK DETAILED ON THESE PLANS AND PERFORMED UNDER THIS CONTRACT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, THE PROJECT GEOTECHNICAL REPORT, AND ANY OTHER APPLICABLE TECHNICAL REPORTS. WHERE INDICATED, STATE AND/OR LOCAL STANDARD SPECIFICATIONS SHALL APPLY.
- THE CONTRACTOR SHALL ABIDE BY ALL LOCAL, STATE, AND FEDERAL LAWS, RULES AND REGULATIONS WHICH APPLY TO THE CONSTRUCTION OF THESE IMPROVEMENTS, INCLUDING STATE AND FEDERAL REQUIREMENTS WITH RESPECT TO STORMWATER DISCHARGE.
- THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITY LINES WITHIN OR ADJACENT TO THE CONSTRUCTION AREA. ANY DAMAGE TO EXISTING FACILITIES CAUSED BY CONSTRUCTION ACTIVITY SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.
- CONSTRUCTION SHALL NOT OCCUR IN ANY PUBLIC RIGHTS OF WAY, PUBLIC OR PRIVATE EASEMENTS, BEYOND THE LIMITS OF DISTURBANCE, OR OUTSIDE THE PROPERTY LIMITS WITHOUT NECESSARY PERMITS. ANY PUBLIC OR PRIVATE PROPERTY OR IMPROVEMENTS DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED TO THE SATISFACTION OF THE OWNER AT THE COST OF THE CONTRACTOR.
- OVERNIGHT PARKING OF CONSTRUCTION EQUIPMENT SHALL NOT OBSTRUCT DRIVEWAYS OR DESIGNATED TRAFFIC LANES. THE CONTRACTOR SHALL NOT STORE ANY EQUIPMENT OR MATERIAL WITHIN THE PUBLIC RIGHT OF WAY. OVERNIGHT PARKING OF CONSTRUCTION VEHICLES ON PRIVATE PROPERTY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- ALL PROPERTY CORNERS OR MONUMENTS DESTROYED DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. ALL PROPERTY CORNERS MUST BE RESET BY A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF MAINE.
- CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS CONTROLLING THE POLLUTION OF THE ENVIRONMENT.
- CONTRACTOR TO ENSURE ALL WORK PERFORMED IS IN ACCORDANCE WITH EXISTING PROJECT PERMITS, STUDIES, AND REPORTS PROVIDED IN THE CONTRACT DOCUMENTS INCLUDING STATE STORMWATER MANAGEMENT PERMIT AND LOCAL ORDINANCE.
- IT IS THE INTENT OF THESE PLANS THAT THE CONTRACTOR SHALL NOT PERFORM ANY WORK OUTSIDE THE IDENTIFIED PROJECT BOUNDARIES AND CLEARING LIMITS.
- IT IS THE INTENT OF THESE PLANS THAT THE CONTRACTOR AVOID "FILLING" WETLANDS AT ALL COSTS. CONTRACTOR TO AVOID THE DELINEATED WETLAND AREAS AND NATURAL RESOURCES ONSITE.
- WHENEVER PRACTICABLE, NO DISTURBANCE ACTIVITIES SHOULD TAKE PLACE WITHIN 50 FEET OF ANY PROTECTED NATURAL RESOURCE. IF DISTURBANCE ACTIVITIES SHOULD TAKE PLACE UPGRADIENT TO AND BETWEEN 30 FEET AND 50 FEET OF ANY PROTECTED NATURAL RESOURCE, PERIMETER EROSION CONTROLS MUST BE DOUBLED. IF DISTURBANCE ACTIVITIES TAKE PLACE UPGRADIENT TO AND LESS THAN 30 FEET FROM ANY PROTECTED NATURAL RESOURCE, PERIMETER EROSION CONTROLS MUST BE DOUBLED AND DISTURBED AREAS MUST BE TEMPORARILY OR PERMANENTLY STABILIZED WITHIN 7 DAYS. ALL AREAS WITHIN 75 FEET OF A PROTECTED NATURAL RESOURCE MUST BE PROTECTED WITH A DOUBLE ROW OF SEDIMENT BARRIERS NOVEMBER 1 THROUGH APRIL 15.
- CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THE PROJECT.
- CONTRACTOR SHALL FIELD FIT ALL PROPOSED CULVERT INVERTS TO PROVIDE POSITIVE DRAINAGE IN THE DIRECTION OF EXISTING SLOPES. ALL CULVERTS TO BE INSTALLED AT ADEQUATE DEPTHS AND TO DAYLIGHT. INLETS AND OUTLETS OF ALL CULVERTS TO BE STABILIZED WITH RIP RAP IN ACCORDANCE WITH THE SITE GRADING & DRAINAGE PLAN.
- EXISTING ACCESS ROADS TO BE MAINTAINED SHALL BE PROOF ROLLED, SMOOTHED, AND RESURFACED AS NECESSARY TO PROVIDE AN ACCEPTABLE SURFACE.
- THE CONTRACTOR SHALL SECURE PERMITS FROM THE STATE AND TOWN OF BELGRADE AS NECESSARY BEFORE DRIVING CONSTRUCTION EQUIPMENT OVER AND ACROSS STATE AND TOWN MAINTAINED ROADS.
- ALL WORK IN THE PUBLIC RIGHTS OF WAY SHALL CONFORM WITH THE MAINE DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS".
- WETLANDS AND NATURAL RESOURCES WERE DELINEATED BY BURMAN LAND & TREE COMPANY, LLC IN APRIL OF 2020.

HOUSEKEEPING NOTES

CONTRACTOR SHALL MAINTAIN THE PROJECT SITE IN ACCORDANCE WITH THE FOLLOWING PERFORMANCE STANDARDS:

- ~~SPILL PREVENTION:~~** CONTROLS SHALL BE IN PLACE TO PREVENT POLLUTANTS FROM BEING DISCHARGED FROM MATERIALS USED AND STORED ONSITE. APPROPRIATE CONTROLS INCLUDE, BUT ARE NOT LIMITED TO, PROPER STORAGE PRACTICES THAT MINIMIZE EXPOSURE OF MATERIALS TO STORMWATER, AND APPROPRIATE SPILL PREVENTION, CONTAINMENT, AND RESPONSE PLANNING AND IMPLEMENTATION.
- ~~GROUNDWATER PROTECTION:~~** DURING CONSTRUCTION, THE CONTRACTOR MAY NOT STORE OR HANDLE LIQUID PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS WITH THE POTENTIAL TO CONTAMINATE GROUNDWATER IN AREAS OF THE PROJECT SITES DRAINING TO AN INFILTRATION AREA OR WITHIN 100 FEET OF A CRITICAL RESOURCE AREA OR STREAM, DIKES, BERMS, SUMPS, AND OTHERS OF SECONDARY CONTAINMENT THAT PREVENT DISCHARGE TO GROUNDWATER MAY BE USED TO ISOLATE PORTIONS OF THE SITE FOR THE PURPOSES OF STORING AND HANDLING LIQUID HAZARDOUS MATERIALS.
- ~~FUGITIVE SEDIMENT AND DUST:~~** CONTRACTOR SHALL TAKE ALL NECESSARY ACTIONS TO ENSURE THAT ACTIVITIES DO NOT RESULT IN NOTICEABLE EROSION OF SOILS OR FUGITIVE DUST EMISSIONS DURING OR AFTER CONSTRUCTION. OPERATIONS DURING DRY MONTHS, THAT EXPERIENCE FUGITIVE DUST PROBLEMS, SHOULD WET DOWN UNPAVED ACCESS ROADS ONCE A WEEK OR MORE FREQUENTLY AS NEEDED WITH A WATER ADDITIVE. OIL MAY NOT BE USED FOR DUST CONTROL. CONTRACTOR SHALL MONITOR VEHICLES ENTERING AND EXITING THE PROJECT SITE FOR EVIDENCE OF TRACKING MUD ONTO PUBLIC OR PRIVATE ROADWAYS OUTSIDE THE WORK AREA. IF NECESSARY, CONTRACTOR SHALL PROVIDE MEANS FOR SWEEPING AND CLEANING ROAD AREAS EXPERIENCING TRACKING. IF OFF-SITE TRACKING OCCURS ON PUBLIC ROADS, THEY SHOULD BE SWEEP IMMEDIATELY AND NO LESS THAN ONCE A WEEK AND PRIOR TO SIGNIFICANT STORM EVENTS. DURING THE MUD SEASON IT MAY BE NECESSARY TO INCREASE THE SIZE OF STABILIZED CONSTRUCTION ENTRANCES OR PROVIDE A WHEEL WASHING STATION.
- ~~DEBRIS AND OTHER MATERIALS:~~** CONTRACTOR SHALL MANAGE ALL LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORMWATER TO PREVENT MATERIALS FROM BECOMING A SOURCE OF POLLUTION. CONTRACTOR SHALL MINIMIZE THE EXPOSURE OF CONSTRUCTION DEBRIS, BUILDING AND LANDSCAPING MATERIALS TO PRECIPITATION AND STORMWATER RUNOFF. THESE MATERIALS MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.
- ~~TRENCH OR FOUNDATION DEWATERING:~~** TRENCH DEWATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, COFFER DAMS, PONDS, SUMPS, BASINS, AND OTHER AREAS WITHIN THE CONSTRUCTION AREA THAT RETAIN WATER AFTER EXCAVATION. IN MOST CASES THE COLLECTED WATER IS HEAVILY SILTED AND HINDERS CORRECT AND SAFE CONSTRUCTION PRACTICES. THE CONTRACTOR SHALL REMOVE COLLECTED WATER FROM THE PONDED AREAS, EITHER THROUGH GRAVITY OR PUMPING, IN A MANNER THAT SPREADS IT THROUGH NATURAL WOODED BUFFERS OR TO AREAS THAT ARE SPECIFICALLY DESIGNED TO COLLECT THE MAXIMUM AMOUNT OF SEDIMENT POSSIBLE (E.G. COFFERDAM SEDIMENT BASIN). THE CONTRACTOR SHALL AVOID PRACTICES THAT ALLOW SEDIMENT LADEN WATER FROM DEWATERING TO FLOW OVER DISTURBED AREAS OF THE PROJECT SITES. OTHER MEASURES OR METHODS MAY BE UTILIZED AS REVIEWED AND APPROVED BY THE ENGINEER AND, IF NECESSARY, THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION.
- ~~AUTHORIZED NON-STORMWATER DISCHARGES:~~** THE CONTRACTOR SHALL IDENTIFY AND PREVENT CONTAMINATION BY NON-STORMWATER DISCHARGES. WHERE ALLOWED NON-STORMWATER DISCHARGES EXIST, THEY MUST BE IDENTIFIED AND STEPS SHALL BE TAKEN TO ENSURE IMPLEMENTATION OF APPROPRIATE POLLUTION PREVENTION MEASURES FOR THE NON-STORMWATER COMPONENTS OF THE DISCHARGE. AUTHORIZED NON-STORMWATER DISCHARGES ARE: DISCHARGES FROM FIREFIGHTING ACTIVITY, FIRE HYDRANT FLUSHING, VEHICLE WASHING IF DETERGENTS ARE NOT USED AND WASHING IS LIMITED TO THE EXTERIOR OF VEHICLES, DUST CONTROL RUNOFF IN ACCORDANCE WITH PERMIT CONDITIONS AND APPENDIX C(3) OF CHAPTER 500, ROUTINE EXTERNAL BUILDING WASHDOWN (EXCLUDING PAINT REMOVAL AND USE OF DETERGENTS), PAVEMENT WASHWATER (EXCLUDING AREAS OF SPILLS OR LEAKS OF TOXIC/HAZARDOUS MATERIALS AND USE OF DETERGENTS), UNCONTAMINATED AIR CONDITIONING OR COMPRESSOR CONDENSATE, UNCONTAMINATED GROUNDWATER OR SPRING WATER, FOUNDATION OR FOOTING DRAIN-WATER WHERE FLOWS ARE NOT CONTAMINATED, UNCONTAMINATED EXCAVATION DEWATERING PER APPENDIX C(5) OF CHAPTER 500, POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHING, AND LANDSCAPE IRRIGATION.
- ~~UNAUTHORIZED NON-STORMWATER DISCHARGES:~~** THE CONTRACTOR SHALL IDENTIFY AND PREVENT CONTAMINATION BY UNAUTHORIZED NON-STORMWATER DISCHARGES. UNAUTHORIZED STORMWATER DISCHARGES INCLUDE, BUT ARE NOT LIMITED TO, WASTEWATER FROM CONCRETE WASHOUT, FUELS OR HAZARDOUS SUBSTANCES, AND DETERGENTS USED IN VEHICLE AND EQUIPMENT WASHING.
- ~~ADDITIONAL REQUIREMENTS:~~** COMPLETION OF THE WORK WILL REQUIRE FREQUENT ACCESS TO VARIOUS PORTIONS OF THE PROJECT AREA FROM STATE AND LOCAL ROADWAYS. CONTRACTOR SHALL MONITOR PUBLIC ROADWAYS AND SHALL CLEAN PAVEMENT BY MEANS NECESSARY IN THE EVENT THAT SEDIMENT OR TRACKING IS OBSERVED. SIGNAGE SHALL BE POSTED AT INTERSECTIONS OF PROJECT ACCESS ROADS AND PUBLIC WAYS, STATING COMPANY NAME AND 24-HOUR CONTACT PHONE NUMBER.

LEGEND

	SUBJECT PROPERTY BOUNDARY
	APPROXIMATE ABUTTING PROPERTY BOUNDARY
	APPROXIMATE RIGHT-OF-WAY
	EXISTING UNPAVED ROAD
	EXISTING FENCE
	EXISTING WATERLINE
	EXISTING BUILDING
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	EXISTING SPOT ELEVATION
	EXISTING TREES AND/OR BRUSH
	DELINEATED WETLAND
	EXISTING POND
	DELINEATED STREAM
	NON-JURISDICTIONAL DRAINAGE
	LIMIT OF FEMA 100YR 24HR FLOOD ZONE
	EXISTING CULVERT
	EXISTING OVERHEAD ELECTRIC
	EXISTING UTILITY POLE
	LIMITS OF DISTURBANCE
	PROPOSED CULVERT
	PROPOSED ACCESS ROAD
	PROPOSED MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED TREE LINE
	PROPOSED CHAIN LINK FENCE
	NRCS SOILS DATA
	PROPOSED SILT FENCE
	PROPOSED OVERHEAD ELECTRIC LINE AND POLE
	75' STREAM BUFFER
	25' STREAM BUFFER
	VEGETATED WATER QUALITY BUFFER

ZONING REQUIREMENTS

DIMENSIONAL STANDARDS							
DISTRICT	MIN. FRONT YARD SETBACK		MIN. SIDE YARD SETBACK		MIN. REAR YARD SETBACK		BUILDING MAX. HEIGHT
	REQUIRED	PROVIDED	REQUIRED	PROVIDED	REQUIRED	PROVIDED	
NONE	NA	118'	NA	27'	NA	83'	NA
							20'

SITE SPECIFIC SOILS TABLE

ID	NAME	SLOPE RANGE	TEXTURE	HYDROLOGIC SOIL GROUP
H1C	HARTLAND	8 - 15%	SANDY LOAM	B
H1D	HARTLAND	15 - 25%	SANDY LOAM	B
P1C2	PACTION-CHARLTON	8 - 15%	SANDY LOAM	C/D
R1A	RIDGEBURY	0 - 5%	SANDY LOAM	C/D
SK1	SCIO	3 - 8%	SANDY LOAM	C
SK2	SCIO	8 - 15%	SANDY LOAM	C
WB	WOODBIDGE	3 - 8%	SANDY LOAM	C/D

PROJECT SCHEDULE

SPECIFICS OF HOW WORK IS TO BE COMPLETED SHALL ALSO BE BASED ON ENVIRONMENTAL CONSIDERATIONS ASSOCIATED WITH SEASONAL CHANGES. THE FOLLOWING DATES ARE PROVIDED TO ESTABLISH A GENERAL GUIDELINE FOR THESE SEASONS:

- WINTER: NOVEMBER 1 TO MARCH 19
- MUD SEASON: MARCH 20 TO APRIL 30
- SPRING: MAY 1 TO JUNE 21
- SUMMER: JUNE 22 TO SEPTEMBER 21
- FALL: SEPTEMBER 22 TO OCTOBER 31

FERTILIZER AND LIMESTONE REQUIREMENTS

IN GENERAL, FERTILIZER AND LIME APPLICATION RATES WILL FOLLOW THE GUIDELINES IDENTIFIED BELOW UNLESS SITE SPECIFIC SOIL TESTS IDENTIFY THE NEED FOR ALTERNATIVE FERTILIZER/LIME APPLICATION RATES. FERTILIZER WILL BE APPLIED TO UPLAND AREAS PRIOR TO SEEDING AT A RATE OF 800 POUNDS PER ACRE USING 10-0-0 (N-P205-K20) OR EQUIVALENT. GROUND LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) WILL BE APPLIED AT A RATE OF 3 TONS PER ACRE. AN EQUIVALENT MIXTURE OF FERTILIZER AND LIME MAY BE APPLIED USING THE HYDROSEEDING METHOD. NO LIME OR FERTILIZER WILL BE APPLIED TO WETLANDS.

MULCH ANCHORING REQUIREMENTS

ON SLOPES GREATER THAN 3 PERCENT, STRAW MULCH WILL BE FIRMLY ANCHORED INTO THE SOIL UTILIZING ONE OF THE FOLLOWING METHODS:
- CRIMPING WITH A STRAIGHT OR NOTCHED MULCH CRIMPING TOOL (FARM DISCS WILL NOT BE ALLOWED);
- TRACK WALKING WITH DEEP-CLEATED EQUIPMENT OPERATING UP AND DOWN THE SLOPE (MULCH CRIMPED PERPENDICULAR TO THE SLOPE) ON SLOPES >25 PERCENT;
- APPLICATION OF MULCH NETTING;
- APPLICATION OF 500 LB./ACRE OF WOOD FIBER MULCH OVER STRAW/HAY MULCH; AND
- COMMERCIALLY AVAILABLE TACKIFIERS (EXCEPT WITHIN 100 FEET OF WATERBODIES OR WETLANDS).

PHOSPHORUS CONTROL PLAN NOTES

LAKE WATERSHED, MESSALONSKEE LAKE
WATERSHED PER ACRE PHOSPHORUS BUDGET: 0.068 LBS P/ACRE/YEAR
PROJECT PHOSPHORUS BUDGET: 1.646 LBS P/ACRE/YEAR
PROJECT PHOSPHORUS EXPORT: 0.589 LBS P/YEAR

SEED AND MULCH SPECIFICATIONS

SEED MIX SPECIFICATIONS		
SEED MIX NAME ¹	SEED MIX COMPONENTS	LB./ACRE ¹
TEMPORARY SEED MIX	ANNUAL RYEGRASS	40
PERMANENT SEED MIXES		
UPLANDS	NEW ENGLAND LOGGING ROAD MIX (OR APPROVED EQUAL)	20
WOODCHIP APPLICATION SEED MIX	NEW ENGLAND LOGGING ROAD MIX (OR APPROVED EQUAL)	20
SUPPLEMENTAL WINTER SEED MIX ²	WINTER RYEGRASS	120
NOTES: 1. INCREASE SEEDING RATES 10% WHEN HYDROSEEDING. 2. WINTER RYE WILL BE ADDED TO CONSERVATION MIX AT A RATE OF 120 LB./ACRE BETWEEN OCTOBER 1 AND APRIL 15. 3. PERMANENT SEED MIXES TO CONSIST OF NATIVE GRASSES, RUSHES, FORBS, AND WILDFLOWERS.		

SUMMARY OF TEMPORARY AND PERMANENT MULCH APPLICATION REQUIREMENTS			
CONDITION	TIMING	MULCH TYPE ²	APPLICATION RATES
TEMPORARY			
INACTIVE AREAS	IF NO ACTIVITY IN EXPOSED AREAS FOR 7 DAYS, OR PRIOR TO A STORM EVENT	STRAW MULCH OR WOOD FIBER MULCH OR EROSION CONTROL MIX	2 TONS/ACRE 1 TON/ACRE 2" THICK OVER AREA
ALL DISTURBED AREAS OF THE CONSTRUCTION WORKSPACE	APPLY MULCH TO ALL EXPOSED AREAS IF NO ACTIVITY OCCURS WITHIN 30 DAYS. APPLY MULCH AND TEMPORARY SEEDING SOONER WHEN IT CAN BE ANTICIPATED THAT ACTIVITY IS NOT GOING TO OCCUR WITHIN 30 DAYS.	STRAW MULCH OR WOOD FIBER MULCH	2 TONS/ACRE 1 TON/ACRE ³
ALL WORK AREAS EXPOSED ARE TO BE MULCHED DAILY EACH TIME SOIL IS DISTURBED ²	NOVEMBER 1 - APRIL 15	STRAW MULCH OR WOOD FIBER MULCH	4 TONS/ACRE 2 TONS/ACRE
PERMANENT			
ON ALL EXPOSED AREAS AFTER SEEDING TO STABILIZE THE SOIL SURFACE	PERMANENT GRASS AND/OR LEGUME SEEDING COVERED BY STRAW MULCH ON ALL AREAS THAT HAVE BEEN RESTORED TO FINAL GRADE. THIS DOES NOT APPLY TO AREAS STABILIZED BY OTHER MEANS SUCH AS JUTE MATTING OR PERMANENT EROSION CONTROL MIX.	CRIMPED STRAW MULCH OR PAPER MULCH OR WOOD FIBER MULCH	2 TONS/ACRE 1500 LB./ACRE ⁴ 1 TON/ACRE
WOOD CHIP APPLICATION AREAS ⁵	PERMANENT GRASS AND/OR LEGUME SEEDING COVERED BY STRAW MULCH ON ALL AREAS THAT HAVE BEEN RESTORED TO FINAL GRADE. THIS DOES NOT APPLY TO AREAS STABILIZED BY OTHER MEANS SUCH AS JUTE MATTING OR PERMANENT EROSION CONTROL MIX.	CRIMPED STRAW MULCH OR PAPER MULCH OR WOOD FIBER MULCH	2 TONS/ACRE 1500 LB./ACRE ⁴ 1 TON/ACRE
NOTES: 1. IN ALL CASES, SUFFICIENT MULCH SHALL BE APPLIED SUCH THAT NO SOIL IS VISIBLE THROUGH THE MULCH. 2. DOUBLE RATE OF WOOD FIBER MULCH WHEN USED IN OR ADJACENT TO CRITICAL AREAS. INCREASE MULCH RATE BY HALF UNDER SOLAR ARRAY DRIP EDGE. 3. STRAW, HAY, OR HYDROMULCH (WOOD FIBER OR PAPER MULCH AS APPROPRIATE) SHALL PROVIDE MINIMUM 90 PERCENT GROUND COVERAGE. 4. PAPER MULCH IS ACCEPTABLE FOR USE DURING THE GROWING SEASON. ON SLOPES >30 PERCENT AND IN AREAS WHERE VEGETATION HAS NOT ESTABLISHED WELL, ADDITIONAL HAY MULCH WILL BE ADDED AS A WINTERIZING MEASURE. 5. MULCH MAY NOT BE SPREAD ON TOP OF SNOW. 6. WOODCHIPS SHALL BE APPLIED AT A MAXIMUM THICKNESS OF 4-INCHES AND ONLY IN UPLAND AREAS.			

SUMMARY OF SEEDING REQUIREMENTS		
CONDITION	TIMING ^{1,2}	SEED MIX
TEMPORARY SEEDING ³	TEMPORARY SEED BETWEEN APRIL 15 AND OCTOBER 1 ONLY. DISTURBED AREAS OR SOIL STOCKPILES WILL BE SEED IMMEDIATELY IF FURTHER DISTURBANCE IS NOT EXPECTED FOR 30 DAYS OR MORE.	ANNUAL RYEGRASS
PERMANENT SEEDING ^{3,4}		
UPLAND PORTIONS OF THE CONSTRUCTION AREA	DISTURBED AREA WILL BE SEEDDED WITHIN 7 DAYS OF FINAL GRADING.	UPLAND MIX
SLOPES > 3:1	DISTURBED AREA WILL BE SEEDDED IMMEDIATELY AFTER SEEDBED PREPARATION.	UPLAND MIX
AS DIRECTED	DISTURBED AREAS DESIGNATED FOR STABILIZATION WITH THE POLLINATOR MIX SHALL BE SEEDDED WITHIN 7 DAYS OF FINAL GRADING.	POLLINATOR SEED MIX
WOODCHIP APPLICATION AREAS	DISTURBED AREA WILL BE SEEDDED WITHIN 7 DAYS OF FINAL GRADING.	WOODCHIP APPLICATION SEED MIX
WINTER DORMANT SEEDING	DORMANT SEED BETWEEN OCTOBER 1 AND APRIL 15 ONLY. NO SEEDING WILL OCCUR IF SNOW DEPTHS EXCEED 1 INCH.	CONSERVATION MIX PLUS WINTER RYEGRASS
NOTES: 1. WEATHER CONDITIONS PERMITTING. 2. AREAS THAT DO NOT SUCCESSFULLY REVEGETATE WITHIN APPROPRIATE PERIOD OF TIME WILL BE RESEED AS NECESSARY. 3. LOOSEN COMPACTED SOIL TO A MINIMUM DEPTH OF 4 INCHES. 4. TOP DRESS WITH 4 to 6 INCHES LOAM, AS NEEDED.		

PERMITTING

NOT FOR CONSTRUCTION

SEAL:	PROFESSIONAL ENGINEER:			
	THOMAS N. DANIELS, JR.			
	DATE: MAY 12, 2020			
01	TRC	5/12/20	ISSUED FOR LOCAL PERMITTING	TND
NO.	BY	DATE	REVISION	APPD.
PROJECT: SOLAR FIELDS LLC PROPOSED 2MW SOLAR ARRAY 242 MANCHESTER RD, BELGRADE, MAINE				
TITLE: GENERAL NOTES & LEGEND				
DRAWN BY: TRC/ARD		PROJ. NO.: 389694		
CHECKED BY: TND		G-2		
APPROVED BY: TND				
DATE: MAY 2020				
		14 Gabriel Drive Augusta, ME 04330 Phone: 207.620.3800 www.trcsolutions.com		
FILE NO.:		389694-G-SHEETS.dwg		

EROSION CONTROL NOTES

PROJECT DESCRIPTION

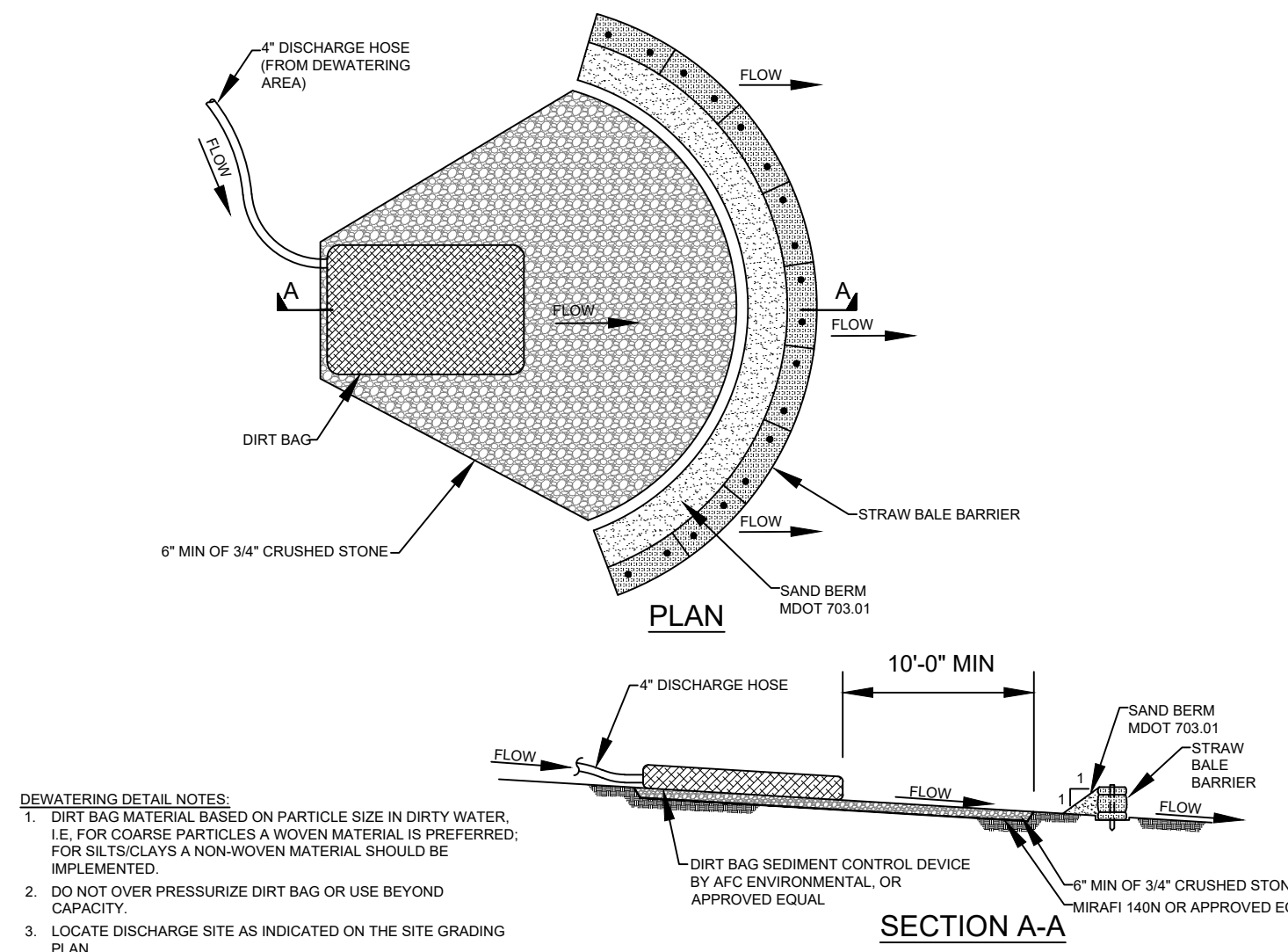
THE PROJECT INVOLVES THE CONSTRUCTION OF A GROUND-MOUNTED PHOTOVOLTAIC SOLAR MODULE SYSTEM AND ALL RELATED ACCESS ROADS, UTILITIES, SITE PREPARATION, CLEARING & GRUBBING, EROSION & SEDIMENTATION CONTROL MEASURES, AND TEMPORARY ACCESS ROADS.

CONSTRUCTION SEQUENCE

1. ALL CONTRACTORS ENGAGED IN SOIL DISTURBANCE SHALL BE CERTIFIED IN BASIC AND ADVANCED EROSION CONTROL PRACTICES BY MDEP UNLESS OTHERWISE APPROVED BY THE OWNER, ENGINEER, AND TOWN OF BELGRADE.
2. ESTABLISH CONSTRUCTION WORKSPACE LIMITS, IDENTIFY AND MARK SENSITIVE RECEPTORS INCLUDING NATURAL RESOURCES AND DOWNGRADIENT DRAINAGE INFRASTRUCTURE.
3. INSTALLATION OF ALL EROSION AND SEDIMENT CONTROL MEASURES AND ASSOCIATED WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE "MAINE EROSION AND SEDIMENT CONTROL PRACTICES FIELD GUIDE FOR CONTRACTORS" (REVISED 2014).
4. PRIOR TO USAGE, CONSTRUCT AND STABILIZE THE CONSTRUCTION ENTRANCE IN THE LOCATIONS INDICATED ON THE EROSION CONTROL PLAN SHEET.
5. CLEAR TIMBER, BRUSH, AND COMPLETE TREE REMOVAL, GRUBBING SHALL NOT BE COMPLETED UNTIL JUST PRIOR TO PRELIMINARY GRADING AND ESTABLISHMENT AND STABILIZATION OF TEMPORARY OR PERMANENT DRAINAGE CONVEYANCES.
6. INSTALL AND MAINTAIN PERIMETER DIVERSION BARRIERS SUCH AS SILT FENCING OR OTHER APPROVED EROSION CONTROL BARRIERS ALONG THE DOWNHILL LIMIT OF DISTURBANCE AS SHOWN ON THE DRAWINGS. SEDIMENT BARRIER LOCATIONS MAY BE ADJUSTED IN THE FIELD BASED ON ACTUAL SITE CONDITIONS AS DEEMED NECESSARY TO ENSURE PROPER FUNCTION. WHERE SILT FENCE CANNOT BE TOED-IN PROPERLY DUE TO TREE ROOTS, ROCKS, OR FROZEN GROUND, HAY BALES OR AN EROSION CONTROL MIX BERM MAY BE SUBSTITUTED. PERIMETER SEDIMENT BARRIERS SHALL BE INSTALLED AS SOON AS POSSIBLE BUT MAY FOLLOW INITIAL SITE PREPARATION, EROSION OR SEDIMENTATION ISSUES DEVELOPING DURING INITIAL SITE PREPARATION SHALL BE TEMPORARILY STABILIZED AS NECESSARY.
7. STABILIZE PERMANENT ACCESS ROAD SURFACES, PARKING AREAS, AND EQUIPMENT STORAGE AND LAYDOWN AREAS WITH MATTING, CRUSHED STONE, OR GRAVEL SUBBASE AS NECESSARY TO MINIMIZE RUTTING AND AVOID PONDING OF STORMWATER.
8. CONCURRENT WITH INITIATION OF SITE GRADING, CONSTRUCT AND STABILIZE TEMPORARY DRAINAGE SWALES, DIVERSION BERMS, CHECK DAMS, AND CULVERTS WITH TEMPORARY INLET AND OUTLET PROTECTION TO MINIMIZE SEDIMENT IN SITE RUNOFF DURING CONSTRUCTION. DEWATERING SHALL BE IN ACCORDANCE WITH THE DEWATERING NOTES.
9. INSTALL PROPERLY SPACED STONE CHECK DAMS IN ANY SECTION OF DITCH WITHIN 24-HOURS OF FORMING, SHAPING, OR ROUGH GRADING THAT SECTION DITCH.
10. MINIMIZE THE AMOUNT OF DISTURBANCE AT ANY ONE TIME BY STAGING CONSTRUCTION AS MUCH AS PRACTICAL FOR EFFICIENT CONSTRUCTION OF THE FACILITY. NATURAL VEGETATIVE BUFFERS SHOULD BE LEFT IN PLACE WHERE FEASIBLE TO AID IN SEDIMENT RETENTION AND REDUCE THE POTENTIAL FOR EROSION.
11. STABILIZE ANY NEWLY GRADED SLOPE GREATER THAN EIGHT PERCENT AND ANY SECTION OF NEWLY CONSTRUCTED DITCH USING ANCHORED EROSION CONTROL BLANKETS OR OTHER APPROVED MULCHING TECHNIQUES WITHIN 24-HOURS. ALL VEGETATED DITCHES THAT HAVE NOT BEEN STABILIZED BY NOVEMBER 1, OR WILL BE WORKED ON BETWEEN NOVEMBER 1 AND APRIL 15, MUST BE STABILIZED WITH STONE LINING BACKED BY GRAVEL BED OR GEOTEXTILE AS SPECIFIED BY THE ENGINEER.
12. DUST CONTROL METHODS SHALL BE EMPLOYED AFTER GRADING AND PRIOR TO FINAL STABILIZATION TO PREVENT THE BLOWING AND MOVEMENT OF NUISANCE DUST THROUGH THE APPLICATION OF WATER AND/OR CALCIUM CHLORIDE.
13. APPLY TEMPORARY SEED AND MULCH TO EXPOSED AREAS WHERE ACTIVITY IS NOT ANTICIPATED FOR 30-DAYS/ TEMPORARILY MULCH ANY EXPOSED AREAS WITHIN 100-FEET OF A WETLAND OR NATURAL RESOURCE WHERE WORK IS NOT ANTICIPATED OR HAS NOT OCCURRED IN 7 DAYS.
14. REMOVE EXCESS SPOILS FROM THE SITE THAT WILL NOT BE USED FOR THE FINAL DESIGN AND STABILIZATION. STOCKPILED SOILS THAT REMAIN IN PLACE FOR 48-HOURS OR MORE SHALL BE CONTAINED WITH SEDIMENT BARRIERS. THE SEDIMENT BARRIERS SHALL BE REINFORCED TO HANDLE A SIGNIFICANT RAIN EVENT AND THE POTENTIAL SLUMPING OF THE PILE. BETWEEN APRIL 15 AND OCTOBER 1, APPLY TEMPORARY SEED AND MULCH TO A STOCKPILE THAT IS NOT ANTICIPATED TO BE DISTURBED WITHIN 30-DAYS. APPLY ANCHORED MULCH DAILY AND/OR AS NEEDED DURING WINTER CONSTRUCTION.
15. INSPECT AND REPAIR EROSION CONTROL MEASURES DAILY IN AREAS OF ACTIVE CONSTRUCTION; OTHERWISE WEEKLY AND AFTER A RAINFALL EVENT OF 0.5-INCHES OR GREATER WITHIN A 24-HOUR PERIOD. REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES 1/2 OF THE HEIGHT OF THE BARRIER.
16. MONITOR PUBLIC ROADS FOR SIGNS OF TRACKING OR SPILLING OF SPOIL MATERIAL AND CLEAN-UP AS NECESSARY.
17. COMPLETE FINAL GRADING AND STABILIZATION OF EARTHEN STRUCTURES SUCH AS DIVERSION BERMS, LEVEL SPREADERS, AND SWALES THAT WILL CONTROL POST-CONSTRUCTION RUNOFF.
18. FINISH GRADE AND REPLACE TOPSOIL OR LOAM IN DISTURBED AREAS. SEED AND MULCH DISTURBED AREAS WITHIN 6 DAYS OF FINAL GRADING. BETWEEN NOVEMBER 1 AND APRIL 15, STABILIZE AREAS THAT ARE FINAL GRADED AT THE END OF EACH DAY.
19. MAINTAIN ALL TEMPORARY EROSION CONTROLS AND SEDIMENT BARRIERS UNTIL VEGETATION HAS BEEN ESTABLISHED OVER 90% OF THE AREA TO BE REVEGETATED. RESEED SPARSELY VEGETATED AREAS AS NECESSARY.
20. REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES ONCE THE SITE IS PERMANENTLY STABILIZED.

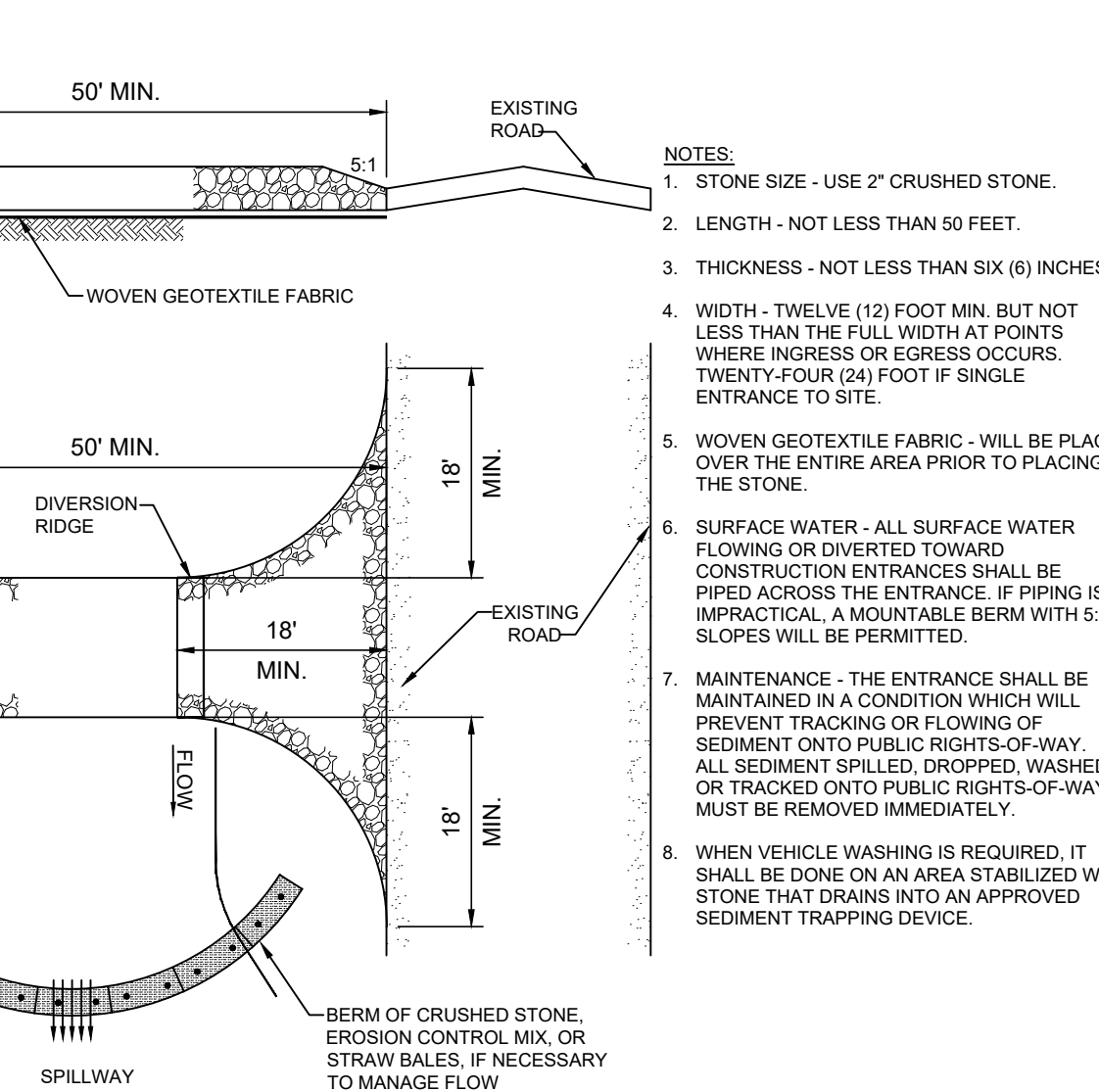
DEWATERING NOTES

1. THE CONTRACTOR SHALL INSTALL, MAINTAIN, AND OPERATE ALL CHANNELS, SUMPS, AND ALL OTHER TEMPORARY DIVERSION AND PROTECTIVE WORKS NEEDED TO DIVERT STREAM FLOW AND OTHER SURFACE WATER THROUGH OR AROUND THE CONSTRUCTION SITE. CONTROL OF SURFACE WATER SHALL BE CONTINUOUS DURING THE PERIOD THAT DAMAGE TO CONSTRUCTION WORK COULD OCCUR.
2. OPEN EXCAVATIONS SHALL BE DEWATERED AND KEPT FREE OF STANDING WATER AND MUDDY CONDITIONS AS NECESSARY FOR THE PROPER EXCAVATION WORK. THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE, AND MAINTAIN ALL DRAINS, SUMPS AND ALL OTHER EQUIPMENT REQUIRED TO PROPERLY DEWATER THE SITE. DEWATERING SYSTEMS THAT CAUSE A LOSS OF SOIL FINES FROM THE FOUNDATION AREAS WILL NOT BE PERMITTED.
3. INSTALL DIVERSION DITCHES OR BERMS IF NECESSARY TO MINIMIZE THE AMOUNT OF CLEAN STORMWATER RUNOFF ALLOWED INTO THE EXCAVATION AREA.
4. REMOVAL OF WATER FROM THE CONSTRUCTION SITE SHALL BE ACCOMPLISHED SO THAT EROSION AND TRANSPORTATION OF SEDIMENT AND OTHER POLLUTANTS ARE MINIMIZED.
5. DISCHARGE DEWATERING EFFLUENT TO AREAS AS INDICATED ON THE SITE GRADING PLAN. DISCHARGE SHALL BE MANAGED TO ENSURE SHEET FLOW.
6. DEWATERING IN PERIODS OF INTENSE HEAVY RAIN OR WHEN THE INFILTRATIVE CAPACITY OF THE SOIL IS EXCEEDED, SHALL BE AVOIDED TO THE MAXIMUM EXTENT PRACTICABLE.
7. FLOW TO THE SEDIMENT REMOVAL STRUCTURE MAY NOT EXCEED THE STRUCTURE'S CAPACITY TO SETTLE AND FILTER FLOW OR THE STRUCTURE'S VOLUME CAPACITY.
8. WHEN TEMPORARY WORKS ARE NO LONGER NEEDED, THE CONTRACTOR SHALL REMOVE AND RETURN THE AREA TO A CONDITION SIMILAR TO THAT WHICH EXISTED BEFORE CONSTRUCTION. AREAS WHERE TEMPORARY WORKS WERE LOCATED SHALL BE GRADED FOR SIGHTLY APPEARANCE WITH NO OBSTRUCTION TO NATURAL SURFACE WATER FLOWS OR THE PROPER FUNCTIONING AND ACCESS TO THE WORKS OF IMPROVEMENTS INSTALLED. THE CONTRACTOR SHALL EXERCISE EXTREME CARE DURING THE REMOVAL STAGES TO MINIMIZE THE LOSS OF SOIL, SEDIMENT AND DEBRIS THAT WAS COLLECTED DURING CONSTRUCTION.



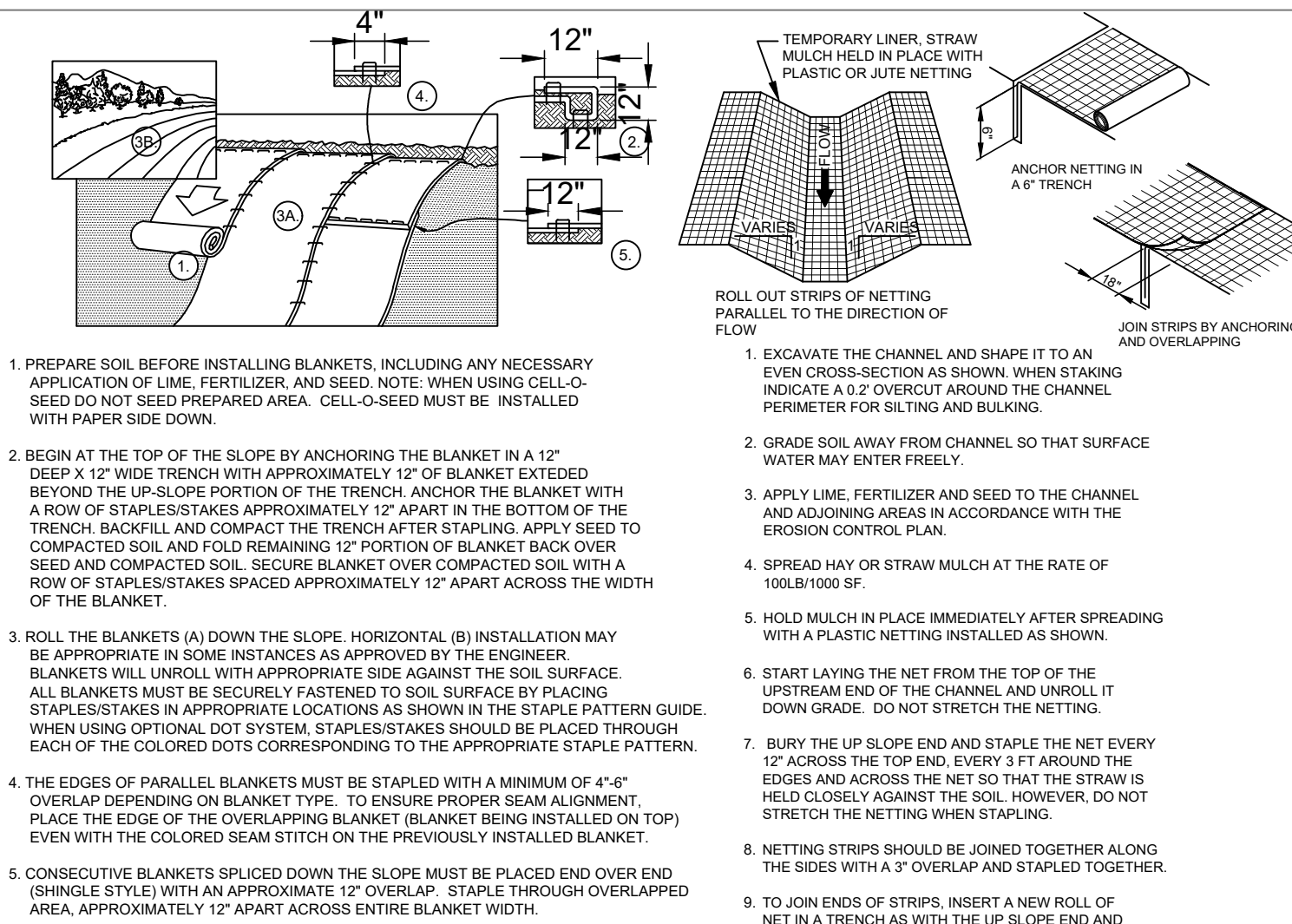
EXCAVATION DEWATERING DETAIL

NOT TO SCALE



STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE

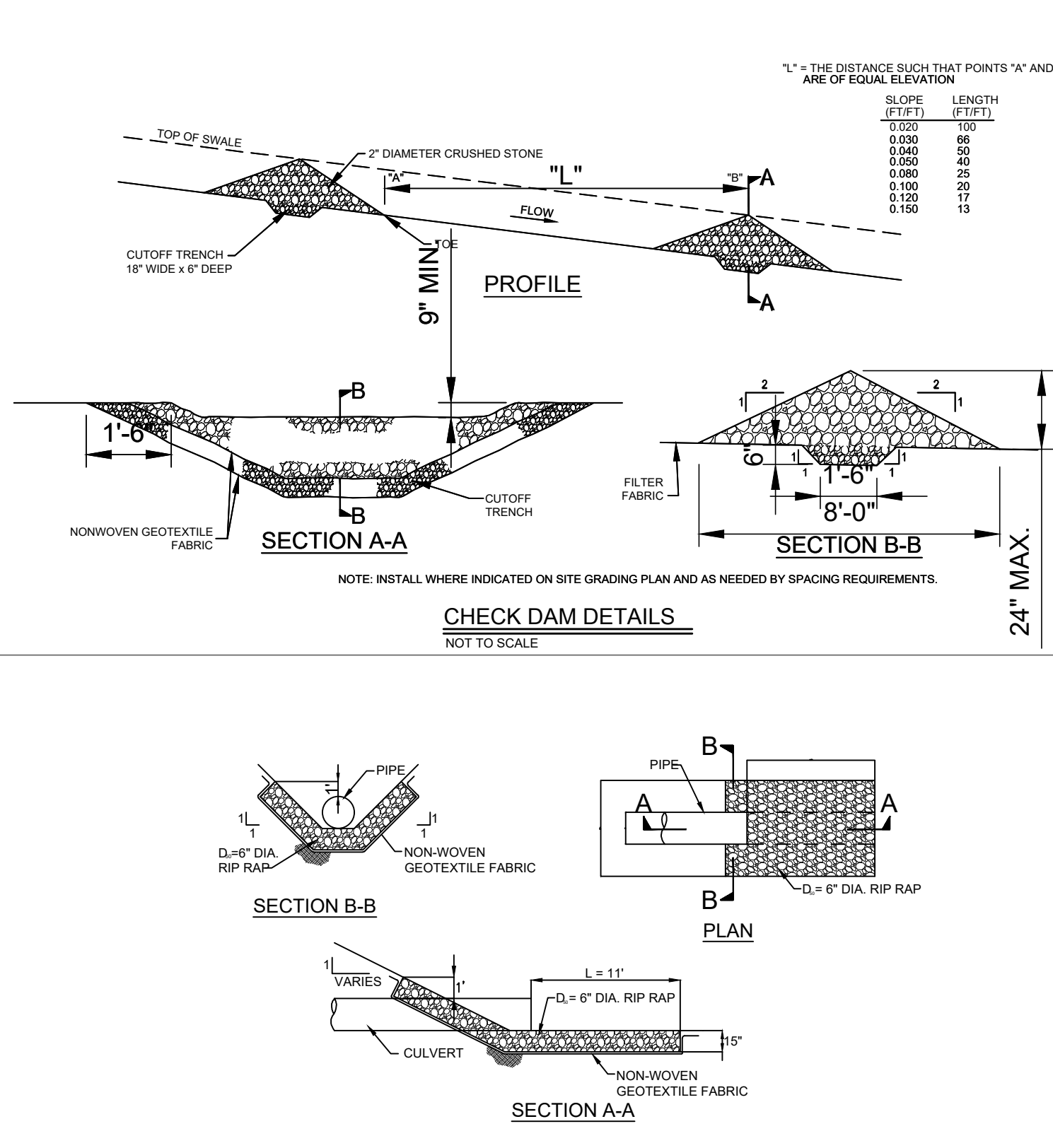


EROSION CONTROL BLANKET

NOT TO SCALE

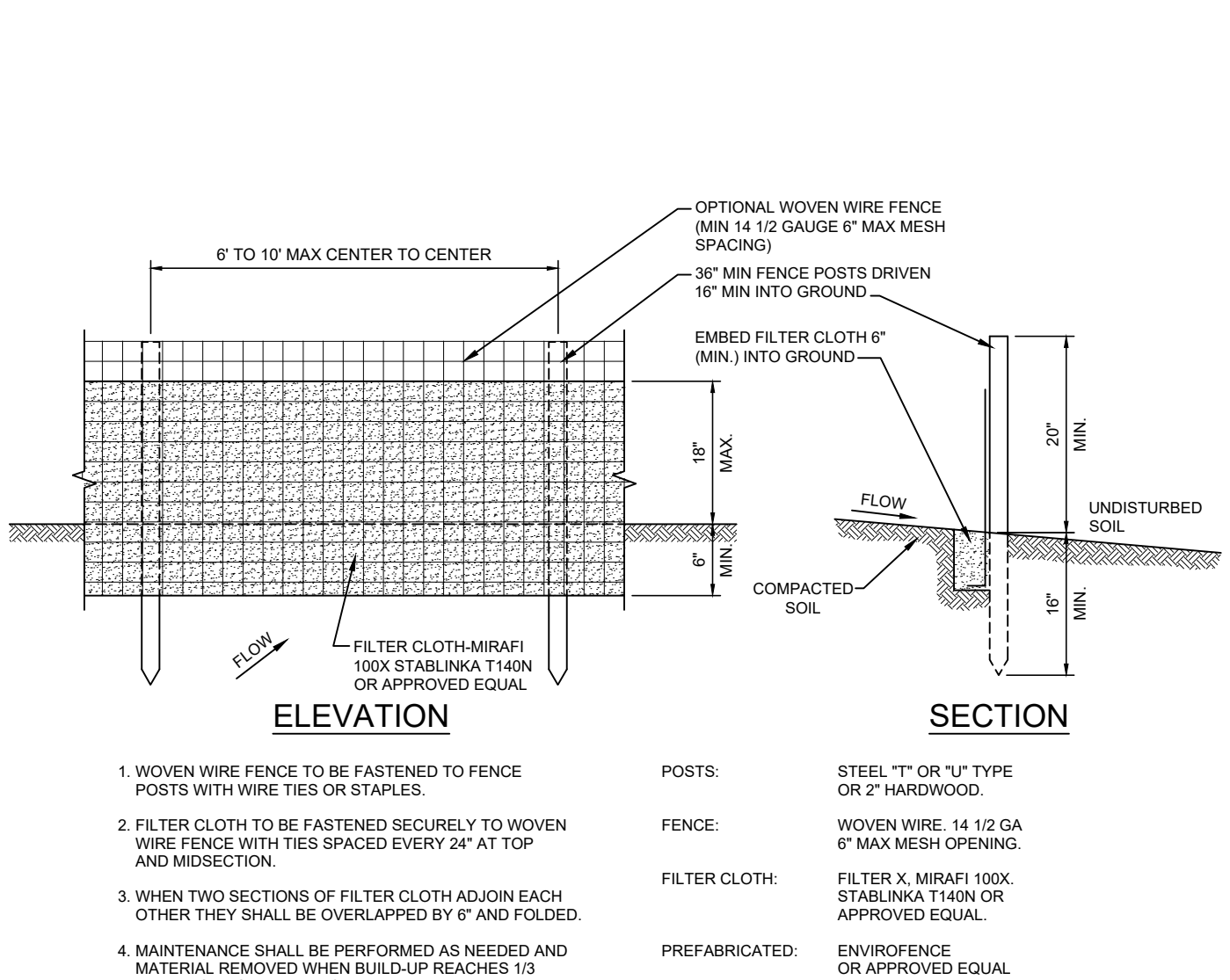
GRASS LINED DITCH

NOT TO SCALE



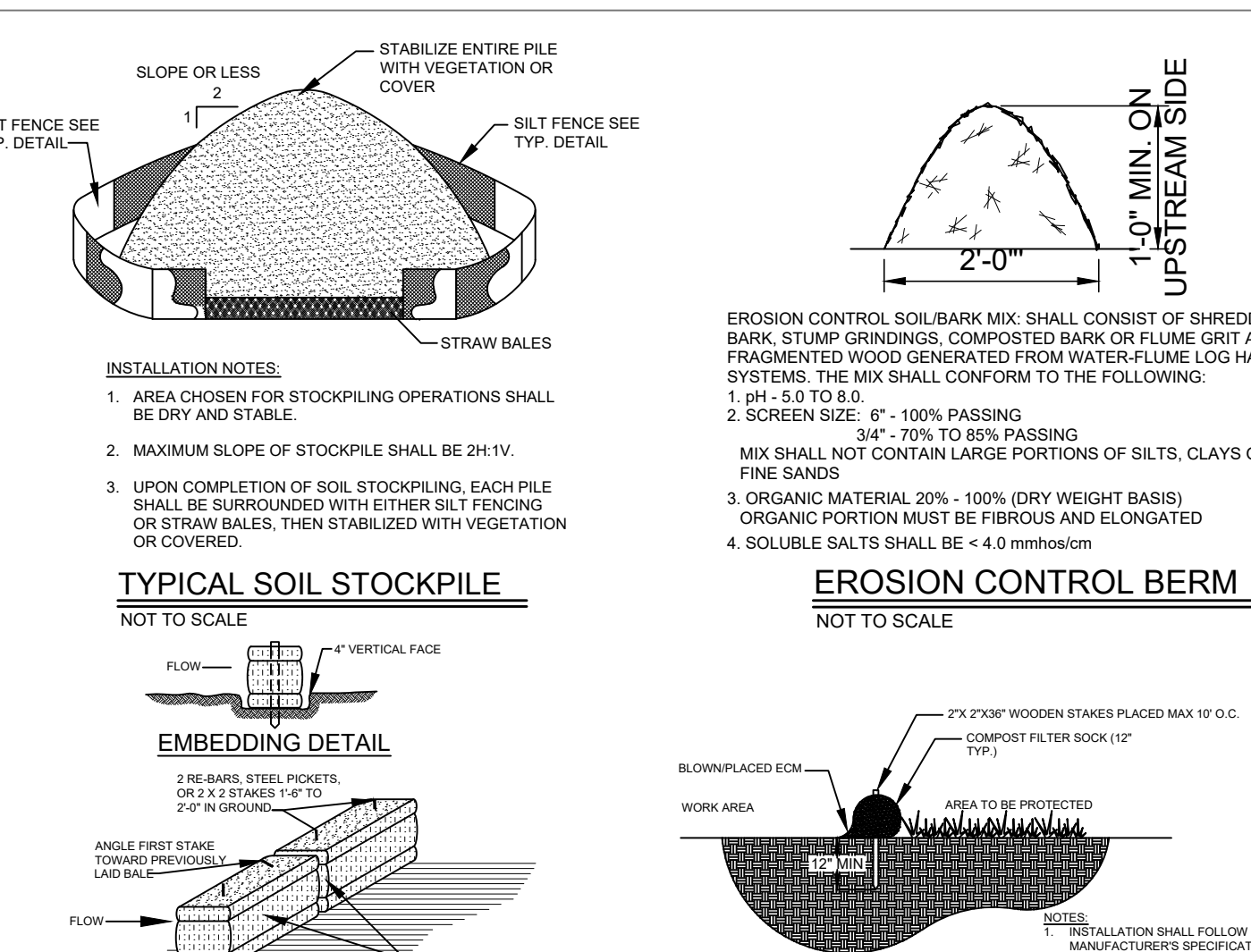
CULVERT INLET/OUTLET PROTECTION

NOT TO SCALE



SILT FENCE DETAILS

NOT TO SCALE

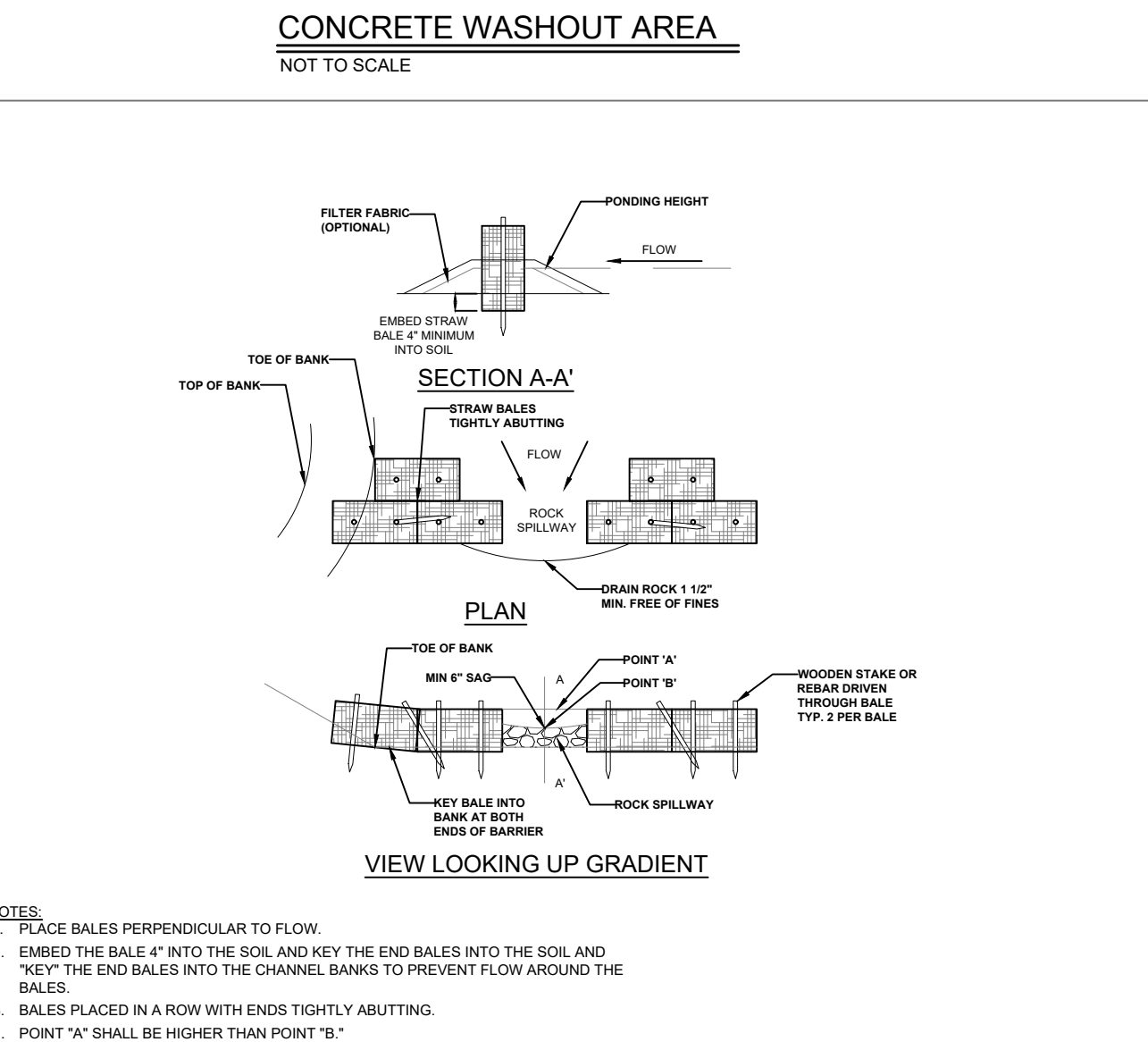
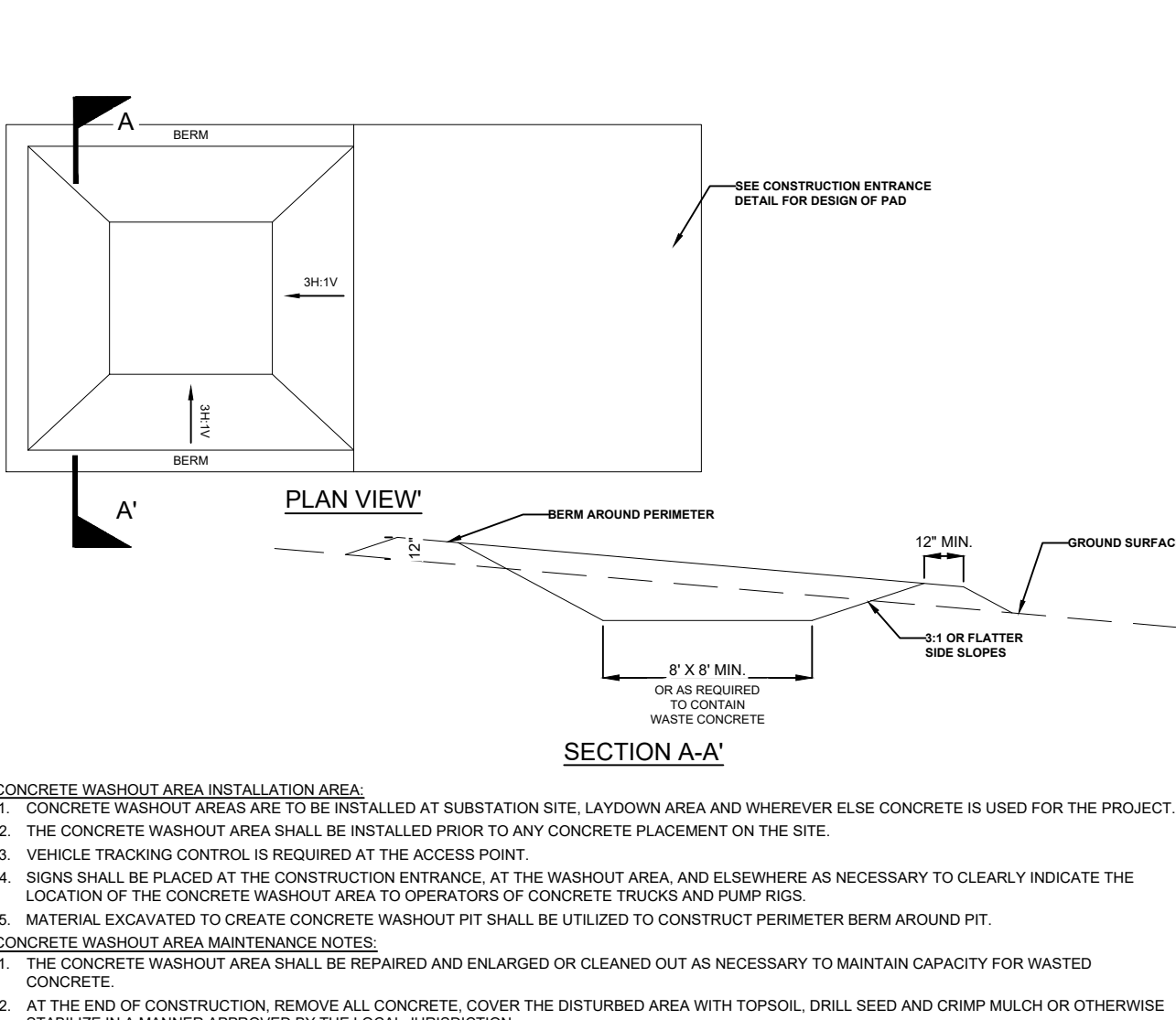
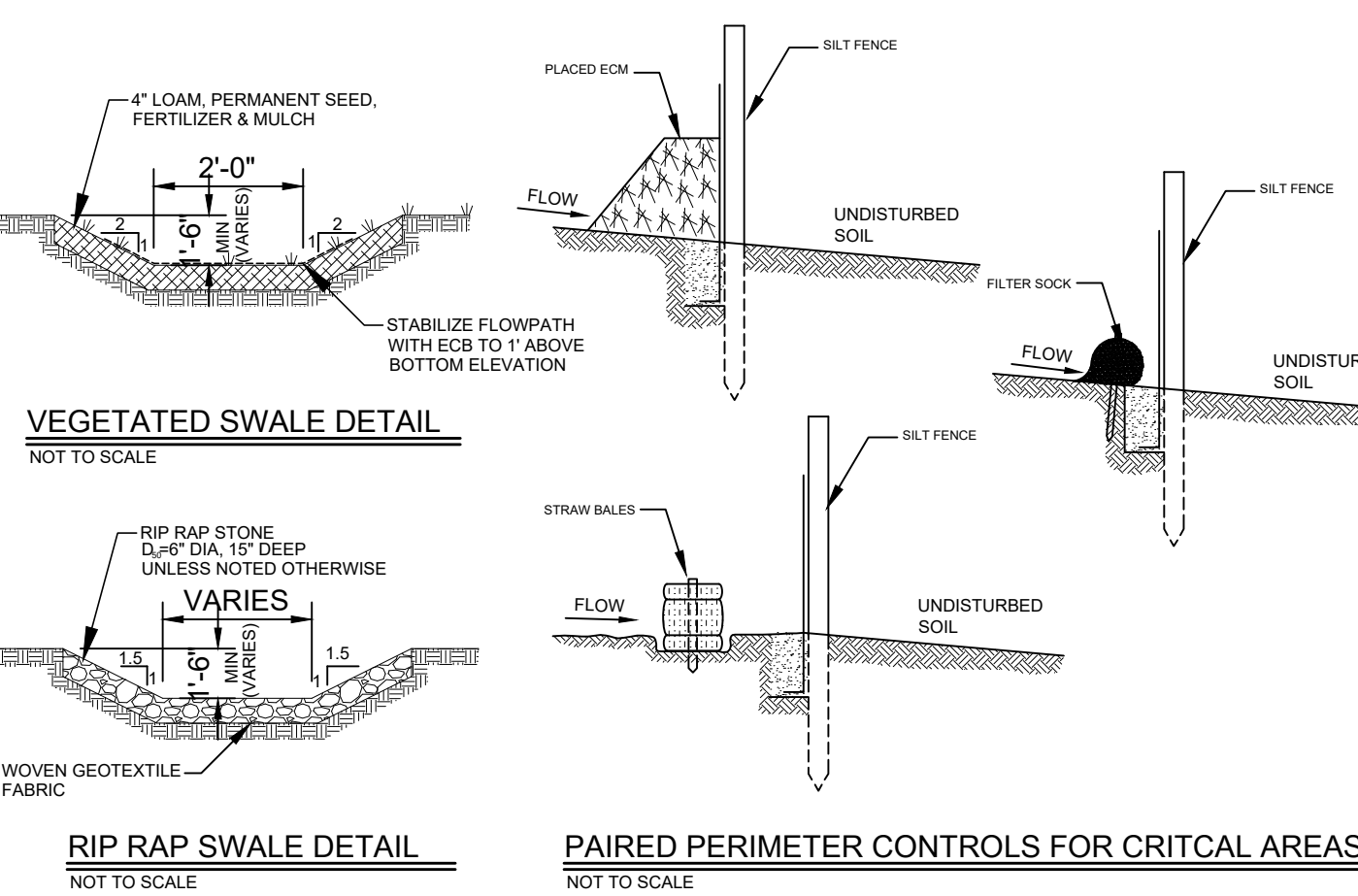


STRAW BALE BARRIER

NOT TO SCALE

COMPOST FILTER SOCK

NOT TO SCALE



SEMI-PERVIOUS SEDIMENT BARRIER

NOT TO SCALE

PERMITTING

NOT FOR CONSTRUCTION

SEAL:		PROFESSIONAL ENGINEER:	
		THOMAS N. DANIELS, JR.	
DATE:		MAY 12, 2020	
PROJECT: SOLAR FIELDS LLC PROPOSED 2MW SOLAR ARRAY 242 MANCHESTER RD, BELGRADE, MAINE			
TITLE: EROSION CONTROL NOTES & DETAILS			
DRAWN BY: TRC/ARD		PROJ. NO.: 389694	
CHECKED BY: TND		G-3	
APPROVED BY: TND		DATE: MAY 2020	
FILE NO.:		389694-G-SHEETS.dwg	



LEGEND

EXISTING SLOPE EXCEEDS 15%

0 60 120 180 240
SCALE IN FEET

0 60 120 180 240
SCALE IN FEET

PERMITTING
NOT FOR CONSTRUCTION

SEAL:

PROFESSIONAL ENGINEER:
THOMAS N. DANIELS, JR.

DATE:
MAY 12, 2020

01	TRC	5/12/20	ISSUED FOR LOCAL PERMITTING	TND
NO.	BY	DATE	REVISION	APPD.

PROJECT: **SOLAR FIELDS LLC
PROPOSED 2MW SOLAR ARRAY
242 MANCHESTER RD, BELGRADE, MAINE**

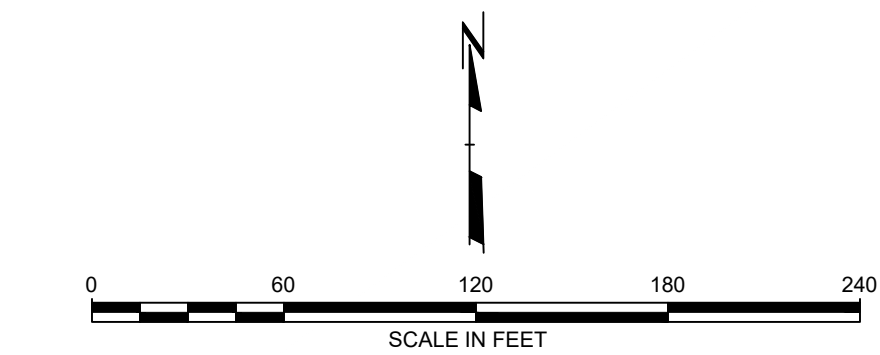
TITLE: **EXISTING CONDITIONS PLAN**

DRAWN BY:	TRC	PROJ. NO.:	389694
CHECKED BY:	TND		
APPROVED BY:	TND		
DATE:	MAY 2020		

TRC

14 Gabriel Drive
Augusta, ME 04330
Phone: 207.620.3800
www.trcsolutions.com

FILE NO.: 389694 - EXISTING_recover.dwg



PERMITTING
NOT FOR CONSTRUCTION



SEAL:	PROFESSIONAL ENGINEER:
	THOMAS N. DANIELS, JR.
	DATE:
	MAY 12, 2020

01	TRC	5/12/20	ISSUED FOR LOCAL PERMITTING	TND
NO.	BY	DATE	REVISION	APPD.

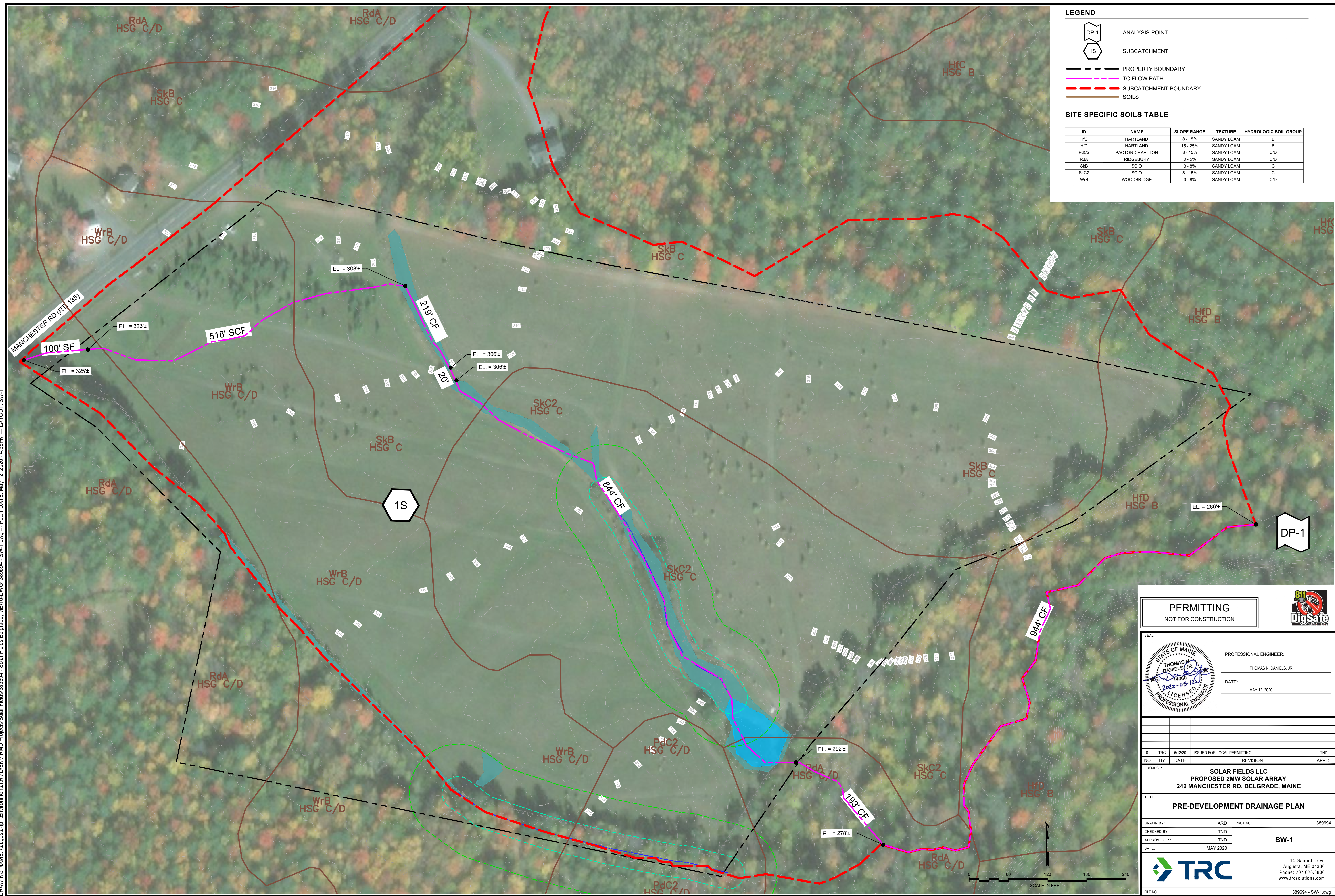
PROJECT: SOLAR FIELDS LLC
PROPOSED 2MW SOLAR ARRAY
242 MANCHESTER RD, BELGRADE, MAINE

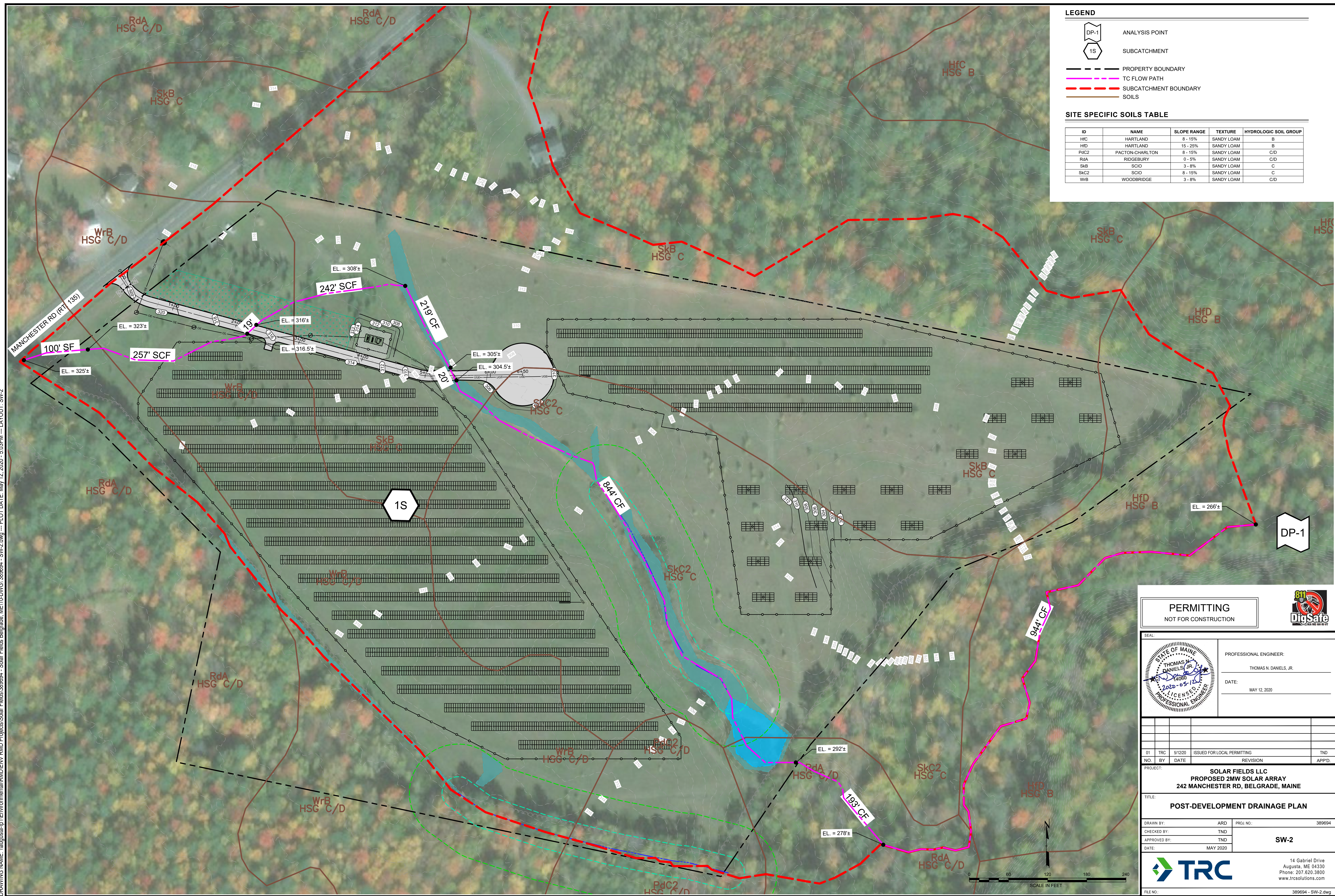
TITLE: SITE GRADING & DRAINAGE PLAN

DRAWN BY:	TRC	PROJ. NO.:	389694
CHECKED BY:	TND		
APPROVED BY:	TND		
DATE:	MAY 2020		

14 Gabriel Drive
Augusta, ME 04330
Phone: 207.620.3800
www.trcsolutions.com

2436 -- USER: Daniels -- ATTACHED SHEETS: 389694 - EXISTING POWER -- ATTACHED IMAGES: DigSafe, h20200512, DigSafe, h20200512
DRAWING NAME: \\augustia-fp1\Environmental\RMD\ENY RMD Projects\Solar Fields\389694 - Solar Fields Belgrade, ME\10-DWG\389694 - BASE-rev01.dwg --- PLOT DATE: May 12, 2020 - 4:41 PM --- LAYOUT: C-2
version 2017-10-21





LEGEND

The legend defines the following symbols:

- DP-1**: A pentagon shape with a dashed border, representing a Designated Point.
- 1S**: A hexagon shape with a solid border, representing a Subcatchment.
- PROPERTY BOUNDARY**: A solid black line.
- TC FLOW PATH**: A dashed magenta line.
- SUBCATCHMENT BOUNDARY**: A dashed red line.
- SOILS**: A solid brown line.

Attachment 10
Solar Panel Construction Detail

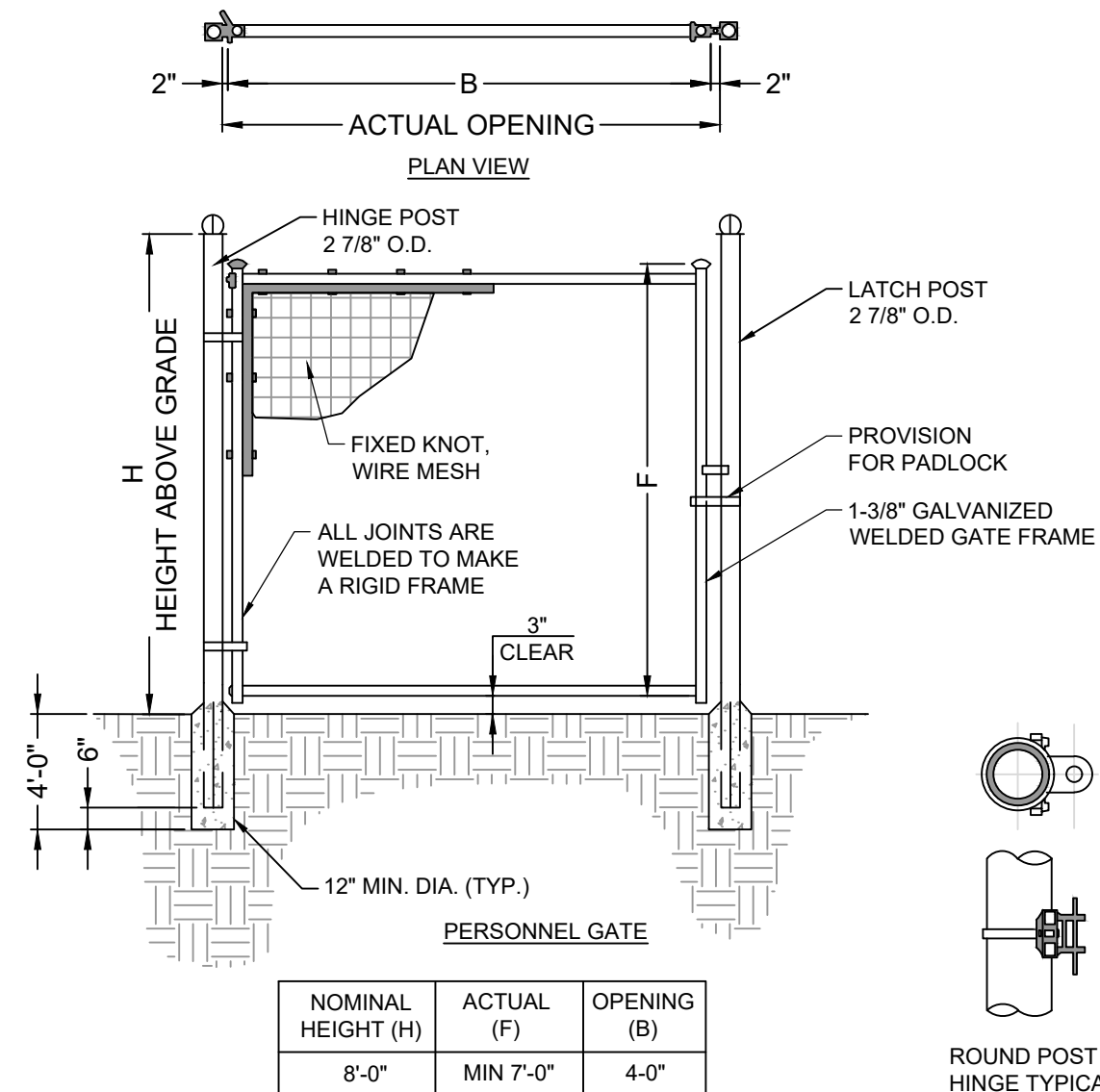
Diagram illustrating the fence assembly details:

- 5'x5' PRESSURE-TREATED SOUTHERN YELLOW PINE POSTS CHAMFERED TOP
- 6'-0" (Fence Panel Height)
- GROUND SURFACE
- 3'-6" MIN (Ground Surface Depth)
- FENCE LINE

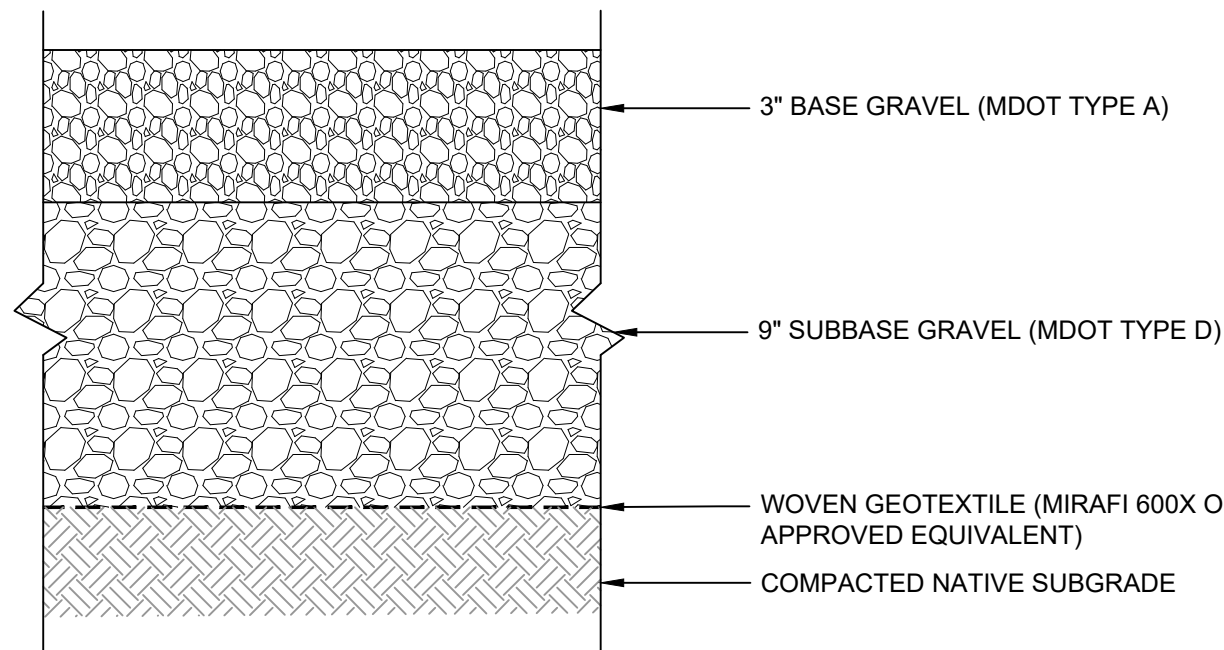
[illegible]

NOT TO SCALE

NOMINAL HEIGHT (H)	ACTUAL (F)	OPENING (B)
8'-0"	MIN 7'-0"	10'-0"

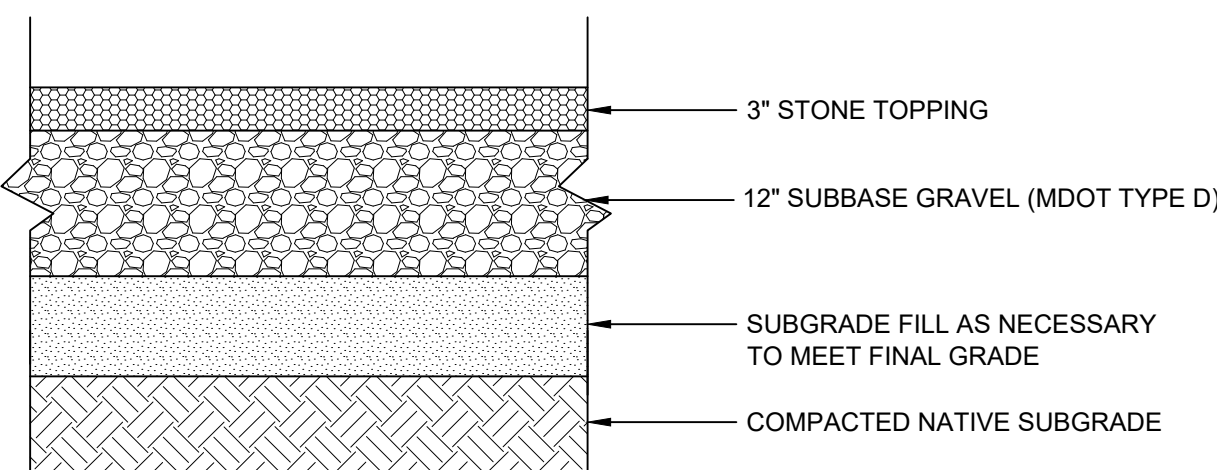


NOT TO SCALE



CONSTRUCTION NOTES:

1. BASE AND SUBBASE GRAVEL SHALL CONFORM TO MDOT 703.06. AGGREGATE SHALL BE DURABLE, CRUSHED ROCK CONSISTING OF THE ANGULAR FRAGMENTS OBTAINED BY BREAKING AND CRUSHING SOLID OR SHATTERED NATURAL ROCK, AND FREE FROM, A DETRIMENTAL QUANTITY OF THIN, FLAT, ELONGATED, OR OTHER OBJECTIONABLE PIECES.
2. BASE GRAVEL AND SUBBASE GRAVEL, SHALL BE COMPACTED TO 95% OF ASTM D1557 AND PLACED IN 4" LIFT. EXCESSIVE MOISTURE SHALL BE CORRECTED TO 3% TO 5%.
3. VEGETATION AND TOPSOIL WITHIN LIMIT OF ROAD FILL SHALL BE STRIPPED PRIOR TO PLACEMENT OF SUBGRADE FILL.
4. SUBGRADE SHALL BE COMPACTED TO 95% OF ASTM D1557 TO A DEPTH OF 12-INCHES.

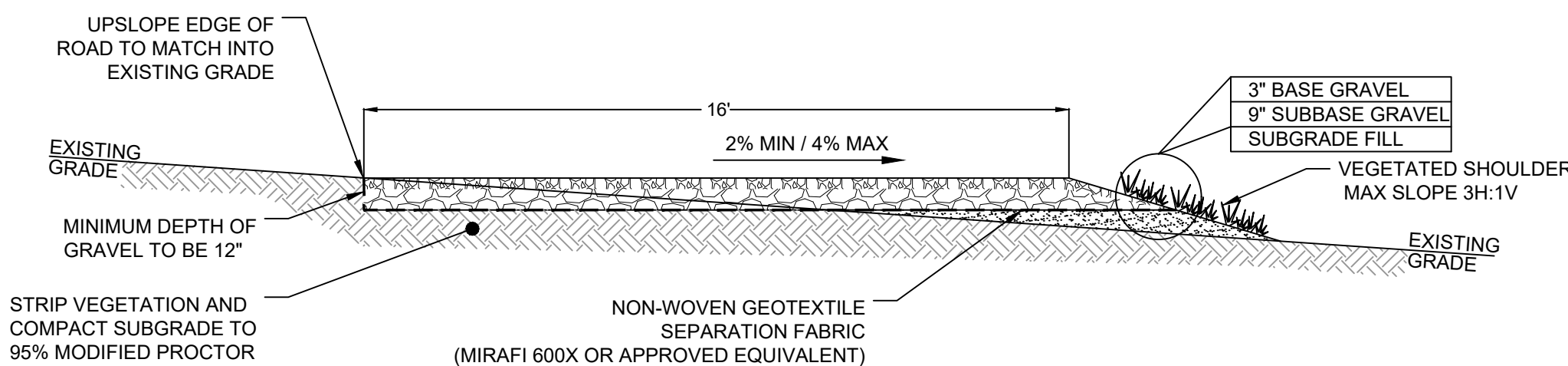


CONSTRUCTION NOTES

1. STONE TOPPING, ASTM C33, SIZE NUMBER 4. CRUSHED STONE TOPPING SHALL BE OBTAINED FROM ROCK OF UNIFORM QUALITY AND CONSIST OF CLEAN, ANGULAR FRAGMENTS OF QUARRIED ROCK, FREE FROM SOFT DISINTEGRATED PIECES OR OBJECTIONABLE MATTER. STONE TOPPING SHALL BE SPECIFIED CRUSHED STONE BLENDED TO BE A 50:50 MIX OF 1-1/2 INCH AND 3/4-INCH STONE. THE FOLLOWING GRADATION IS PROVIDED:

SIEVE DESIGNATION	PERCENTAGE BY WEIGHT PASSING SQUARE MESH SIEVES
2 INCH	100
1- 3/4 INCH	90-100
1 INCH	20-55
3/4 INCH	0-15
3/8 INCH	0-5
2. SUBBASE GRAVEL SHALL CONFORM TO MDOT 703.06. AGGREGATE SHALL BE DURABLE CRUSHED ROCK CONSISTING OF THE ANGULAR FRAGMENTS OBTAINED BY BREAKING AND CRUSHING SOLID OR SHATTERED NATURAL ROCK, AND FREE FROM A DETRIMENTAL QUANTITY OF DELETERIOUS MATERIALS.
3. VEGETATION SHALL BE STRIPPED FROM FOOTPRINT OF CRUSHED STONE PAD PRIOR TO PLACEMENT OF SUBGRADE FILL.
4. NATIVE SUBGRADE SHALL BE COMPACTED AND PROOF ROLLED PRIOR TO PLACEMENT OF SUBGRADE FILL.

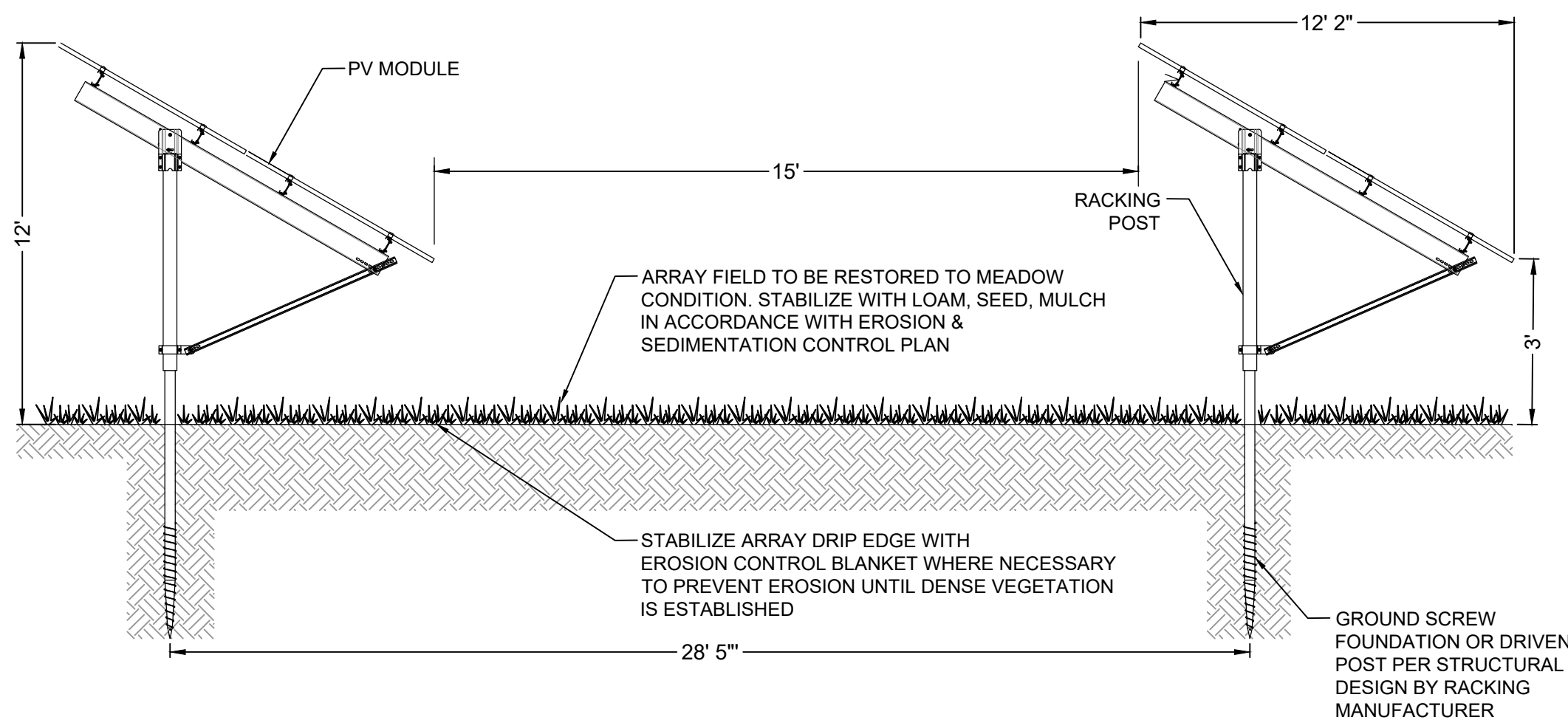
NOT TO SCALE



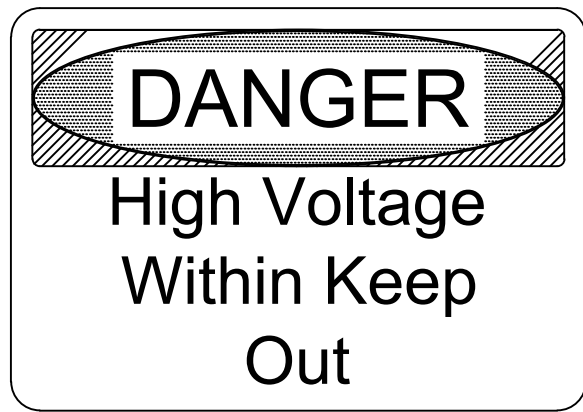
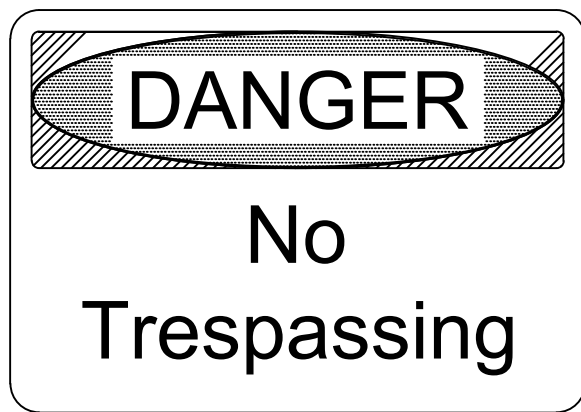
CONSTRUCTION NOTES:

1. SUBGRADE FILL SHALL BE GRANULAR BORROW (MDOT 703.19) OR AS SPECIFIED IN PROJECT GEOTECHNICAL REPORT.
2. GRAVEL SURFACE SHALL BE SUPERELEVATED AND SLOPED A MINIMUM OF 2% AS INDICATED IN PLAN VIEW. CROSS SLOPE SHALL NOT EXCEED 4%.
3. ROADWAY SHOULDER SHALL BE VEGETATED AND PREPARED TO DIRECT RUNOFF AS SHEETFLOW TO IDENTIFIED BUFFER AREAS.

NOT TO SCALE



NOT TO SCALE



NOTES

1. SIGNS SHALL CONFORM TO THE 2013 OSHA AND ANSI REQUIREMENTS.
2. SIGNS SHALL BE 20" WIDE BY 14" HIGH.
3. SIGNS SHALL HAVE A MOUNTING HEIGHT OF BETWEEN 45 TO 66 INCHES.
4. SIGN PANELS SHALL BE 10 GAUGE ALUMINUM WITH HIGH VISIBILITY REFLECTIVE SHEETING.
5. SIGNAGE SHALL INCLUDE 24-HR EMERGENCY CONTACT INFORMATION FOR FACILITY OPERATOR.

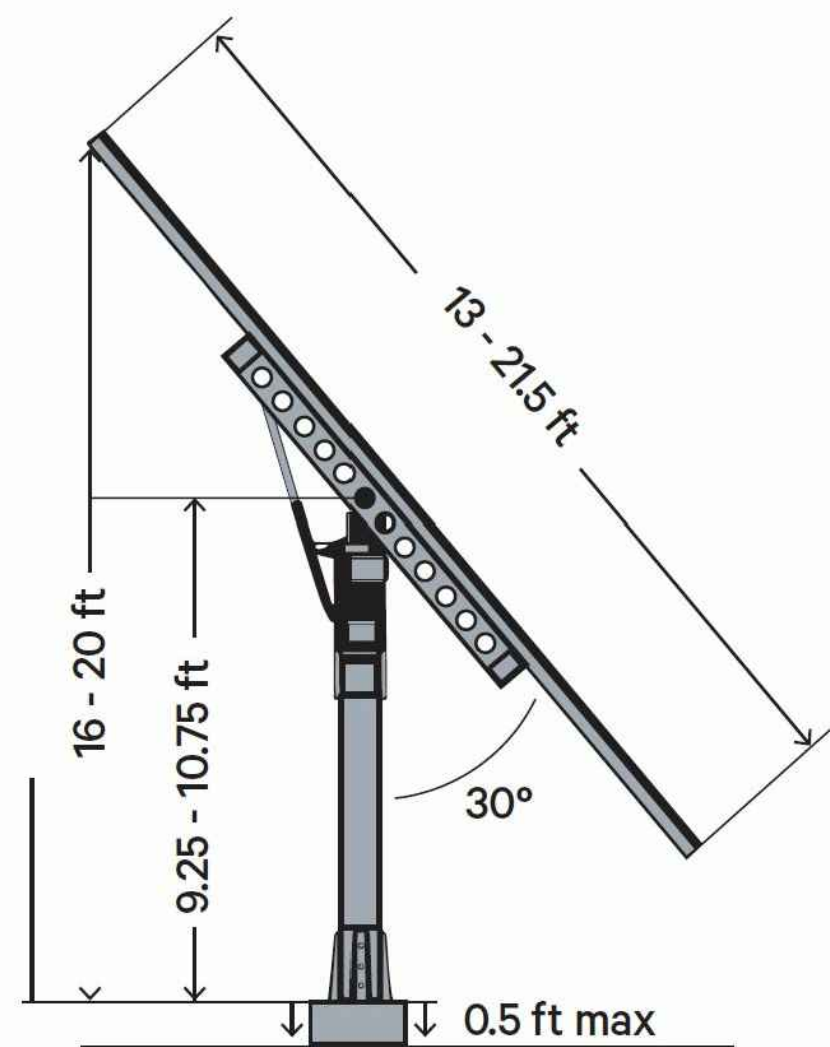
NOT TO SCALE



NOTES

1. WATER QUALITY BUFFERS SHALL BE PERMANENTLY MARKED IN THE FIELD AND REGISTERED WITH THE KENNEBEC COUNTY REGISTRY OF DEEDS.
2. SIGNS SHALL BE 20" WIDE BY 14" HIGH.
3. SIGNS SHALL HAVE A MOUNTING HEIGHT OF BETWEEN 24 TO 48 INCHES.
4. SIGN PANELS SHALL BE 10 GAUGE ALUMINUM OR OTHER APPROVED WEATHER RESISTANT MATERIAL.

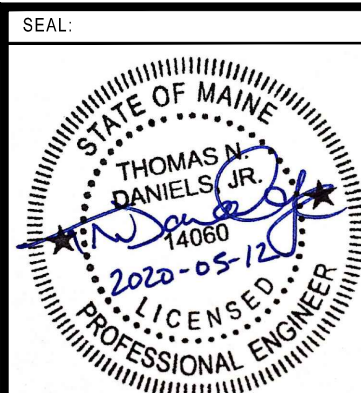
NOT TO SCALE



NOT TO SCALE

NOTES:
1. DETAIL PROVIDED BY ALLEARTH SOLAR OF WILLISTON, VT

NOT FOR CONSTRUCTION



PROFESSIONAL ENGINEER:

THOMAS N. DANIELS, JR.

DATE:

MAY 12, 2020

01	TRC	5/12/20	ISSUED FOR LOCAL PERMITTING	TND
NO.	BY	DATE	REVISION	APP'D.

PROJECT: SOLAR FIELDS LLC
PROPOSED 2MW SOLAR ARRAY
242 MANCHESTER RD, BELGRADE, MAINE

CIVIL CONSTRUCTION DETAILS

DRAWN BY:	TRC	PROJ. NO.:	389694
CHECKED BY:	TND	C-3	
APPROVED BY:	TND		
DATE:	MAY 2020		



14 Gabriel Drive
Augusta, ME 04330
Phone: 207.620.3800
www.trcsolutions.com

FILE NO.

389694 - DT.dwg

Attachment 11
Maine Historic Preservation Commission Consultation



14 Gabriel Dr.
Augusta, ME 04330

T 207.620.3800
TRCcompanies.com

April 29, 2020

Ms. Megan Rideout
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333-0065

Via Electronic Mail (Megan.M.Rideout@maine.gov)

**Re: Information Request for Cultural Resources Review within the Parker Station Solar Project,
Belgrade, Maine**

Dear Megan:

Solar Fields LLC is proposing a solar development (<18 acres) to be known as Parker Station on Route 135 in the town of Belgrade, Maine. The Project is a two-megawatt alternating current ground-mounted photovoltaic solar electric generation facility. Project components (Attached draft site plan) include fixed and tracker solar arrays, electric inverter, a gravel access road, underground electric cable, security fence, stormwater management buffer, and overhead electric interconnection line to connect the Project to the local distribution grid. On behalf of Solar Fields LLC, TRC Companies, Inc. (TRC) is requesting information from the Commission on any known, cultural resources within or adjacent to the Project parcel depicted on the enclosed USGS map.

The project requires issuance of a Commercial Development approval from the Belgrade Planning Board, two Permit-By-Rules for impacts adjacent to a protected resource and stormwater management from the Maine Department of Environmental Protection and a road opening permit from the Maine Department of Transportation.

A visual assessment of buildings adjacent to and across the street from the project was completed on April 24, 2020 and there are none greater than 50 years old. There are no buildings on the project site. Per a review of data available on the MHPC's Cultural and Architectural Resources Management Archive, there are no historic structures located on the project site or any of the associated access roads.

If occurrences of cultural features, such as archaeological resources, exist within or adjacent to the Project parcel, TRC respectfully requests information that would aid in Project planning. Please let us know if additional architectural or archaeological surveying is required. If you have any questions or comments regarding this request, please do not hesitate to contact me at (207)-441-4225 or mchristopher@trccompanies.com. Thank you for your attention to this request.

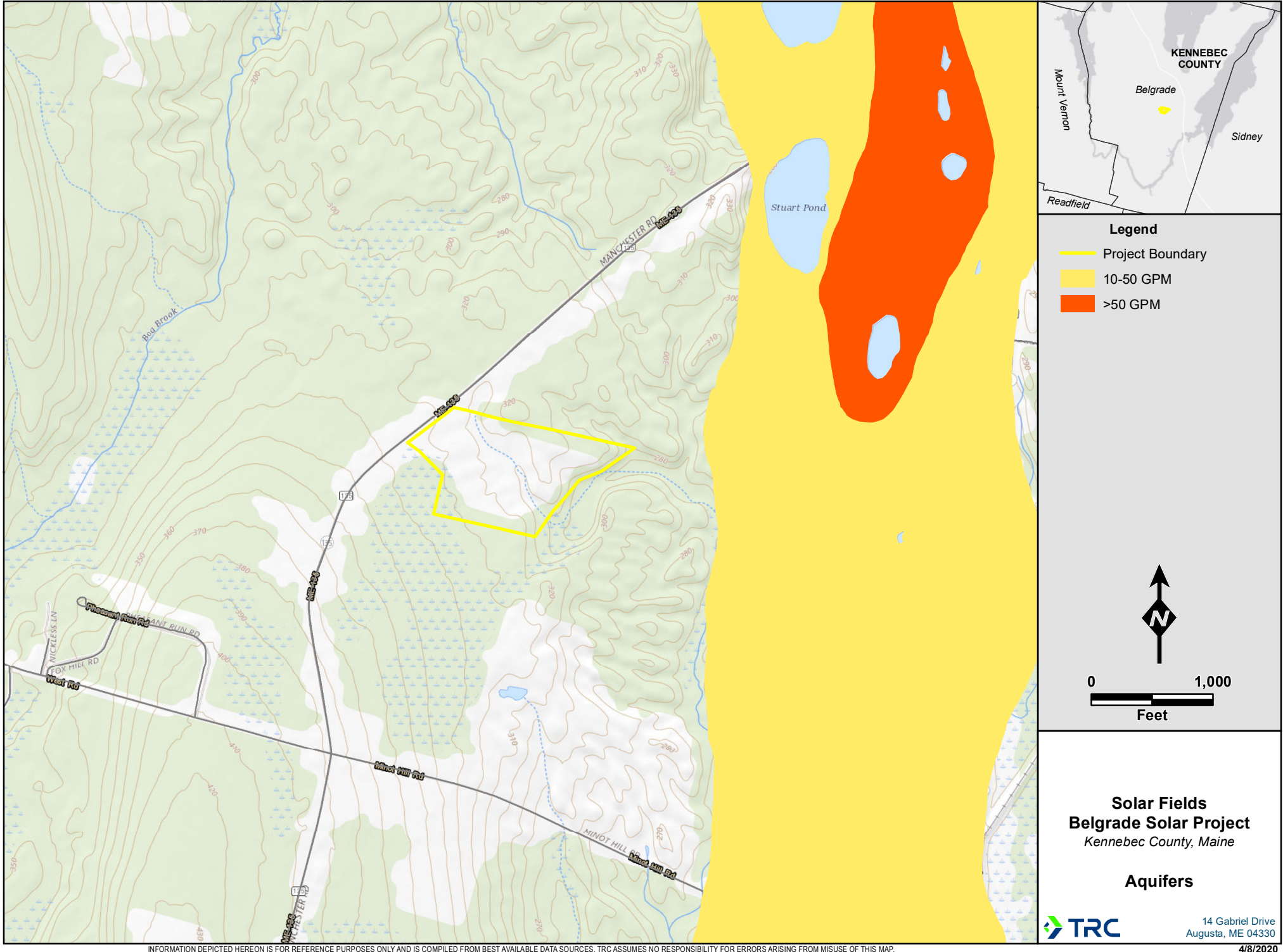
Sincerely,

A handwritten signature in blue ink, appearing to read "Mark Christopher".

Mark Christopher
Project Manager

Attachment: Draft Site Plan, USGS Location map
Cc: Steve Buchsbaum, Tom Daniels

Attachment 12
Maine Geological Survey Aquifer Map



Attachment 13
Stormwater Management Plan



Stormwater Management Report

May 2020



Reviewed and Approved by: Thomas N. Daniels, Jr, PE

**Solar Fields
2.0 MW Solar Array
Manchester Road (Rt. 135)
Belgrade, Maine**

Prepared For:

Solar Fields, LLC
376 West Road
Belgrade, ME 04917

Prepared By:

TRC Companies, Inc.
14 Gabriel Drive
Augusta, ME 04330



TABLE OF CONTENTS

1.0	PROJECT NARRATIVE	1
1.1	Project Location	1
1.2	Surface Water On or Abutting the Site.....	1
1.3	Downstream Waterbodies.....	1
1.4	General Topography	1
1.5	Flood Plain	2
1.6	Alterations to Natural Drainage Ways.....	2
1.7	Alterations to Land Cover Within Watershed.....	2
2.0	MAPS.....	3
2.1	Topographic Site Maps	3
2.2	Site Specific Soils Mapping.....	3
3.0	DRAINAGE PLANS.....	3
4.0	RUNOFF ANALYSIS.....	3
4.1	Precipitation	4
4.2	Runoff Curve Numbers	4
4.3	Time of Concentration Calculations	4
5.0	STORMWATER QUANTITY TREATMENT PLAN – FLOODING STANDARD	5
5.1	Peak Discharge Calculations	5
5.2	Variance Submissions	5
5.3	Calculations for the Sizing of Proposed Culverts and Stormwater Basins	5
5.4	Infiltration Systems.....	6
5.5	Drainage Easement Declarations	6
6.0	STORMWATER QUALITY – PHOSPHORUS CONTROL PLAN	6
6.1	Watershed Per-Acre Phosphorus Allocation	6
6.2	Project Phosphorus Budget	6
6.3	Project Phosphorus Export	7
6.4	Phosphorus Control Measures	7
6.5	Engineering Inspection for Stormwater Management Facilities	7
7.0	EROSION & SEDIMENTATION CONTROL – BASIC STANDARDS.....	8
7.1	Project Schedule.....	8
7.2	Erosion and Sediment Control Measures	8
7.2.1	Temporary Measures	9
7.2.2	Permanent Measures.....	11
7.2.3	Erosion Control Measure Removal.....	13
7.3	Overwinter Construction	13
7.4	Housekeeping	14
7.5	Inspection & Maintenance.....	15
7.6	Erosion & Sedimentation Control Conclusion.....	15

8.0	POST-CONSTRUCTION STORMWATER MAINTENANCE PLAN.....	15
8.1	Facilities to be Maintained	15
8.2	General Inspection and Maintenance Requirements.....	16
8.3	Access Roadway.....	16
8.4	Culverts	16
8.5	Vegetated Buffers	16
8.6	Revegetated Areas and Embankments	16
8.7	Re-certification	16
9.0	CERTIFICATION – PROFESSIONAL ENGINEER	18

ATTACHMENTS

Attachment A – Figures & Maps

Attachment B – Stormwater Calculations

Attachment C – Construction and Post-Construction Stormwater Inspection & Maintenance Log
Examples

Attachment D – Example Stormwater Buffer Deed Restriction

ACRONYMS

BMP	Best Management Practice
cfs	Cubic feet per second
CN	Runoff curve number
CPESC	Certified Professional in Erosion and Sedimentation Control
ECB	Erosion Control Blanket
ECM	Erosion Control Mix
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
fps	Feet per second
HSG	Hydrologic Soil Group
MDEP	Maine Department of Environmental Protection
NRCS	Natural Resources Conservation Service
PE	Professional Engineer
Project	Solar Fields Solar Project
Tc	Time of Concentration
USDA-SCS	United States Department of Agriculture Soil Conservation Service

1.0 Project Narrative

This Stormwater Management Report is provided to describe and quantify the pre- and post-development hydrology of the area to be impacted by the construction of the Solar Fields 2.0 MW_{AC} Solar Array Project (the Project) and to demonstrate that the proposed development will comply with the applicable Maine Department of Environmental Protection (MDEP) stormwater management requirements prescribed in Chapter 500 as well as the requirements of the Town of Belgrade Commercial Development Review Ordinance.

1.1 Project Location

The proposed ground-mounted photovoltaic solar module system will be constructed on portions of an approximately 24.9-acre parcel of land located off Manchester Road (Route 135) in the town of Belgrade, Maine. The parcel is comprised of approximately 21-acres of open fields historically used for a variety of agricultural uses, most notable a Christmas Tree farm from approximately 1966 to 2011, which have eventually returned to fallow un-grazed fields that are mowed periodically. The remainder of the parcel is wooded and undeveloped lands. Land use of abutting properties consist of single-family residences along the Manchester Road corridor and undeveloped wooded lands south, north, and east of the Project parcel.

1.2 Surface Water On or Abutting the Site

Natural resource surveys were conducted by Burman Land & Tree Company, LLC of Orrington, ME in April of 2020 to identify potential streams, wetlands, vernal pools, or other sensitive environmental receptors adjacent to or within the Project Area. A drainage swale traverses the Project parcel diagonally in a southeasterly direction. Wetland areas, and a section of intermittent stream were delineated coincident with this drainage feature until terminating at an excavated farm pond located near the southeast corner of the parcel. Other wetlands areas were delineated along the southern edge of the field where it meets the woodline. Location of delineated natural resources are shown in the civil design drawing package.

1.3 Downstream Waterbodies

Runoff from the Project Area drains southerly to a variety of non-jurisdictional drainages, intermittent streams, and unnamed tributaries eventually converging to Belgrade Stream and on to Messalonskee Lake which is identified by MDEP as a “Lake Most at Risk from New Development” as defined in Chapter 502.

1.4 General Topography

Two-foot contours for the entire Project Area were generated from LiDAR data provided by the Maine Office of GIS. Existing topography within the proposed development area slopes to the interior of the parcel to a drainage swale that traverses the site diagonally in a southeasterly direction. The majority of runoff is routed through a former farm pond prior to discharging offsite. Existing topography is well suited for solar development and is generally less than 15% in slope. Under post-development conditions, site drainage will generally remain the same with the exception of localized grading to conform the site to array racking tolerances and maintain positive drainage and prevent ponding within the proposed array area. Mass import or export of earthen materials is not anticipated. The access road will be graded to promote runoff from impervious

surfaces to existing vegetated areas as sheet flow. Construction and implementation of new stormwater conveyances that would result in discharging concentrated flows are not proposed. Overall the proposed site design gives preference to the natural drainage patterns and was developed to promote sheet flow over vegetated areas.

1.5 Flood Plain

The Federal Emergency Management Authority (FEMA) maintains materials developed to support flood hazard mapping for the National Flood Insurance Program (NFIP). The Project Area does not contain any land designated within a 100-year flood zone according to the Flood Insurance Rate Map (FIRM) for the Town of Belgrade, panel number 23011C0330D, revised date of June 16, 2011 (See **Attachment A**).

1.6 Alterations to Natural Drainage Ways

Construction of the proposed Project will not significantly alter natural drainage ways. A gravel access road will extend from Manchester Road to the eastern portion of the array and cross an existing drainage swale. Alignment of the proposed access road was designed to cross this feature in the location of an existing culverted fill to avoid wetland or natural resource impacts. The Project design includes accommodations to upgrade this culvert for improved hydraulic performance and installation of a culvert at the access road entrance. Calculations supporting the culverts are further described in section 5.3 below.

1.7 Alterations to Land Cover Within Watershed

The location of the proposed development currently consists of an ungrazed meadowed field. The overall watershed delineated for the Project Area also encompasses adjacent wooded areas and a single-family residence to the north of the property.

Under proposed development conditions, alterations to land cover includes the addition of gravel surfaces for the proposed access road, placement of an impervious concrete pad on a crushed stone pad for electrical equipment, and installing the solar array over the meadowed field. Ground disturbance will be minimized as much as possible and will only occur in areas necessary for installation of the proposed access road, array racking posts, equipment pad, and underground electrical conduit runs. Disturbed areas will be revegetated to further improve post-construction ground cover.

New impervious surfaces associated with the proposed development consist of the gravel access road, post-supported racking system, and equipment pad. The solar panels themselves are not considered an impervious surface with respect to stormwater runoff as they are elevated above grade. Separation between rows of panels will allow the passage of precipitation to the ground surface. The array racking posts are anticipated to consist of either steel beams (W6x8.5) with an area of approximately 2.52 square inches each or approximately 3-inch diameter ground screw foundations. Array racking requires a post approximately every 13 feet for fixed-tilt arrays. Impervious surfaces associated with the array posts are considered de minimis and negligible in terms of providing stormwater quality treatment.

Impervious surfaces within the watershed have been increased by approximately 19,375 square feet. This is due to the proposed gravel access road and equipment pad. The table below provides

a summary of land cover changes as represented by the composite runoff curve numbers (CNs) within the assessed watershed:

LAND COVER CHANGES				
SUBCATCHMENT ID	PRE-DEVELOPMENT CONDITIONS		POST-DEVELOPMENT CONDITIONS	
	CN	AREA (Ac.)	CN	AREA (Ac.)
1S	71.8	31.8	72.1	31.8

As shown in the table, changes to the land cover between pre- and post-development conditions within the delineated watershed are minimal with only a small increase in the composite CNs. A summary of the land cover types and CNs for the pre- and post-development subcatchment are provided in **Attachment B**.

2.0 Maps

2.1 Topographic Site Maps

A map of the Project boundaries overlaid on a USGS 7.5-minute topographic quadrangle map is included as **Figure 1** in **Attachment A**.

2.2 Site Specific Soils Mapping

Published NRCS soils data and mapping were utilized to support the hydrologic assessment of the Project Area. The NRCS data was used as the primary source for soils information in determining appropriate runoff curve numbers (CN) used in the runoff analysis. The hydrologic soil groups (HSGs) within the subcatchments included in the study areas are shown on the Pre- and Post-Development Watershed Plans, drawing sheets SW-1 and SW-2 respectively.

3.0 Drainage Plans

The Pre-Development Drainage Plan and the Post-Development Drainage Plan for the proposed Project are included with the Issued For Permitting drawing set. Both plans include two-foot contours, land cover types, HSGs, subcatchment boundaries and analysis points, hydrologic flow lines, existing features, and drainage ways where applicable. The Post-Development Drainage Plans include the locations of proposed roads, structures, and applicable stormwater management features.

4.0 Runoff Analysis

Stormwater runoff was estimated using HydroCAD, Version 10.0. HydroCAD software is based on methodologies developed by the United States Department of Agriculture Soil Conservation Service (USDA-SCS¹), namely *Urban Hydrology for Small Watersheds*, Technical Release 55 and Technical Release 20 (TR-55 and TR-20), in combination with other hydraulic and hydrologic calculations. Based on site specific information including subcatchment area and slopes, HSGs,

¹ Now known as the Natural Resource Conservation Service (NRCS)

land cover types, and rainfall data, the program estimates inflow and outflow hydrographs for each subcatchment and performs reach and pond routing calculations. The pre- and post-development runoff analysis calculations are provided in **Attachment B**.

The hydrologic analysis for this project consists of delineating a single subcatchment for both pre- and post-development conditions which contribute runoff to a single analysis point. The subcatchment boundary was determined from the existing and proposed contours. Runoff from the subcatchment was analyzed at the point of intersection of the respective longest hydrologic flow paths and either a subcatchment boundary, stormwater conveyance or Project Area boundary. The intent of the hydrologic analysis is to demonstrate that the changes in ground cover resulting from the Project will not adversely affect downgradient properties or natural resources. Relevant design information is shown on the Pre- and Post-development Drainage Plans, SW-1 and SW-2 respectively.

4.1 Precipitation

Design storms modeled for the pre- and post-development runoff analyses are based on the information provided in Chapter 500, Appendix H – *24-hour duration rainfalls for various return periods* for Kennebec County. Precipitation events with a 24-hour duration having a Type III distribution with return periods of 2-, 10-, 25-, and 100-years. Rainfall depths for these events are 2.8, 4.2, 5.2, and 7.2 inches respectively.

4.2 Runoff Curve Numbers

A summary of the land cover types, hydrologic soil groups (HSGs), and runoff curve numbers (CNs) for the pre- and post-development subcatchments are provided in the stormwater calculation package in **Attachment B**. Cover types for the impacted areas were determined from the natural resource field surveys, a site visit, and publicly available aerial imagery.

The soil types and HSG information for the Project Study Area are based on NRCS soil maps. The HSGs within the runoff analysis areas are shown on the Pre- and Post-Development Watershed Plans (**Attachment A**).

The CNs were selected from HydroCAD software which incorporates a complete curve number lookup table based on the data developed by the NRCS and published in TR-55, based on the observed cover types and hydrologic soil groups.

4.3 Time of Concentration Calculations

Times of concentration were calculated using NRCS TR-55 methodologies considering the hydrologic flow lengths, slope, land cover type, and surface roughness. The type and length of each flow line segment determining travel times in the area to be developed are indicated on the pre- and post-development drainage plans. A maximum sheet flow length of 100 feet was used for this analysis. Shallow concentrated flow was used for portions of the flow path beyond 100 feet extending until a channel, culvert, or subcatchment boundary was encountered. For each subcatchment, the travel times were summed to determine the time of concentration, which was then input directly into HydroCAD. The calculation spreadsheets are included with the calculations in **Attachment B**.

5.0 Stormwater Quantity Treatment Plan – Flooding Standard

5.1 Peak Discharge Calculations

Peak discharge calculations are included in the HydroCAD output. A single analysis point was assessed under both pre- and post-development conditions. Results of the pre- and post-development runoff analyses are shown and compared in the table below.

ANALYSIS POINT: DP-1				
DESIGN STORM	PRE-DEVELOPMENT		POST-DEVELOPMENT	
	RUNOFF VOL. (AF)	RUNOFF RATE (cfs)	RUNOFF VOL. (AF)	RUNOFF RATE (cfs)
2-Year, 24-hour	1.834	9.30	1.834	9.37
10-Year, 24-hour	4.246	23.80	4.246	23.95
25-Year, 24-hour	6.237	35.68	6.237	35.98
100-Year, 24-hour	10.603	61.32	10.603	61.91

The analyses demonstrate that peak volumes and rates of runoff under post-development conditions are almost identical to pre-development conditions for the assessed watershed. The peak volumes remain constant and there is a minimal difference between the peak runoff rates but the difference is less than 1 percent. These results are due to the minimal changes in land cover in the proposed post development conditions and a negligible increase in impervious area.

5.2 Variance Submissions

A variance from the peak flow standard is not necessary for the Project. The proposed plan of development generally maintains existing hydrology and drainage patterns and will not adversely affect downstream properties.

5.3 Calculations for the Sizing of Proposed Culverts and Stormwater Basins

Stormwater basins are not required for runoff treatment or attenuation; however, the Project will include the installation of two new culverts, one at the access road entrance and one to replace an existing culvert at a swale crossing. The culvert at the swale crossing conveys flows from an existing drainage swale and will allow the proposed access road to cross the drainage swale with limited impacts to wetlands and natural resources. The following table provides a summary of the proposed culverts. Calculations supporting the sizing of the culverts are provided in the Post-Development HydroCAD model included in **Attachment B**.

CULVERT SUMMARY				
CULVERT ID	DRAINAGE AREA (AC.)	CULVERT DIA (IN.)	PEAK FLOW RATE (CFS) 25-YR STORM	DISCHARGE VELOCITY (FPS)
SD-1	0.129	15	0.32	2.32
SD-2	6.868	24	10.63	3.85

The inlet and outlet of the culvert at the access road entrance will be armored and stabilized with rip-rap aprons in accordance with the detail on the civil construction details sheet of the Project Drawings. Armoring with D₅₀=6-inch stone will provide sufficient velocity dissipation to prevent erosion. The inlet and outlet of the culvert at the swale crossing will maintain existing conditions to avoid wetland or natural resource impacts. The proposed culvert at this location has an increased diameter compared to the existing culvert. As a result, the discharge velocities will be reduced. Existing conditions at the inlet and outlet are stable so they are anticipated to adequately manage the reduced velocities from the proposed culvert and prevent erosion.

5.4 Infiltration Systems

No infiltration systems are proposed for the Project.

5.5 Drainage Easement Declarations

The proposed stormwater features are located entirely on lands that are or will be under control of Solar Fields for the entire lifecycle of the Project. Therefore, the development will not require the establishment of drainage easements.

6.0 Stormwater Quality – Phosphorus Control Plan

In order to limit the impact of the proposed development on lake water quality, a Phosphorus Control Plan has been prepared and associated control measures have been provided for in the Project design. The Town of Belgrade Commercial Development Review Ordinance requires that a phosphorus control plan be provided if a proposed development consists of more than 15,000 square feet of disturbed area, 7,500 square feet of impervious area, or construction of new roads/driveways in excess of 250 feet. The Project exceeds the thresholds of the Town's "Simplified Phosphorus Method"; therefore, the Phosphorus Control Plan has been prepared in accordance with the Maine Stormwater Management Design Manual, Volume II – *Phosphorus Control Manual* ("MDEP Phosphorus Control Method"), dated March 2016.

6.1 Watershed Per-Acre Phosphorus Allocation

Runoff from the Project Area drains southerly to a variety of non-jurisdictional drainages, intermittent streams, and unnamed tributaries eventually converging to Belgrade Stream and on to Messalonskee Lake. The allowable phosphorus allocation for the Messalonskee Lake Watershed in the Town of Belgrade is 0.068 lb/acre/yr, as specified in the Town's ordinance and the MDEP Phosphorus Control Method, Appendix C – *Per Acre Phosphorus Allocations for Selected Maine Lakes*, updated November 1, 2017.

6.2 Project Phosphorus Budget

The Project's phosphorus budget (PPB) is the maximum amount of algal available phosphorus which may be exported from the proposed development. The PPB is 1.646 pounds of phosphorus per year, as determined from the calculations provided in the MDEP Phosphorus Control Method, Appendix D, Worksheet 1. As part of the calculation, the acreage of developable land is determined by subtracting the footprints of wetlands and sustained slopes greater than 25% from the total area of the parcel to be developed. The Project did not qualify for the small watershed adjustment which is available for large projects located in relatively small watersheds.

6.3 Project Phosphorus Export

To determine the phosphorus control measures that should be provided with the proposed development in order to meet the PPB, the Project phosphorus export (PPE) is calculated using the MDEP Phosphorus Control Method, Appendix D, Worksheet 2. The pre-treatment PPE is determined based on the land surface types and associated acreage for the proposed development and the phosphorus export coefficients for each land surface type. Table 3.1 of the MDEP Phosphorus Control Method were used to determine the export coefficients since the Project is a commercial development. The total pre-PPE is estimated at 0.713 pounds per year. The pre-PPE is less than the PPB by approximately 0.933 pounds per year; however, stormwater best management practices (BMPs) are still being proposed to further reduce the PPE to accommodate potential future property developments.

6.4 Phosphorus Control Measures

BMPs are used to remove phosphorus from the stormwater before it leaves the Project site and can include phosphorus control measures such as vegetated buffers, wet ponds, soil filters, and infiltration beds. For this Project, a vegetated buffer is being proposed as shown in the Site Grading & Drainage Plan included with the Issued For Permitting drawing set. Worksheet 2 continues to be used to calculate the post-PPE by applying treatment factors for the selected BMPs. The total post-PPE is estimated at 0.586 pounds per year which further reduced the PPE below the PPB by approximately 1.06 pounds per year. The Project is proposing to fully meet the PPB by incorporating BMPs into the design. As a result, mitigation credits for pre-existing sources are not required.

The calculation spreadsheets, including a PPE summary spreadsheet using the MDEP Phosphorus Control Method, Appendix D, Worksheet 4, are included in **Attachment B**.

6.5 Engineering Inspection for Stormwater Management Facilities

Solar Fields ensures that a qualified engineer or professional (a Professional Engineer (PE), a Certified Professional in Erosion and Sedimentation Control (CPESC), or similar specialist) will inspect the construction site periodically to verify that construction is completed in accordance with the details and specifications shown on the civil design drawings, and that proposed structures are functioning as designed. These inspections will commence with the initial earth-disturbing activities on the site and will continue, as needed, during any period when construction activity affecting the stormwater management system occurs, and until the site is permanently stabilized.

Additional inspections of the site will be conducted during and after construction to evaluate and maintain the condition and effectiveness of erosion and sedimentation control measures. BMPs for erosion control and stormwater pollution prevention will be inspected weekly (at a minimum) and after significant (e.g., >0.5") rain events throughout construction. Maintenance of temporary and permanent controls will be completed as needed and to correct any observed erosion or sedimentation. The inspection and maintenance of erosion control measures and phosphorus control measures are described in more detail in Section 7.0.

7.0 Erosion & Sedimentation Control – Basic Standards

This plan has been developed based on good engineering practices, generally accepted industry standards, and in accordance with the guidance provided in the “Maine Erosion and Sediment Control Best Management Practices Manual for Designers and Engineers” (MDEP, Rev. October 2016²).

7.1 Project Schedule

Construction of the Project is tentatively scheduled to commence in the spring of 2021 with the intent of being fully operational by the end of the 2022 calendar year. Currently, the total Project duration is anticipated to be approximately 4 months.

Additionally, specifics of how work is completed will be based on environmental considerations associated with seasonal changes. The following dates are provided to establish a general guideline for these seasons:

- Winter: November 1 to March 19
- Mud Season: March 20 to April 30
- Spring: May 1 to June 21
- Summer: June 22 to September 21
- Fall: September 22 to October 31

7.2 Erosion and Sediment Control Measures

The contractor shall utilize the following general measures and practices throughout construction and development of the Project:

- Erosion and sedimentation control BMPs shall be implemented prior to commencing earth disturbing activities;
- Phase construction activities as practicable to minimize the area and duration bare soils are exposed;
- Route all construction traffic through approved points of access and egress and over stabilized construction entrances;
- Only areas of active construction shall remain un-stabilized or unvegetated;
- Protect and maintain identified buffer areas throughout construction;
- Continuously maintain and inspect installed BMPs; and
- Double rows or paired BMP systems shall be implemented to protect critical areas.

Whenever practicable, no disturbance activities should take place within 50 feet of any protected natural resource. If disturbance activities take place upgradient to and between 30 feet and 50 feet of any protected natural resource, perimeter erosion controls must be doubled. If disturbance activities take place upgradient to and less than 30 feet from any protected natural resource, perimeter erosion controls must be doubled and disturbed areas must be temporarily or permanently stabilized within 7 days.

² Available online: http://www.maine.gov/dep/land/erosion/escbmps/esc_bmp_engineers.pdf

7.2.1 Temporary Measures

The following temporary erosion control BMPs are proposed and/or are likely anticipated to be needed during construction and development of the Project:

- **Stabilized Construction Entrance:** As indicated on the civil design drawings, stabilized construction entrances will be required at each point of ingress/egress. These features will be of significant importance at intersections with public roads. Construction entrances shall have a minimum length of 50 feet and an appropriate width (minimum of 12 feet) to fully contain anticipated construction vehicles. Construction entrances shall be constructed of a 6-inch thick layer of 2-inch angular crushed stone underlain by a woven geotextile fabric. A diversion ridge shall be required at the bottom of slopes exceeding 5% to intercept runoff. Berms may be necessary to divert runoff from the construction entrance to a temporary sediment trap. Under extremely wet conditions or during the mud season, a standard construction entrance may not be sufficient to fully remove sediment from vehicle tires and prevent tracking. In these instances, a construction entrance may either be lengthened as necessary or a wheel washing procedure shall be employed. Stabilized construction entrances shall be inspected on a weekly basis and prior to and immediately following significant rain events (those exceeding 0.5-inches in 24-hours). Tracked mud or sediment shall be removed prior to the next rain event. Periodic replacement of the stone material may be required as sediment accumulates and fills the voids.
- **Dust Control:** Measures to control creation and migration of nuisance dust shall be implemented throughout construction. Primary travel ways and laydown areas shall be surfaced with base gravel or coarse gravel as soon as possible to minimize the creation of dust. Traffic control shall be implemented to reduce speeds and restrict traffic. Frequently traveled surfaces shall be periodically watered to reduce dust. Areas that become a significant source of dust may be treated with calcium chloride to reduce frequency of watering. Paved surfaces shall be vacuum swept when dry.
- **Erosion Control Mix:** Erosion control mix (ECM) mulch may be utilized to stabilize slopes, frozen ground, forested areas, or to provide immediate stabilization without waiting for vegetation to establish. ECM shall be placed at a minimum thickness of 2 inches on slopes of 3H:1V or flatter. Slopes steeper than 3H:1V require a minimum of 4 inches. ECM shall be evenly distributed by hand, excavator bucket, or pneumatic blower. ECM alone is not suitable in areas of groundwater seepage, converging flows, or low-lying areas where ponding is expected.
- **Erosion Control Mix Berms:** Erosion control mix berms shall be lightly compacted or bucket-tamped to minimize large voids within the filter media. Berms shall be a minimum of 12-inches tall and 2 feet wide. Condition of erosion control berms shall be continuously monitored throughout construction and replaced or repaired as necessary.
- **Silt Fence:** Silt fence shall be installed in an alignment that follows the contour as much as practicable. Stakes shall be anchored a minimum of 12-inches into the ground and the bottom flap of the geotextile fabric shall be keyed in a 6-inch by 6-inch trench excavated on the upgradient face of the fence line. Trench shall then be backfilled with compacted native materials and compacted. When joints are necessary, the fabric shall be spliced by wrapping end stakes together.
- **Straw Bale Barrier:** Straw bales are intended for use as a sediment barrier when the contributing drainage area is small or where site conditions prevent installation of more substantive measures. Their use may also be necessary as a secondary form of protection when paired with another sediment barrier (i.e., silt fence) to further protect

critical areas or as an emergency measure for controlling unexpected sedimentation until a permanent BMP can be implemented. When installed, straw bales should be entrenched a minimum of 4-inches and anchored with 2 stakes per bale. Gaps between adjacent bales should be chinked with straw to prevent flow between the bales. Overtime straw bales will degrade and deteriorate and will require frequent inspection and periodic replacement. Due to their versatility and ability for rapid deployment during an emergency situation, it is recommended that a supply of straw bales be maintained on site at all times.

- Compost Filter Sock: Compost filter sock can be purchased from a commercial manufacturer or field-built from nonwoven geotextile fabric and processed ECM or other finely shredded material (i.e., coconut fiber, etc.). Compost filter sock can be a useful sediment barrier for small drainage areas or where trenching for silt fence is not possible (i.e., pavement). Compost filter socks shall be installed so that complete contact with the ground is achieved across the entire length. Staking will be necessary on steeper slopes. Once stabilization is achieved compost filter socks can be cut open and the filter material can be spread in place.
- Topsoil Stockpile: All topsoil stripped from work areas shall be stockpiled onsite for future use. Areas chosen for topsoil stockpiling shall be dry and stable. Stockpiles shall have a maximum slope of 2H:1V and be completely surrounded by perimeter sediment barriers (i.e., silt fence, filter socks, etc.). Once constructed, stockpiles shall be stabilized with seed and mulch for permanent stabilization or covered as temporary stabilization.
- Stone Check Dams: Stone Check dams may be necessary in existing or proposed upland swales and ditches to reduce flow velocity and promote sedimentation prior to final discharge of runoff. Reduction in flow velocity will serve to reduce rilling in flow paths and promote establishment of vegetation. Stone for check dams shall be comprised of well-graded crushed stone, from one to six inches in diameter. The core of the check dams shall be keyed into the trench line to prevent undermining. Check dams shall be spaced so that the top of the downgradient check dam is at the same elevation as the toe of the preceding check dam.
- Concrete Washout: Concrete washout(s) shall be sized to contain all wash water and solids without overflowing. A below-grade washout shall be sized to contain all liquid wastes with 4 inches of freeboard. Access to the washout shall be stable and secure. A washout facility shall not be placed within 50 feet of a storm drain or discharge point unless the containment is lined with anchored plastic sheeting (10-mil min. thickness) and is not allowed to overflow. Inspect washouts daily to assess usage and identify leaks. Dispose of solids appropriately.
- Temporary Mulching: Temporary mulching shall be applied to areas not yet prepared for permanent stabilization but that have been or shall be inactive for a maximum of 7-days. Temporary mulching shall consist of spreading straw mulch or erosion control mix across bare soil. Erosion control blankets or other methods may be substituted for areas where temporary mulching has proven to be ineffective. Areas of temporary mulching shall be inspected weekly and before and after significant storm events (greater than 0.5-inches in 24hrs). Temporary mulch application rates shall be doubled from November 1 through April 15.

7.2.2 Permanent Measures

The following erosion control BMPs are proposed to be used during construction and shall remain in-place after Project completion and be maintained throughout operation of the facility:

- **Erosion Control Blanket:** Erosion control blanket (ECB) shall be utilized on disturbed slopes steeper than 3H:1V, vegetated swales or ditches, to stabilize the array drip edge as necessary, and areas where immediate stabilization is desired. ECB shall be installed on prepared soils in a manner such that complete contact with the subgrade is achieved. ECB shall be anchored with ground staples in accordance with the manufacturer's recommendations and aligned parallel to slopes.
- **Gravel Roads:** Roads shall be constructed with a crown or super-elevated as indicated on the design drawings to ensure runoff is delivered immediately to adjacent stabilized areas. Roadways shall be aligned in general conformance with those shown on the design drawings and constructed of specified aggregate base and subbase materials. Roadways shall be inspected for rutting, washboarding, and other signs of erosion. Installation of water bars, french drains, or other features may be necessary depending on conditions observed in the field and as directed by the Engineer during construction.
- **Vegetative Stabilization:** Seeding and mulching for final stabilization shall be completed as soon as practicable and phased throughout construction. All areas achieving final grades or topsoil placement shall be seeded and mulched within 7 calendar days. Areas of final stabilization shall be clearly marked in the field and protected so as to prevent damage from construction vehicle traffic. Areas shall be inspected throughout construction and at a minimum of monthly after Project completion until 90% vegetative growth is achieved. The following tables provide a summary of permanent mulch and seeding requirements.
- **Vegetated Buffers:** The vegetated buffers are designed to provide long-term stormwater treatment and erosion and sedimentation control. Upgradient runoff not intended for the buffers shall be diverted away through the proposed access road culvert. Upon completion of Project construction, the vegetated buffers will be inspected, and any eroded areas will be repaired as directed by the Engineer.

Table 7.1. Mulch application rates

SUMMARY OF TEMPORARY AND PERMANENT MULCH APPLICATION REQUIREMENTS			
CONDITION	TIMING	MULCH TYPE ²	APPLICATION RATES
Temporary			
Inactive Areas	If no activity in exposed areas for 7 days, or prior to a predicted storm event.	Straw Mulch ¹ , Wood Fiber Mulch Erosion Control Mix	2 tons/acre 1 ton/acre 2" thick over area
All Disturbed Areas of the Construction Workspace	Apply mulch to all exposed areas if no activity occurs within 30 days. Apply mulch and temporary seeding sooner when it can be anticipated that activity is not going to occur within 30 days.	Straw Mulch Wood Fiber Mulch	2 tons/acre 1 ton/acre ³
All Work Areas Exposed Are To Be Mulched Each Time Soil Is Disturbed ⁵	November 1 through April 15	Straw Mulch Wood Fiber Mulch	4 tons/acre 2 tons/acre
Permanent			

On all Exposed Areas After Seeding To Stabilize the Soil Surface	Permanent grass and/or legume seeding covered by hay or straw mulch on all areas that have been restored to final grade. This does not apply to areas stabilized by other means such as ECB or permanent ECM.	Crimped Straw Mulch Paper Mulch Wood Fiber Mulch	2 tons/acre 1500lbs/acre ⁴ 1 ton/acre
Wood Chip Application Areas ⁶	Permanent grass and/or legume seeding covered by hay or straw mulch on all areas that have been restored to final grade. This does not apply to areas stabilized by other means such as ECB or permanent ECM.	Crimped Straw Mulch Paper Mulch Wood Fiber Mulch	2 tons/acre 1500lbs/acre ⁴ 1 ton/acre

Notes:

1. Straw and hay mulch may be used interchangeably, except in wetland areas where straw mulch will be required.
2. Double the rate of wood fiber mulch when used in or adjacent to critical areas. Increase mulch rate by half under solar array drip edge.
3. Straw, hay, or hydraulic mulch shall provide a minimum of 90% ground cover.
4. Paper mulch is acceptable for use during the growing season only. On slopes greater than 30% and in areas where vegetation has no established well, additional hay mulch will be added as a winterizing measure.
5. Mulch may not be spread on top of snow.
6. Woodchips shall be applied at a maximum thickness of 4 inches and only in upland areas.

Table 7.2. Seed mixes

SEED MIX SPECIFICATIONS		
SEEDING PLAN AND SEED MIX	SEED MIX COMPONENTS	LB./ACRE
Temporary Seeding		
Uplands: Annual Ryegrass	-	40
Permanent Seeding		
Uplands: New England Logging Road Mix (New England Wetland Plants) <i>or similar if approved</i>	Native Grasses, Rushes and Forbs	20
Designated Pollinator Planting Areas: New England Conservation/Wildlife Mix (New England Wetland Plants) <i>or similar if approved</i>	Native Grasses, Rushes and Wildflowers	35
Woodchip Application Areas: New England Logging Road Mix (New England Wetland Plants) <i>or similar if approved</i>	Native Grasses, Rushes and Forbs	20
Wetlands: None	-	NA
Supplemental Winter Seed Mix: Winter Ryegrass	-	120

Notes:

1. Increase seeding rates by 10% when hydroseeding.
2. Winter rye will be added to permanent upland mix at a rate of 120lb/acre between October 1 and April 15.

Table 7.3. Seeding requirements

SUMMARY OF SEEDING REQUIREMENTS		
CONDITION	TIMING	SEED MIX
Temporary Seeding	Between April 15 and October 1 Only. Disturbed areas or soil stockpiles will be seeded immediately if further disturbance is not expected for 30 days or more.	Annual Ryegrass
Permanent Seeding		
Upland Areas	Exposed soils to be seeded within 7 days of final grading and topsoil placement	Permanent Upland Mix
Slopes > 3H:1V	Seeded immediately after seedbed preparation	Permanent Upland Mix
Wetlands	No disturbance or seeding in wetlands	NA
Woodchip Application Areas	Seeded within 7 days of final grading and topsoil placement	Woodchip Application Seed Mix
Winter Dormant Seeding	Seeded within 7 days of final grading and topsoil placement	Permanent Upland + Winter Rye
Buffer Areas	Seeded immediately after seedbed preparation	Permanent Upland Mix

Notes:

1. Timing: Weather conditions permitting.
2. Areas that do not successfully revegetate within appropriate period of time will be reseeded as necessary.
3. Scarify compacted surfaces to a minimum depth of 4-inches.
4. Top dress with 4 to 6 inches of loam, as needed.

7.2.3 Erosion Control Measure Removal

The removal and disposal of erosion and sedimentation control measures shall be the responsibility of the Contractor. BMPs shall remain in-place until a minimum of 90% cover of vegetation has been achieved or other permanent measures of stabilization are installed (i.e., rip-rap, erosion control mix, etc.). Sediment trapped in front of perimeter sediment barriers shall be spread within an area undergoing final grading and distributed in a uniform manner conforming to local topography, and then seeded and mulched. Erosion control berms and compost filter socks may be demolished, and the erosion control mix filter media may be evenly distributed across the adjacent areas.

7.3 Overwinter Construction

The following general practices and procedures should be utilized during any construction occurring over the winter season and through April 15:

- Exposed areas should be limited to those where work will occur within the next 14 calendar days;
- Exposed areas should not exceed the limit of what can be mulched in one day (prior to predicted precipitation);
- At the end of each construction day, areas that have been brought to final grade must be stabilized; Where frozen ground prevents installation of silt fence or ground penetrating sediment barriers, the Contractor shall request an appropriate detail modification from the Engineer;
- Permanent seeding shall not be attempted, unless a dormant seeding application method is approved by the Engineer;
- All areas within 75 feet of a protected natural resource must be protected with a double row of sediment barriers; and

- All vegetated ditch lines that have not been stabilized by November 1, or will be worked on between November 1 and April 15, must be stabilized with stone lining backed by gravel bed or geotextile as specified by the Engineer.

7.4 Housekeeping

As an authorized agent of the Applicant, the Contractor shall maintain the Project site in accordance with the following performance standards and housekeeping practices:

Spill Prevention: Controls shall be in place to prevent pollutants from being discharged from materials used and stored onsite. Appropriate controls include, but are not limited to, proper storage practices that minimize exposure of materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.

Groundwater Protection: During construction, the Contractor may not store or handle liquid petroleum products and other hazardous materials with the potential to contaminate groundwater in areas of the Project sites draining to an infiltration area or within 100 feet of a critical resource area or stream. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storing and handling liquid hazardous materials.

Fugitive Sediment and Dust: During construction, the Contractor shall take all necessary actions to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Operations during dry months, that experience fugitive dust problems, should wet down unpaved access roads once a week or more frequently as needed with a water additive. Oil may not be used for dust control. The Contractor shall monitor vehicles entering and exiting the Project site for evidence of tracking mud onto public or private roadways outside the work area. If necessary, the Contractor shall provide a means for sweeping and cleaning road areas experiencing tracking. If off-site tracking occurs on public roads, they should be swept immediately and no less than once a week and prior to significant storm events. During the mud season, it may be necessary to increase the size of stabilized construction entrances or provide a wheel washing station.

Debris and Other Materials: The Contractor shall manage all litter, construction debris, and construction chemicals exposed to stormwater to prevent materials from becoming a source of pollution.

Trench or Foundation Dewatering: Trench dewatering is the removal of water from trenches, foundations, coffer dams, ponds, sumps, basins, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The Contractor shall remove collected water from the ponded areas, either through gravity or by pumping, in a manner that spreads effluent through natural wooded buffers or to areas that are specifically designed to collect the maximum amount of sediment possible (i.e., cofferdam sediment basin or dirt-bag). The Contractor shall avoid practices that allow sediment laden water from dewatering to flow over disturbed areas of the Project site. Other measures or methods may be utilized as reviewed and approved by the Engineer and, if necessary, the MDEP. A typical detail for standard dewatering practices is provided on the civil design drawings.

Non-Stormwater Discharges: The Contractor shall identify and prevent contamination by unauthorized non-stormwater discharges. Unauthorized stormwater discharges include, but are

not limited to, wastewater from concrete washout, fuels or hazardous substances, and detergents used in vehicle and equipment washing.

7.5 Inspection & Maintenance

The Contractor shall bear the responsibility of installation, maintenance, and day to day monitoring, repair, and replacement of erosion and sedimentation control measures throughout the entire duration of the Project. It is the responsibility of the Contractor to ensure installed measures are effective and functioning as designed. Inspections may indicate additional or more substantive measures are required.

At a minimum, inspections shall be conducted on a weekly basis and within 24-hours of a significant rain event (>0.5" in 24-hours). Inspections shall be documented in site inspection reports that are kept on the Project site at all times. An example inspection report template is provided as **Attachment C**. A copy of the site inspection reports shall be retained by Solar Fields for a period of at least three years from the completion of permanent stabilization.

Presence of a third-party inspector does not relieve the Contractor of inspection and reporting responsibilities.

7.6 Erosion & Sedimentation Control Conclusion

In the event that a situation arises that is not specified above or depicted on the civil design drawings, the Contractor shall follow the guidance of "Maine Erosion and Sediment Control Best Management Practices Manual for Designers and Engineers" (MDEP, Rev. October 2016). If the Project is phased and constructed in accordance with the specifications and requirements of the civil design drawings and basic standards listed above, the Project will not result in significant erosion or sedimentation.

8.0 Post-Construction Stormwater Maintenance Plan

The Project will be owned, operated, and maintained solely by Solar Fields. During construction, the site will be periodically inspected by a qualified engineer or professional (PE, CPESC, or similar specialist) to ensure the work is being conducted in accordance with the civil design drawings and the erosion and sedimentation control plan, and that applicable features are functioning as designed. Once permanent stabilization is achieved, the Project will be operated by a qualified maintenance representative who will be responsible for inspection and maintenance of the entire grounds and stormwater management features.

8.1 Facilities to be Maintained

The stormwater management features to be maintained at the Project include:

- Access Roadway;
- Culverts;
- Vegetated Buffers; and
- Revegetated Areas and Embankments.

8.2 General Inspection and Maintenance Requirements

Generally, the proposed facility will be operated and maintained in a manner consistent with good utility practices, including a minimum of biannual (spring and fall) onsite inspections and maintenance of stormwater management system components, as needed. A post-construction maintenance and inspection log will be completed as part of the quarterly onsite inspections, refer to **Attachment C** for a template of this inspection log. A copy of the log shall be retained by Solar Fields for a period of at least five years from the completion of permanent stabilization.

Potential maintenance concerns associated with specific areas and facilities at the facility are discussed in the following paragraphs.

8.3 Access Roadway

The access roadway will typically require little on-going maintenance, owing to their primary and limited use by light-duty vehicles. These areas will be inspected quarterly, and signs of existing or developing erosion, rutting, trash or unwanted vegetation will be removed/repared as needed. Additionally, shoulders shall be inspected for low spots or evidence of channelized flow and false ditching. Repair/maintenance shall be completed as necessary to ensure runoff from the roadways is conveyed as sheet flow to the downgradient stabilized areas.

8.4 Culverts

Culverts shall be inspected on a quarterly basis. Evidence of erosion or sedimentation at the inlet and outlet aprons shall be repaired as necessary. Signs of heaving, reduced cover, blockage/clogging, or piping shall be monitored, recorded, and repaired when necessary.

8.5 Vegetated Buffers

The vegetated buffers will be inspected quarterly to ensure the integrity of the vegetated surface and that runoff is being conveyed as well-distributed sheet flow. Any signs of existing or developing erosion, rutting, debris, or unwanted vegetation within the vegetated buffer will be removed/repared as needed.

8.6 Revegetated Areas and Embankments

Revegetated areas and embankments will be inspected quarterly. Any signs of erosion or inadequate revegetation of these areas will be corrected as needed.

8.7 Re-certification

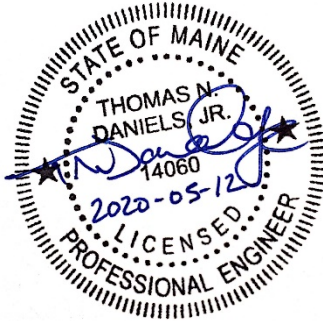
As required in Chapter 500, re-certification will be required for each five-year interval from the date of issuance of the permit. The Owner shall submit certification of the following items within 3-months of the expiration of each permit interval:

- All areas of the Project site have been inspected for evidence of erosion, and all areas of identified erosion have been permanently stabilized.
- All aspects of the permanent stormwater management system (i.e., culverts, buffer areas) have been inspected for evidence of damage, wear, and malfunction, and that all necessary steps have been taken to repair or replace the system, or portions of the system.

- The erosion and stormwater management plan for the Project is being implemented as written, or modifications to the plan have been submitted to and approved by the Department, and the maintenance log is being maintained.

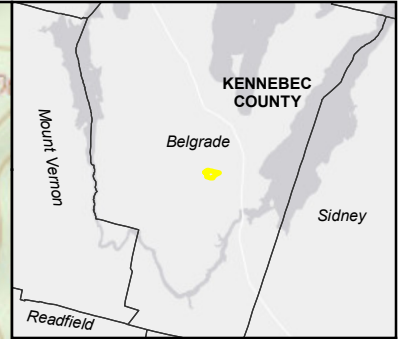
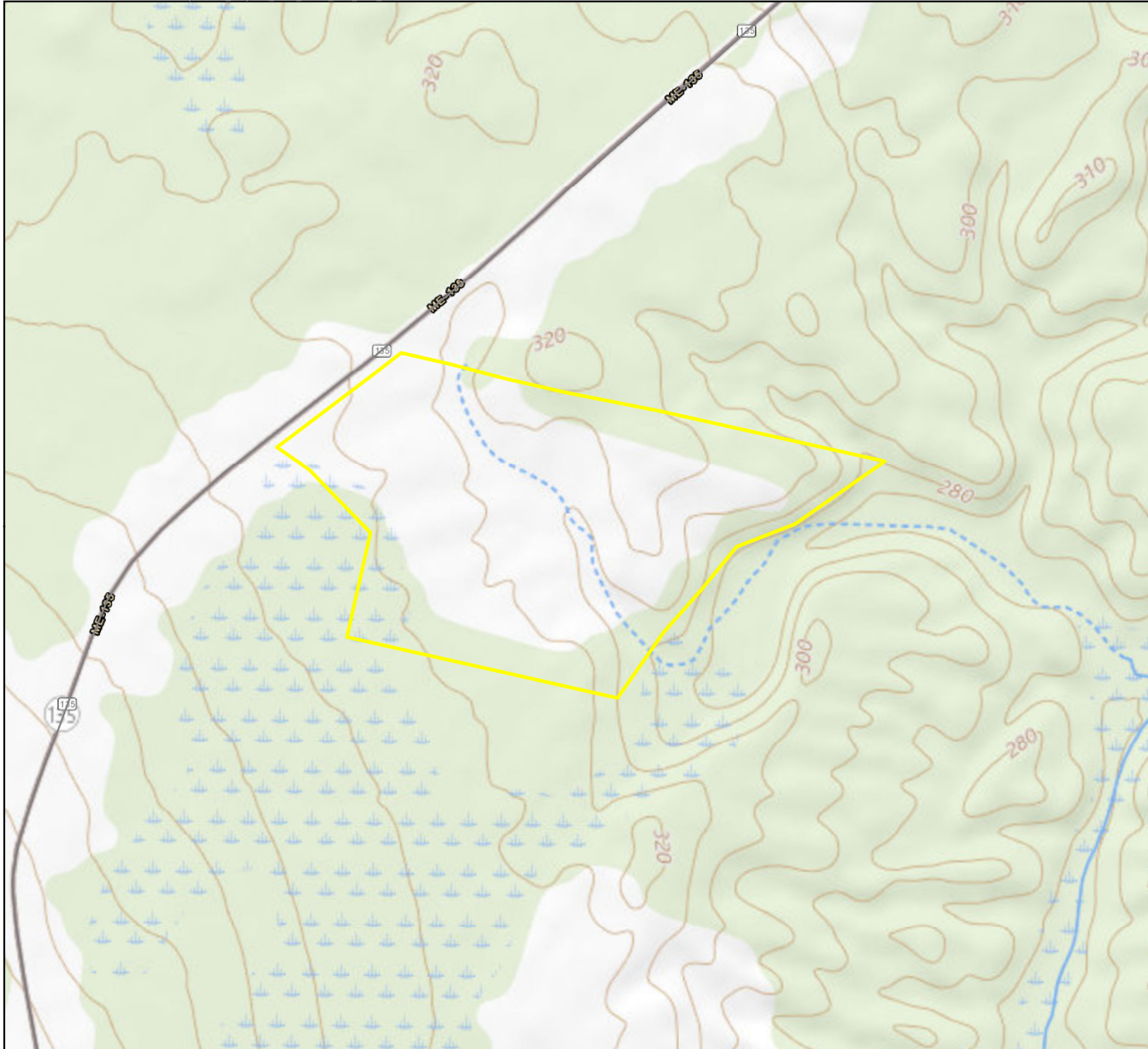
9.0 Certification – Professional Engineer

This stormwater report and the following attachments have been completed by me or under my direct supervision.



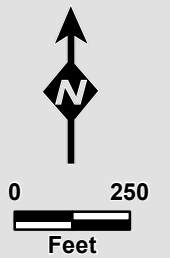
Thomas N. Daniels, TRC Environmental, Inc.
Maine-Registered PE # 14060

Attachment A: Figures & Maps



Legend

Project Boundary



**Solar Fields
Belgrade Solar Project**
Kennebec County, Maine

Site Topography

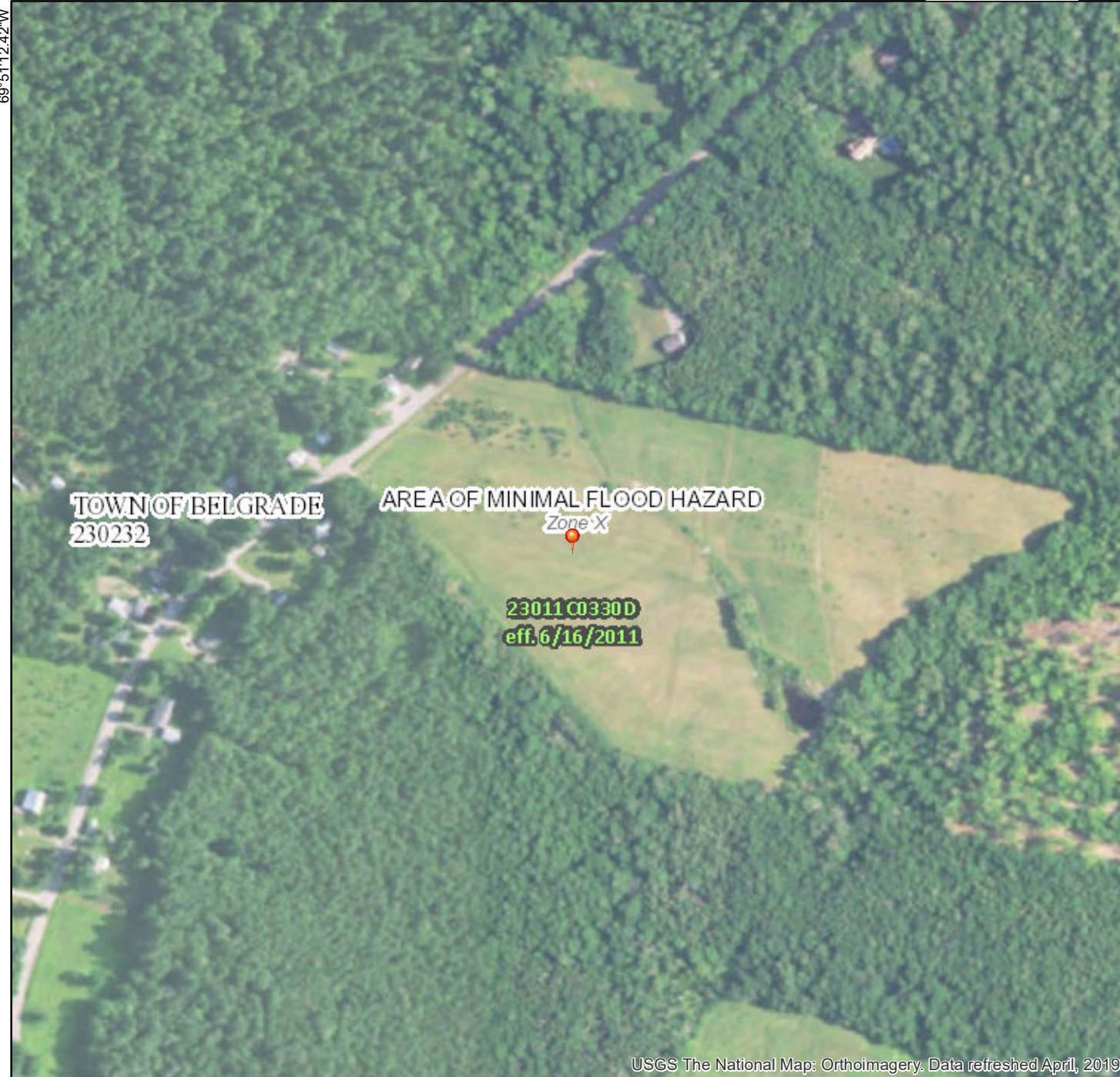


14 Gabriel Drive
Augusta, ME 04330

National Flood Hazard Layer FIRMette



44°27'39.66"N



USGS The National Map: Orthoimagery. Data refreshed April, 2019.

0 250 500 1,000 1,500 2,000 Feet 1:6,000

44°27'13.98"N

Legend

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

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped
		The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.



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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **4/14/2020 at 4:18:32 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

Attachment B: Stormwater Calculations



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 **Kennebec County, Maine**

**Solar Fields - Parker Station,
Manchester Road, Belgrade, ME**



April 14, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

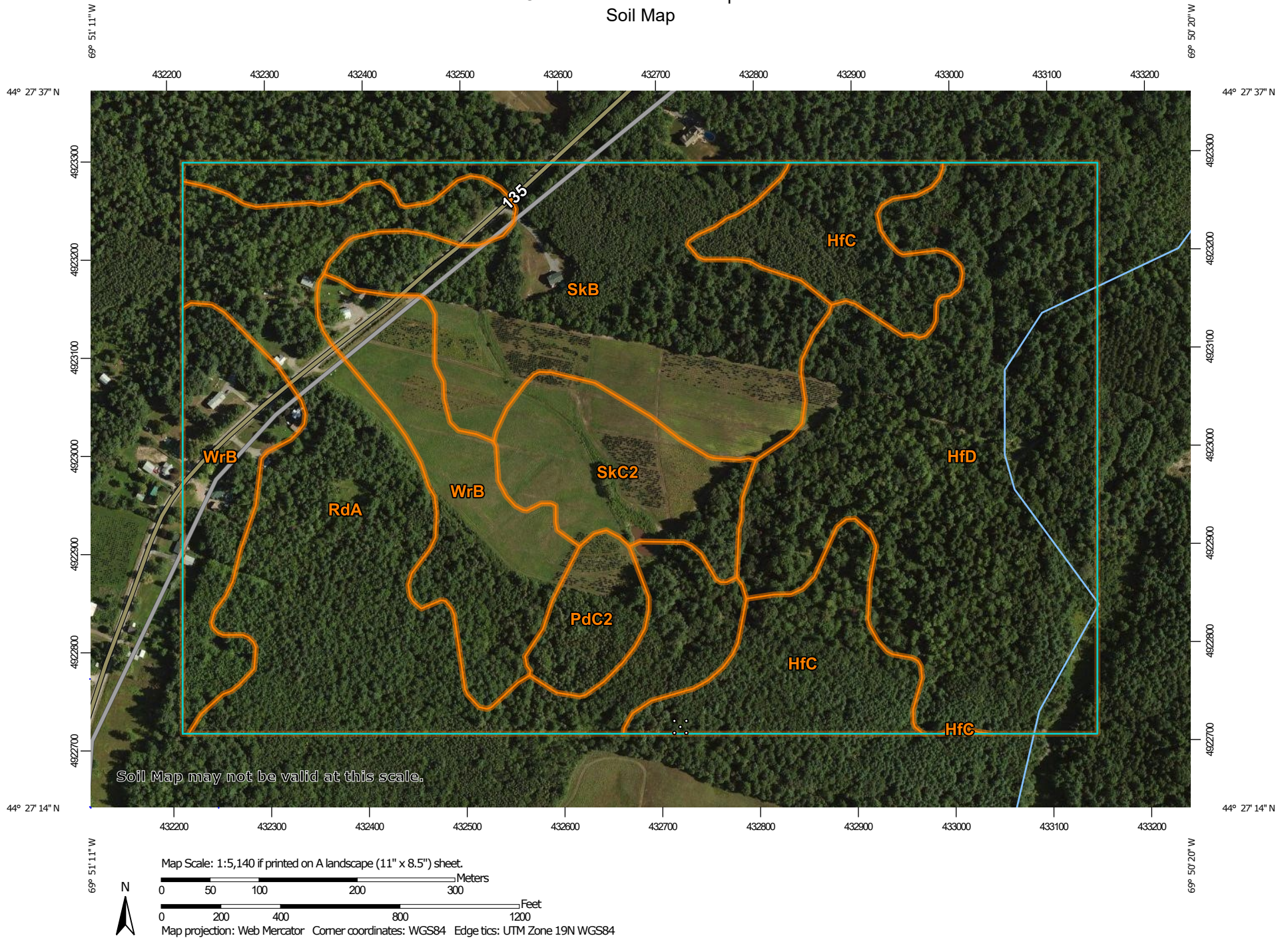
Contents

Preface	2
Soil Map	5
Soil Map.....	6
Legend.....	7
Map Unit Legend.....	8
Map Unit Descriptions.....	8
Kennebec County, Maine.....	10
HfC—Hartland very fine sandy loam, 8 to 15 percent slopes.....	10
HfD—Hartland very fine sandy loam, 15 to 25 percent slopes.....	12
PdC2—Paxton-Charlton fine sandy loams, 8 to 15 percent slopes, eroded.....	14
RdA—Ridgebury very stony fine sandy loam.....	16
SkB—Scio very fine sandy loam, 3 to 8 percent slopes.....	18
SkC2—Scio very fine sandy loam, 8 to 15 percent slopes, eroded.....	20
WrB—Woodbridge fine sandy loam, 3 to 8 percent slopes.....	21

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



Custom Soil Resource Report

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 1:20,000.

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: Kennebec County, Maine
Survey Area Data: Version 18, Sep 16, 2019

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

Date(s) aerial images were photographed: Jul 17, 2010—Aug 31, 2010

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HfC	Hartland very fine sandy loam, 8 to 15 percent slopes	14.5	10.7%
HfD	Hartland very fine sandy loam, 15 to 25 percent slopes	36.4	26.9%
PdC2	Paxton-Charlton fine sandy loams, 8 to 15 percent slopes, eroded	3.3	2.5%
RdA	Ridgebury very stony fine sandy loam	29.8	22.0%
SkB	Scio very fine sandy loam, 3 to 8 percent slopes	25.5	18.9%
SkC2	Scio very fine sandy loam, 8 to 15 percent slopes, eroded	8.0	5.9%
WrB	Woodbridge fine sandy loam, 3 to 8 percent slopes	17.5	13.0%
Totals for Area of Interest		135.1	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.

Kennebec County, Maine

HfC—Hartland very fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9k04

Elevation: 10 to 2,200 feet

Mean annual precipitation: 30 to 48 inches

Mean annual air temperature: 37 to 46 degrees F

Frost-free period: 70 to 160 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Hartland and similar soils: 87 percent

Minor components: 13 percent

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

Description of Hartland

Setting

Landform: Coastal plains

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Tread

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Coarse-silty glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: very fine sandy loam

H2 - 7 to 15 inches: very fine sandy loam

H3 - 15 to 28 inches: silt loam

H4 - 28 to 65 inches: very fine sandy loam

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Hydric soil rating: No

Minor Components

Scio

Percent of map unit: 5 percent

Landform: Outwash plains

Landform position (two-dimensional): Toeslope

Custom Soil Resource Report

Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Hartland, < 8 percent slopes

Percent of map unit: 2 percent
Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Buxton

Percent of map unit: 2 percent
Landform: Marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Scantic

Percent of map unit: 2 percent
Landform: Coastal plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Windsor

Percent of map unit: 1 percent
Landform: Eskers
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Hartland, > 15 percent slopes

Percent of map unit: 1 percent
Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

HfD—Hartland very fine sandy loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9k05
Elevation: 10 to 2,200 feet
Mean annual precipitation: 30 to 48 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 70 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Hartland and similar soils: 91 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hartland

Setting

Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Coarse-silty glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: very fine sandy loam
H2 - 7 to 15 inches: very fine sandy loam
H3 - 15 to 28 inches: silt loam
H4 - 28 to 65 inches: very fine sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Buxton

Percent of map unit: 3 percent
Landform: Marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Hartland, > 25 percent slopes

Percent of map unit: 2 percent
Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Scio

Percent of map unit: 2 percent
Landform: Outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Windsor

Percent of map unit: 1 percent
Landform: Eskers
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluvium
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Hartland, < 15 percent slopes

Percent of map unit: 1 percent
Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

**PdC2—Paxton-Charlton fine sandy loams, 8 to 15 percent slopes,
eroded**

Map Unit Setting

National map unit symbol: 9k0y
Elevation: 10 to 3,500 feet
Mean annual precipitation: 34 to 50 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 60 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Paxton and similar soils: 60 percent
Charlton and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Drumlins
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Coarse-loamy lodgment till derived from mica schist

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 31 inches: gravelly fine sandy loam
H3 - 31 to 65 inches: fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 18 to 40 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 18 to 26 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Description of Charlton

Setting

Landform: Drumlins

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Coarse-loamy supraglacial meltout till derived from mica schist

Typical profile

H1 - 0 to 6 inches: fine sandy loam

H2 - 6 to 20 inches: gravelly fine sandy loam

H3 - 20 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Hydric soil rating: No

Minor Components

Tunbridge

Percent of map unit: 5 percent

Landform: Moraines

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Crest

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Woodbridge

Percent of map unit: 5 percent

Landform: Drumlins

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Hollis

Percent of map unit: 2 percent

Landform: Drumlins

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Crest

Down-slope shape: Convex

Custom Soil Resource Report

Across-slope shape: Convex

Hydric soil rating: No

Paxton, > 15 percent slopes

Percent of map unit: 1 percent

Landform: Drumlins

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Ridgebury

Percent of map unit: 1 percent

Landform: Till plains

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Hydric soil rating: Yes

Paxton, < 8 percent slopes

Percent of map unit: 1 percent

Landform: Drumlins

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

RdA—Ridgebury very stony fine sandy loam

Map Unit Setting

National map unit symbol: 9k17

Elevation: 10 to 2,500 feet

Mean annual precipitation: 30 to 50 inches

Mean annual air temperature: 37 to 46 degrees F

Frost-free period: 70 to 160 days

Farmland classification: Not prime farmland

Map Unit Composition

Ridgebury and similar soils: 85 percent

Minor components: 15 percent

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

Description of Ridgebury

Setting

Landform: Till plains

Landform position (two-dimensional): Footslope

Custom Soil Resource Report

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Parent material: Coarse-loamy lodgment till derived from mica schist

Typical profile

H1 - 0 to 8 inches: fine sandy loam

H2 - 8 to 14 inches: fine sandy loam

H3 - 14 to 65 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent

Percent of area covered with surface fragments: 1.6 percent

Depth to restrictive feature: 10 to 25 inches to densic material

Natural drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)

Depth to water table: About 0 to 12 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C/D

Hydric soil rating: Yes

Minor Components

Peru

Percent of map unit: 5 percent

Landform: Till plains

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Rise

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Woodbridge

Percent of map unit: 5 percent

Landform: Till plains

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Peacham

Percent of map unit: 3 percent

Landform: Till plains

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Ridgebury, > 3% stone cover

Percent of map unit: 2 percent
Landform: Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

SkB—Scio very fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9k1d
Elevation: 10 to 2,200 feet
Mean annual precipitation: 30 to 48 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 70 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Scio and similar soils: 89 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scio

Setting

Landform: Outwash plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Very fine sand glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: very fine sandy loam
H2 - 10 to 22 inches: silt loam
H3 - 22 to 65 inches: very fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C

Hydric soil rating: No

Minor Components

Hartland

Percent of map unit: 3 percent

Landform: Coastal plains

Landform position (two-dimensional): Shoulder

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Scantic

Percent of map unit: 3 percent

Landform: Coastal plains

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Windsor

Percent of map unit: 2 percent

Landform: Outwash plains

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Riser

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Buxton

Percent of map unit: 2 percent

Landform: Till plains

Landform position (three-dimensional): Rise

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Scio, > 3% slopes

Percent of map unit: 1 percent

Landform: Outwash plains

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Talf

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: No

SkC2—Scio very fine sandy loam, 8 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: 9k1f
Elevation: 10 to 2,200 feet
Mean annual precipitation: 30 to 48 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 70 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Scio and similar soils: 89 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scio

Setting

Landform: Eskers
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Very fine sand glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: very fine sandy loam
H2 - 10 to 22 inches: silt loam
H3 - 22 to 65 inches: very fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Hartland

Percent of map unit: 3 percent
Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Head slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Windsor

Percent of map unit: 2 percent
Landform: Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Scantic

Percent of map unit: 2 percent
Landform: Coastal plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scio, > 15 percent slopes

Percent of map unit: 2 percent
Landform: Eskers
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Buxton

Percent of map unit: 2 percent
Landform: Till plains
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

WrB—Woodbridge fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9k1r

Custom Soil Resource Report

Elevation: 10 to 3,500 feet

Mean annual precipitation: 34 to 50 inches

Mean annual air temperature: 37 to 46 degrees F

Frost-free period: 60 to 160 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Woodbridge and similar soils: 85 percent

Minor components: 15 percent

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

Description of Woodbridge

Setting

Landform: Till plains

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Coarse-loamy lodgment till derived from mica schist

Typical profile

H1 - 0 to 7 inches: fine sandy loam

H2 - 7 to 22 inches: fine sandy loam

H3 - 22 to 65 inches: fine sandy loam

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: 18 to 30 inches to densic material

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)

Depth to water table: About 16 to 24 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C/D

Hydric soil rating: No

Minor Components

Hollis

Percent of map unit: 3 percent

Landform: Till plains

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Rise

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Tunbridge

Percent of map unit: 3 percent

Landform: Till plains

Custom Soil Resource Report

Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Paxton

Percent of map unit: 3 percent
Landform: Till plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Dip
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury

Percent of map unit: 2 percent
Landform: Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Charlton

Percent of map unit: 2 percent
Landform: Till plains
Landform position (three-dimensional): Dip
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Woodbridge, > 8% slopes

Percent of map unit: 2 percent
Landform: Till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Appendix C

Per Acre Phosphorus Allocations
for Selected Maine Lakes

Updated 11/1/17

Lake Name	Town in which development is located	Direct Watershed Area in Town (acres) DDA	Area not available for development (acres) ANAD	Area available for development (acres) AAD	GF	Expected developed area (acres) D	(lbP/y) F	Water Quality Category WQC	LOP	C	FC	Per acre phosphorus allocation (lb/acre/yr) P	Small Watershed Threshold (acres) SWT
Meduxnekeag Lake	Oakfield	6958	500	6458	0.15	969	70.05	mod-sens	h	0.75	52.54	0.054	242
Meetinghouse Pond	Phippsburg	69	15	54	0.25	14	0.66	mod-sens	m	1.00	0.66	0.049	3
Megunticook Lake Basin 1	Lincolnville	1176	240	936	0.25	234	17.61	mod-sens	h	0.75	13.21	0.056	59
Megunticook Lake Basin 2	Lincolnville	2513	250	2263	0.25	566	28.86	mod-sens	h	0.75	21.65	0.038	141
Megunticook Lake North Basin	Hope	874	100	774	0.25	194	10.03	mod-sens	h	0.75	7.52	0.039	48
Megunticook Lake South Basin	Camden	2807	560	2247	0.3	674	42.07	mod-sens	h	0.75	31.55	0.047	169
Megunticook Lake South Basin	Hope	1363	150	1213	0.25	303	20.44	mod-sens	h	0.75	15.33	0.051	76
Merril Pond	Lee	1465	500	965	0.25	241	14.57	mod-sens	m	1.00	14.57	0.060	60
Messalonskee Lake	Belgrade	11312	1286	10026	0.23	2274	205.7	mod-sens	h	0.75	154.31	0.068	568
Messalonskee Lake	Readfield	2915	150	2765	0.25	691	53.05	mod-sens	h	0.75	39.79	0.058	173
Messalonskee Lake	Mount Vernon	3830	300	3530	0.25	883	69.65	mod-sens	h	0.75	52.24	0.059	221
Messalonskee Lake	Sidney	6333	1500	4833	0.3	1450	115.2	mod-sens	h	0.75	86.39	0.060	362
Mid Basin, Damariscotta Lake	Nobleboro	4047	405	3642	0.3	1093	75.27	mod-sens	h	0.75	56.45	0.051	273
Mid Basin, Damariscotta Lake	Jefferson	405	40	365	0.2	73	7.49	mod-sens	h	0.75	5.62	0.077	18
Middle Branch Pond	Alfred	207	90	117	0.2	23	1.65	mod-sens	m	1.00	1.65	0.071	6
Middle Pond	Waterford	39	20	19	0.25	5	0.39	mod-sens	h	0.75	0.29	0.062	1
Middle Pond	Lovell	79	5	74	0.2	15	0.81	mod-sens	h	0.75	0.61	0.041	4
Middle Range Pond	Poland	3170	300	2870	0.25	718	43.52	mod-sens	h	0.75	32.64	0.045	179
Middle Springy Pond	Clifton	69	35	34	0.2	7	0.79	mod-sens	m	1.00	0.79	0.116	2
Mill Pond	Deer Isle	429	64	365	0.25	91	4.63	mod-sens	m	1.00	4.63	0.051	23
Mill Pond	Washington	1008	40	968	0.2	194	7.18	mod-sens	m	1.00	7.18	0.037	48
Mill Pond	Lee	1596	175	1421	0.25	355	11.86	mod-sens	m	1.00	11.86	0.033	89
Mill Pond	New Vineyard	751	75	676	0.25	169	9.67	mod-sens	m	1.00	9.67	0.057	42
Mill Privilege Lake	Carroll Plt	2614	300	2314	0.15	347	17.08	mod-sens	m	1.00	17.08	0.049	87
Mill Privilege Lake	Lakeville	513	40	473	0.15	71	3.35	mod-sens	m	1.00	3.35	0.047	18
Mill Privilege Lake	Pukakon Twp	343	20	323	0.15	48	2.24	mod-sens	m	1.00	2.24	0.046	12
Millinocket Lake	T1R8 WELS	4190	200	3990	0.25	998	53.31	good	h	1.00	53.31	0.053	249
Millinocket Lake	T1R9 WELS	3165	500	2665	0.25	666	40.28	good	h	1.00	40.28	0.060	167
Milton Pond	Lebanon	931	110	821	0.25	205	9.06	mod-sens	m	1.00	9.06	0.044	51
Minnehonk Lake	Mount Vernon	1116	200	916	0.35	321	20.13	good	h	1.00	20.13	0.063	80
Mirror Lake	Camden	182	30	152	0.25	38	2.29	good	h	1.00	2.29	0.060	10
Mirror Lake	Rockport	753	175	578	0.2	116	9.48	mod-sens	h	0.75	7.11	0.062	29

Worksheet 1 - PPB calculations			
Project Name: Solar Fields - Parker Station			
Lake Watershed: Messalonskee Lake			
Town: Belgrade			
Standard Calculations			
Watershed per acre phosphorus budget (Appendix C)	PAPB	0.068	lbs P/acre/year
Total acreage of development parcel:	TA	24.9	acres
NWI wetland acreage:	WA	0.69	acres
Steep slope acreage:	SA	0	acres
Project acreage: $A = TA - (WA + SA)$	A	24.21	acres
Project Phosphorus Budget: $PPB = P \times A$	PPB	1.64628	lbs P/year
Small Watershed Adjustment			
If Project Acreage (A) is greater than the threshold acreage for the small watershed threshold (SWT, from pertinent lake and town info in the table in Appendix C), calculate an alternative PPB using the analysis below and use this value if it is less than the the Standard Calculation PPB.			
Small Watershed Threshold (Appendix C):	SWT	568	acres
Project acreage:	A	24.9	acres
Allowable increase in town's share of annual phosphorus load to lake (Appendix C):	FC	154.31	lbs P/year
Area available for development (Appendix C):	AAD	10026	acres
Ratio of A to AAD ($R = A/AAD$)	R	N/A	
Project Phosphorus Budget			
If $R < 0.5$, $PPB = [(FC \times R)/2] + [FC/4]$	PPB	N/A	lbs P/year
If $R > 0.5$, $PPB = FC \times R$	PPB	N/A	lbs P/year

Worksheet 2

Pre-PPE and Post-PPE Calculations

Calculate phosphorus export from development for before and after treatment

Use as many sheets as needed for each development type (commercial, roads, residential lots, etc.)

Project name: Solar Fields - Parker Station

Development type: Commercial

Sheet # 1 of 1

Land Surface Type or Lot #(s) with description	Acres or # of lots	Export Coefficient from Table 3.1 Table 3.2	Pre- treatment Algal Av. P Export (lbs P/year)	Treatment Factor for BMP(s) from Chapter 6	Post- treatment Algal Av. P Export (lbs P/year)	Description of BMPs
Power Station	0.00792	0.5	0.00396006	1	0.00396006	No BMP
Crushed Rock	0.03818	0.3	0.01145317	1	0.01145317	No BMP
Gravel Road (Treated)	0.12121	1.75	0.21212121	0.4	0.08484848	Meadow Buffer Sta 0+50 to 3+80
Gravel Road (Untreated)	0.27748	1.75	0.48558884	1	0.48558884	No BMP
			0	1	0	
			0	1	0	
			0	1	0	
			0	1	0	
			0	1	0	
			0	1	0	
			0	1	0	
		Total Pre-PPE (lbs P/year)	0.71312328	Total PostPPE (lbs P/year)	0.58585055	

WORKSHEET 4 - PROJECT PHOSPHORUS EXPORT SUMMARY

Summarizing the project's algal available phosphorus export (PPE)

Project Name: Solar Fields - Parker Station

Project Phosphorus Budget - Worksheet 1	PPB	1.65	lbs P/year
Total Pre-Treatment Phosphorus Export - Worksheet 2	Pre-PPE	0.71	lbs P/year
Total Post-Treatment Phosphorus Export - Worksheet 2	Post-PPE	0.59	lbs P/year
Total Phosphorus Mitigation Credit - Worksheet 3	TMC	0.00	lbs P/year
Project Phosphorus Export (Post-PPE - TMC)	PPE	0.59	lbs P/year

Is the Project Phosphorus Export \leq the Project Phosphorus Budget? ($PPE \leq PPB$)

<p>If YES, PPE is less than or equal to PPB and the project meets its phosphorus budget.</p> <p>If NO, PPE is greater than PPB, more reduction in phosphorus export is required or the payment of a compensation fee may be an option</p>	YES
The amount of phosphorus that needs further treatment or compensation	lbs P/year

Has Project Phosphorus Export been sufficiently reduced?

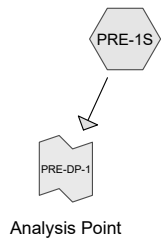
Is $(Pre-PPE - Post-PPE)/Pre-PPE$ greater than 0.60?

<p>If YES, in some watersheds the compensation fee is an available option.</p> <p>If NO, more treatment must be provided. PPE must be further reduced.</p>	
The post-treatment phosphorus export must be less than 40% of the pre-treatment export ($Post-PPE < 0.4 * Pre-PPE$)	%

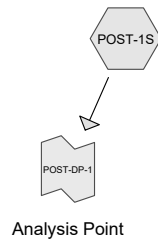
If the project is located in a watershed that is eligible for a compensation fee (or is a residential subdivision with buffers), a compensation fee may be appropriate as follows:

If Project Export has been reduced by greater than 60% and less than 75%, \$25,000 per pound minus \$833 per 1% Percent Export	
If Project Export has been reduced by greater than 75%, \$12,500 per pound minus \$500 per 1% Project Export	

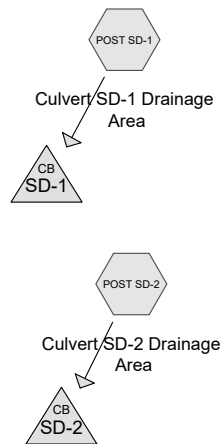
PRE-DEVELOPMENT



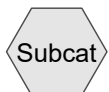
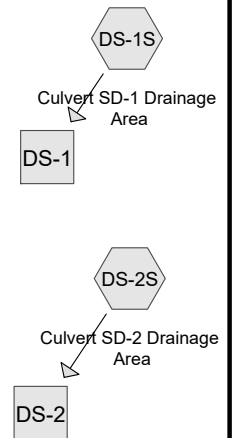
POST-DEVELOPMENT



CULVERT SIZING



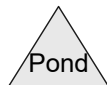
DITCH STABILIZATION



Subcat



Reach



Pond



Link

Routing Diagram for Solar Fields Belgrade - Stormwater Model

Prepared by TRC, Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 2-YR Rainfall=2.80"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 2

Summary for Subcatchment DS-1S: Culvert SD-1 Drainage Area

Runoff = 0.10 cfs @ 12.25 hrs, Volume= 0.011 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.80"

Area (ac)	CN	Description
0.129	78	Meadow, non-grazed, HSG D
0.129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment DS-2S: Culvert SD-2 Drainage Area

Runoff = 3.15 cfs @ 12.57 hrs, Volume= 0.476 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.80"

Area (ac)	CN	Description
1.530	71	Meadow, non-grazed, HSG C
2.297	78	Meadow, non-grazed, HSG D
1.956	70	Woods, Good, HSG C
0.261	77	Woods, Good, HSG D
0.087	79	Woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
0.185	96	Gravel surface, HSG C
6.868	75	Weighted Average
6.779		98.70% Pervious Area
0.089		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST SD-1: Culvert SD-1 Drainage Area

Runoff = 0.10 cfs @ 12.25 hrs, Volume= 0.011 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.80"

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 2-YR Rainfall=2.80"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 3

Area (ac)	CN	Description
0.129	78	Meadow, non-grazed, HSG D
0.129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST SD-2: Culvert SD-2 Drainage Area

Runoff = 3.15 cfs @ 12.57 hrs, Volume= 0.476 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.80"

Area (ac)	CN	Description
1.530	71	Meadow, non-grazed, HSG C
2.297	78	Meadow, non-grazed, HSG D
1.956	70	Woods, Good, HSG C
0.261	77	Woods, Good, HSG D
0.087	79	Woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
0.185	96	Gravel surface, HSG C
6.868	75	Weighted Average
6.779		98.70% Pervious Area
0.089		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST-1S:

Runoff = 9.37 cfs @ 12.84 hrs, Volume= 1.834 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.80"

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 2-YR Rainfall=2.80"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 4

Area (ac)	CN	Description
0.008	98	Unconnected pavement, HSG C
0.437	96	Gravel surface, HSG C
0.425	58	Meadow, non-grazed, HSG B
14.098	71	Meadow, non-grazed, HSG C
6.665	78	Meadow, non-grazed, HSG D
1.935	55	Woods, Good, HSG B
5.386	70	Woods, Good, HSG C
1.609	77	Woods, Good, HSG D
* 0.693	79	Wetland, woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
31.808	72	Weighted Average
31.711		99.70% Pervious Area
0.097		0.30% Impervious Area
0.008		8.25% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
54.9					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment PRE-1S:

Runoff = 9.30 cfs @ 12.85 hrs, Volume= 1.834 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.80"

Area (ac)	CN	Description
0.425	58	Meadow, non-grazed, HSG B
14.426	71	Meadow, non-grazed, HSG C
6.783	78	Meadow, non-grazed, HSG D
1.935	55	Woods, Good, HSG B
5.386	70	Woods, Good, HSG C
1.609	77	Woods, Good, HSG D
* 0.693	79	Wetland, woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
31.809	72	Weighted Average
31.720		99.72% Pervious Area
0.089		0.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
55.6					Direct Entry, See Tc Calculation Sheet

Solar Fields Belgrade - Stormwater Model

Prepared by TRC

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Type III 24-hr 2-YR Rainfall=2.80"

Printed 2020-05-04

Page 5

Summary for Reach DS-1:

Inflow Area = 0.129 ac, 0.00% Impervious, Inflow Depth = 0.99" for 2-YR event
Inflow = 0.10 cfs @ 12.25 hrs, Volume= 0.011 af
Outflow = 0.10 cfs @ 12.25 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.77 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.33 fps, Avg. Travel Time= 1.3 min

Peak Storage= 3 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 1.50' Flow Area= 6.4 sf, Capacity= 28.57 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.5 '/' Top Width= 6.50'
Length= 25.0' Slope= 0.0100 '/'
Inlet Invert= 319.55', Outlet Invert= 319.30'



Summary for Reach DS-2:

Inflow Area = 6.868 ac, 1.30% Impervious, Inflow Depth = 0.83" for 2-YR event
Inflow = 3.15 cfs @ 12.57 hrs, Volume= 0.476 af
Outflow = 3.15 cfs @ 12.59 hrs, Volume= 0.476 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.17 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 3.0 min

Peak Storage= 218 cf @ 12.59 hrs
Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 1.50' Flow Area= 12.4 sf, Capacity= 79.26 cfs

6.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.5 '/' Top Width= 10.50'
Length= 150.0' Slope= 0.0150 '/'
Inlet Invert= 304.50', Outlet Invert= 302.25'



Solar Fields Belgrade - Stormwater Model

Prepared by TRC

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Type III 24-hr 2-YR Rainfall=2.80"

Printed 2020-05-04

Page 6

Summary for Pond SD-1:

Inflow Area = 0.129 ac, 0.00% Impervious, Inflow Depth = 0.99" for 2-YR event
Inflow = 0.10 cfs @ 12.25 hrs, Volume= 0.011 af
Outflow = 0.10 cfs @ 12.25 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
Primary = 0.10 cfs @ 12.25 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Peak Elev= 319.91' @ 12.25 hrs

Flood Elev= 322.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	319.75'	15.0" Round Culvert L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 319.75' / 319.55' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.10 cfs @ 12.25 hrs HW=319.91' (Free Discharge)

↑1=Culvert (Barrel Controls 0.10 cfs @ 1.78 fps)

Summary for Pond SD-2:

Inflow Area = 6.868 ac, 1.30% Impervious, Inflow Depth = 0.83" for 2-YR event
Inflow = 3.15 cfs @ 12.57 hrs, Volume= 0.476 af
Outflow = 3.15 cfs @ 12.57 hrs, Volume= 0.476 af, Atten= 0%, Lag= 0.0 min
Primary = 3.15 cfs @ 12.57 hrs, Volume= 0.476 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Peak Elev= 305.80' @ 12.57 hrs

Flood Elev= 308.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	305.00'	24.0" Round Culvert L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 305.00' / 304.50' S= 0.0250 ' S= 0.0250 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=3.15 cfs @ 12.57 hrs HW=305.80' (Free Discharge)

↑1=Culvert (Inlet Controls 3.15 cfs @ 2.69 fps)

Summary for Link POST-DP-1: Analysis Point

Inflow Area = 31.808 ac, 0.30% Impervious, Inflow Depth = 0.69" for 2-YR event
Inflow = 9.37 cfs @ 12.84 hrs, Volume= 1.834 af
Primary = 9.37 cfs @ 12.84 hrs, Volume= 1.834 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 2-YR Rainfall=2.80"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 7

Summary for Link PRE-DP-1: Analysis Point

Inflow Area = 31.809 ac, 0.28% Impervious, Inflow Depth = 0.69" for 2-YR event

Inflow = 9.30 cfs @ 12.85 hrs, Volume= 1.834 af

Primary = 9.30 cfs @ 12.85 hrs, Volume= 1.834 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 10-YR Rainfall=4.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 8

Summary for Subcatchment DS-1S: Culvert SD-1 Drainage Area

Runoff = 0.22 cfs @ 12.24 hrs, Volume= 0.022 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.20"

Area (ac)	CN	Description
0.129	78	Meadow, non-grazed, HSG D
0.129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment DS-2S: Culvert SD-2 Drainage Area

Runoff = 7.32 cfs @ 12.54 hrs, Volume= 1.041 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.20"

Area (ac)	CN	Description
1.530	71	Meadow, non-grazed, HSG C
2.297	78	Meadow, non-grazed, HSG D
1.956	70	Woods, Good, HSG C
0.261	77	Woods, Good, HSG D
0.087	79	Woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
0.185	96	Gravel surface, HSG C
6.868	75	Weighted Average
6.779		98.70% Pervious Area
0.089		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST SD-1: Culvert SD-1 Drainage Area

Runoff = 0.22 cfs @ 12.24 hrs, Volume= 0.022 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.20"

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 10-YR Rainfall=4.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 9

Area (ac)	CN	Description
0.129	78	Meadow, non-grazed, HSG D
0.129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST SD-2: Culvert SD-2 Drainage Area

Runoff = 7.32 cfs @ 12.54 hrs, Volume= 1.041 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.20"

Area (ac)	CN	Description
1.530	71	Meadow, non-grazed, HSG C
2.297	78	Meadow, non-grazed, HSG D
1.956	70	Woods, Good, HSG C
0.261	77	Woods, Good, HSG D
0.087	79	Woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
0.185	96	Gravel surface, HSG C
6.868	75	Weighted Average
6.779		98.70% Pervious Area
0.089		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST-1S:

Runoff = 23.95 cfs @ 12.78 hrs, Volume= 4.246 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.20"

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 10-YR Rainfall=4.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 10

Area (ac)	CN	Description
0.008	98	Unconnected pavement, HSG C
0.437	96	Gravel surface, HSG C
0.425	58	Meadow, non-grazed, HSG B
14.098	71	Meadow, non-grazed, HSG C
6.665	78	Meadow, non-grazed, HSG D
1.935	55	Woods, Good, HSG B
5.386	70	Woods, Good, HSG C
1.609	77	Woods, Good, HSG D
* 0.693	79	Wetland, woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
31.808	72	Weighted Average
31.711		99.70% Pervious Area
0.097		0.30% Impervious Area
0.008		8.25% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
54.9					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment PRE-1S:

Runoff = 23.80 cfs @ 12.80 hrs, Volume= 4.246 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.20"

Area (ac)	CN	Description
0.425	58	Meadow, non-grazed, HSG B
14.426	71	Meadow, non-grazed, HSG C
6.783	78	Meadow, non-grazed, HSG D
1.935	55	Woods, Good, HSG B
5.386	70	Woods, Good, HSG C
1.609	77	Woods, Good, HSG D
* 0.693	79	Wetland, woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
31.809	72	Weighted Average
31.720		99.72% Pervious Area
0.089		0.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
55.6					Direct Entry, See Tc Calculation Sheet

Solar Fields Belgrade - Stormwater Model

Prepared by TRC

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Type III 24-hr 10-YR Rainfall=4.20"

Printed 2020-05-04

Page 11

Summary for Reach DS-1:

Inflow Area = 0.129 ac, 0.00% Impervious, Inflow Depth = 2.05" for 10-YR event
Inflow = 0.22 cfs @ 12.24 hrs, Volume= 0.022 af
Outflow = 0.22 cfs @ 12.24 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.02 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.36 fps, Avg. Travel Time= 1.2 min

Peak Storage= 5 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 1.50' Flow Area= 6.4 sf, Capacity= 28.57 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.5 '/' Top Width= 6.50'
Length= 25.0' Slope= 0.0100 '/'
Inlet Invert= 319.55', Outlet Invert= 319.30'



Summary for Reach DS-2:

Inflow Area = 6.868 ac, 1.30% Impervious, Inflow Depth = 1.82" for 10-YR event
Inflow = 7.32 cfs @ 12.54 hrs, Volume= 1.041 af
Outflow = 7.32 cfs @ 12.55 hrs, Volume= 1.041 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.94 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.03 fps, Avg. Travel Time= 2.4 min

Peak Storage= 373 cf @ 12.55 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 1.50' Flow Area= 12.4 sf, Capacity= 79.26 cfs

6.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.5 '/' Top Width= 10.50'
Length= 150.0' Slope= 0.0150 '/'
Inlet Invert= 304.50', Outlet Invert= 302.25'



Solar Fields Belgrade - Stormwater Model

Prepared by TRC

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Type III 24-hr 10-YR Rainfall=4.20"

Printed 2020-05-04

Page 12

Summary for Pond SD-1:

Inflow Area = 0.129 ac, 0.00% Impervious, Inflow Depth = 2.05" for 10-YR event
Inflow = 0.22 cfs @ 12.24 hrs, Volume= 0.022 af
Outflow = 0.22 cfs @ 12.24 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min
Primary = 0.22 cfs @ 12.24 hrs, Volume= 0.022 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Peak Elev= 319.98' @ 12.24 hrs

Flood Elev= 322.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	319.75'	15.0" Round Culvert L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 319.75' / 319.55' S= 0.0100 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.22 cfs @ 12.24 hrs HW=319.98' (Free Discharge)

↑**1=Culvert** (Barrel Controls 0.22 cfs @ 2.14 fps)

Summary for Pond SD-2:

Inflow Area = 6.868 ac, 1.30% Impervious, Inflow Depth = 1.82" for 10-YR event
Inflow = 7.32 cfs @ 12.54 hrs, Volume= 1.041 af
Outflow = 7.32 cfs @ 12.54 hrs, Volume= 1.041 af, Atten= 0%, Lag= 0.0 min
Primary = 7.32 cfs @ 12.54 hrs, Volume= 1.041 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Peak Elev= 306.29' @ 12.54 hrs

Flood Elev= 308.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	305.00'	24.0" Round Culvert L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 305.00' / 304.50' S= 0.0250 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=7.31 cfs @ 12.54 hrs HW=306.29' (Free Discharge)

↑**1=Culvert** (Inlet Controls 7.31 cfs @ 3.41 fps)

Summary for Link POST-DP-1: Analysis Point

Inflow Area = 31.808 ac, 0.30% Impervious, Inflow Depth = 1.60" for 10-YR event
Inflow = 23.95 cfs @ 12.78 hrs, Volume= 4.246 af
Primary = 23.95 cfs @ 12.78 hrs, Volume= 4.246 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 10-YR Rainfall=4.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 13

Summary for Link PRE-DP-1: Analysis Point

Inflow Area = 31.809 ac, 0.28% Impervious, Inflow Depth = 1.60" for 10-YR event
Inflow = 23.80 cfs @ 12.80 hrs, Volume= 4.246 af
Primary = 23.80 cfs @ 12.80 hrs, Volume= 4.246 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 25-YR Rainfall=5.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 14

Summary for Subcatchment DS-1S: Culvert SD-1 Drainage Area

Runoff = 0.32 cfs @ 12.23 hrs, Volume= 0.031 af, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.20"

Area (ac)	CN	Description
0.129	78	Meadow, non-grazed, HSG D
0.129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment DS-2S: Culvert SD-2 Drainage Area

Runoff = 10.63 cfs @ 12.53 hrs, Volume= 1.495 af, Depth= 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.20"

Area (ac)	CN	Description
1.530	71	Meadow, non-grazed, HSG C
2.297	78	Meadow, non-grazed, HSG D
1.956	70	Woods, Good, HSG C
0.261	77	Woods, Good, HSG D
0.087	79	Woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
0.185	96	Gravel surface, HSG C
6.868	75	Weighted Average
6.779		98.70% Pervious Area
0.089		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST SD-1: Culvert SD-1 Drainage Area

Runoff = 0.32 cfs @ 12.23 hrs, Volume= 0.031 af, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.20"

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 25-YR Rainfall=5.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 15

Area (ac)	CN	Description
0.129	78	Meadow, non-grazed, HSG D
0.129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST SD-2: Culvert SD-2 Drainage Area

Runoff = 10.63 cfs @ 12.53 hrs, Volume= 1.495 af, Depth= 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.20"

Area (ac)	CN	Description
1.530	71	Meadow, non-grazed, HSG C
2.297	78	Meadow, non-grazed, HSG D
1.956	70	Woods, Good, HSG C
0.261	77	Woods, Good, HSG D
0.087	79	Woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
0.185	96	Gravel surface, HSG C
6.868	75	Weighted Average
6.779		98.70% Pervious Area
0.089		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST-1S:

Runoff = 35.98 cfs @ 12.76 hrs, Volume= 6.237 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.20"

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 25-YR Rainfall=5.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 16

Area (ac)	CN	Description
0.008	98	Unconnected pavement, HSG C
0.437	96	Gravel surface, HSG C
0.425	58	Meadow, non-grazed, HSG B
14.098	71	Meadow, non-grazed, HSG C
6.665	78	Meadow, non-grazed, HSG D
1.935	55	Woods, Good, HSG B
5.386	70	Woods, Good, HSG C
1.609	77	Woods, Good, HSG D
* 0.693	79	Wetland, woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
31.808	72	Weighted Average
31.711		99.70% Pervious Area
0.097		0.30% Impervious Area
0.008		8.25% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
54.9					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment PRE-1S:

Runoff = 35.68 cfs @ 12.78 hrs, Volume= 6.237 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.20"

Area (ac)	CN	Description
0.425	58	Meadow, non-grazed, HSG B
14.426	71	Meadow, non-grazed, HSG C
6.783	78	Meadow, non-grazed, HSG D
1.935	55	Woods, Good, HSG B
5.386	70	Woods, Good, HSG C
1.609	77	Woods, Good, HSG D
* 0.693	79	Wetland, woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
31.809	72	Weighted Average
31.720		99.72% Pervious Area
0.089		0.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
55.6					Direct Entry, See Tc Calculation Sheet

Solar Fields Belgrade - Stormwater Model

Prepared by TRC

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Type III 24-hr 25-YR Rainfall=5.20"

Printed 2020-05-04

Page 17

Summary for Reach DS-1:

Inflow Area = 0.129 ac, 0.00% Impervious, Inflow Depth = 2.88" for 25-YR event
Inflow = 0.32 cfs @ 12.23 hrs, Volume= 0.031 af
Outflow = 0.32 cfs @ 12.24 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.15 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.38 fps, Avg. Travel Time= 1.1 min

Peak Storage= 7 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 1.50' Flow Area= 6.4 sf, Capacity= 28.57 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.5 '/' Top Width= 6.50'
Length= 25.0' Slope= 0.0100 '/'
Inlet Invert= 319.55', Outlet Invert= 319.30'



Summary for Reach DS-2:

Inflow Area = 6.868 ac, 1.30% Impervious, Inflow Depth = 2.61" for 25-YR event
Inflow = 10.63 cfs @ 12.53 hrs, Volume= 1.495 af
Outflow = 10.63 cfs @ 12.54 hrs, Volume= 1.495 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.36 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.15 fps, Avg. Travel Time= 2.2 min

Peak Storage= 475 cf @ 12.54 hrs
Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 1.50' Flow Area= 12.4 sf, Capacity= 79.26 cfs

6.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.5 '/' Top Width= 10.50'
Length= 150.0' Slope= 0.0150 '/'
Inlet Invert= 304.50', Outlet Invert= 302.25'



Solar Fields Belgrade - Stormwater Model

Type III 24-hr 25-YR Rainfall=5.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 18

Summary for Pond SD-1:

Inflow Area = 0.129 ac, 0.00% Impervious, Inflow Depth = 2.88" for 25-YR event
Inflow = 0.32 cfs @ 12.23 hrs, Volume= 0.031 af
Outflow = 0.32 cfs @ 12.23 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min
Primary = 0.32 cfs @ 12.23 hrs, Volume= 0.031 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Peak Elev= 320.03' @ 12.23 hrs

Flood Elev= 322.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	319.75'	15.0" Round Culvert L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 319.75' / 319.55' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.31 cfs @ 12.23 hrs HW=320.03' (Free Discharge)

↑**1=Culvert** (Barrel Controls 0.31 cfs @ 2.32 fps)

Summary for Pond SD-2:

Inflow Area = 6.868 ac, 1.30% Impervious, Inflow Depth = 2.61" for 25-YR event
Inflow = 10.63 cfs @ 12.53 hrs, Volume= 1.495 af
Outflow = 10.63 cfs @ 12.53 hrs, Volume= 1.495 af, Atten= 0%, Lag= 0.0 min
Primary = 10.63 cfs @ 12.53 hrs, Volume= 1.495 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Peak Elev= 306.64' @ 12.53 hrs

Flood Elev= 308.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	305.00'	24.0" Round Culvert L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 305.00' / 304.50' S= 0.0250 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=10.61 cfs @ 12.53 hrs HW=306.64' (Free Discharge)

↑**1=Culvert** (Inlet Controls 10.61 cfs @ 3.85 fps)

Summary for Link POST-DP-1: Analysis Point

Inflow Area = 31.808 ac, 0.30% Impervious, Inflow Depth = 2.35" for 25-YR event
Inflow = 35.98 cfs @ 12.76 hrs, Volume= 6.237 af
Primary = 35.98 cfs @ 12.76 hrs, Volume= 6.237 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Summary for Link PRE-DP-1: Analysis Point

Inflow Area = 31.809 ac, 0.28% Impervious, Inflow Depth = 2.35" for 25-YR event

Inflow = 35.68 cfs @ 12.78 hrs, Volume= 6.237 af

Primary = 35.68 cfs @ 12.78 hrs, Volume= 6.237 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 100-YR Rainfall=7.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 20

Summary for Subcatchment DS-1S: Culvert SD-1 Drainage Area

Runoff = 0.51 cfs @ 12.23 hrs, Volume= 0.050 af, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=7.20"

Area (ac)	CN	Description
0.129	78	Meadow, non-grazed, HSG D
0.129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment DS-2S: Culvert SD-2 Drainage Area

Runoff = 17.68 cfs @ 12.52 hrs, Volume= 2.476 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=7.20"

Area (ac)	CN	Description
1.530	71	Meadow, non-grazed, HSG C
2.297	78	Meadow, non-grazed, HSG D
1.956	70	Woods, Good, HSG C
0.261	77	Woods, Good, HSG D
0.087	79	Woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
0.185	96	Gravel surface, HSG C
6.868	75	Weighted Average
6.779		98.70% Pervious Area
0.089		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST SD-1: Culvert SD-1 Drainage Area

Runoff = 0.51 cfs @ 12.23 hrs, Volume= 0.050 af, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=7.20"

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 100-YR Rainfall=7.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 21

Area (ac)	CN	Description
0.129	78	Meadow, non-grazed, HSG D
0.129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST SD-2: Culvert SD-2 Drainage Area

Runoff = 17.68 cfs @ 12.52 hrs, Volume= 2.476 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=7.20"

Area (ac)	CN	Description
1.530	71	Meadow, non-grazed, HSG C
2.297	78	Meadow, non-grazed, HSG D
1.956	70	Woods, Good, HSG C
0.261	77	Woods, Good, HSG D
0.087	79	Woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
0.185	96	Gravel surface, HSG C
6.868	75	Weighted Average
6.779		98.70% Pervious Area
0.089		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST-1S:

Runoff = 61.91 cfs @ 12.75 hrs, Volume= 10.603 af, Depth= 4.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=7.20"

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 100-YR Rainfall=7.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 22

Area (ac)	CN	Description
0.008	98	Unconnected pavement, HSG C
0.437	96	Gravel surface, HSG C
0.425	58	Meadow, non-grazed, HSG B
14.098	71	Meadow, non-grazed, HSG C
6.665	78	Meadow, non-grazed, HSG D
1.935	55	Woods, Good, HSG B
5.386	70	Woods, Good, HSG C
1.609	77	Woods, Good, HSG D
* 0.693	79	Wetland, woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
31.808	72	Weighted Average
31.711		99.70% Pervious Area
0.097		0.30% Impervious Area
0.008		8.25% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
54.9					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment PRE-1S:

Runoff = 61.32 cfs @ 12.77 hrs, Volume= 10.603 af, Depth= 4.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=7.20"

Area (ac)	CN	Description
0.425	58	Meadow, non-grazed, HSG B
14.426	71	Meadow, non-grazed, HSG C
6.783	78	Meadow, non-grazed, HSG D
1.935	55	Woods, Good, HSG B
5.386	70	Woods, Good, HSG C
1.609	77	Woods, Good, HSG D
* 0.693	79	Wetland, woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
31.809	72	Weighted Average
31.720		99.72% Pervious Area
0.089		0.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
55.6					Direct Entry, See Tc Calculation Sheet

Solar Fields Belgrade - Stormwater Model

Prepared by TRC

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Type III 24-hr 100-YR Rainfall=7.20"

Printed 2020-05-04

Page 23

Summary for Reach DS-1:

Inflow Area = 0.129 ac, 0.00% Impervious, Inflow Depth = 4.66" for 100-YR event
Inflow = 0.51 cfs @ 12.23 hrs, Volume= 0.050 af
Outflow = 0.51 cfs @ 12.23 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.36 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.43 fps, Avg. Travel Time= 1.0 min

Peak Storage= 9 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 1.50' Flow Area= 6.4 sf, Capacity= 28.57 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.5 '/' Top Width= 6.50'
Length= 25.0' Slope= 0.0100 '/'
Inlet Invert= 319.55', Outlet Invert= 319.30'



Summary for Reach DS-2:

Inflow Area = 6.868 ac, 1.30% Impervious, Inflow Depth = 4.33" for 100-YR event
Inflow = 17.68 cfs @ 12.52 hrs, Volume= 2.476 af
Outflow = 17.66 cfs @ 12.53 hrs, Volume= 2.476 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.99 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 1.9 min

Peak Storage= 664 cf @ 12.53 hrs
Average Depth at Peak Storage= 0.64'
Bank-Full Depth= 1.50' Flow Area= 12.4 sf, Capacity= 79.26 cfs

6.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.5 '/' Top Width= 10.50'
Length= 150.0' Slope= 0.0150 '/'
Inlet Invert= 304.50', Outlet Invert= 302.25'



Solar Fields Belgrade - Stormwater Model

Type III 24-hr 100-YR Rainfall=7.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 24

Summary for Pond SD-1:

Inflow Area = 0.129 ac, 0.00% Impervious, Inflow Depth = 4.66" for 100-YR event
Inflow = 0.51 cfs @ 12.23 hrs, Volume= 0.050 af
Outflow = 0.51 cfs @ 12.23 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.0 min
Primary = 0.51 cfs @ 12.23 hrs, Volume= 0.050 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Peak Elev= 320.11' @ 12.23 hrs

Flood Elev= 322.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	319.75'	15.0" Round Culvert L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 319.75' / 319.55' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.50 cfs @ 12.23 hrs HW=320.11' (Free Discharge)

↑**1=Culvert** (Barrel Controls 0.50 cfs @ 2.57 fps)

Summary for Pond SD-2:

Inflow Area = 6.868 ac, 1.30% Impervious, Inflow Depth = 4.33" for 100-YR event
Inflow = 17.68 cfs @ 12.52 hrs, Volume= 2.476 af
Outflow = 17.68 cfs @ 12.52 hrs, Volume= 2.476 af, Atten= 0%, Lag= 0.0 min
Primary = 17.68 cfs @ 12.52 hrs, Volume= 2.476 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Peak Elev= 307.75' @ 12.52 hrs

Flood Elev= 308.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	305.00'	24.0" Round Culvert L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 305.00' / 304.50' S= 0.0250 ' S= 0.0250 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=17.62 cfs @ 12.52 hrs HW=307.74' (Free Discharge)

↑**1=Culvert** (Inlet Controls 17.62 cfs @ 5.61 fps)

Summary for Link POST-DP-1: Analysis Point

Inflow Area = 31.808 ac, 0.30% Impervious, Inflow Depth = 4.00" for 100-YR event
Inflow = 61.91 cfs @ 12.75 hrs, Volume= 10.603 af
Primary = 61.91 cfs @ 12.75 hrs, Volume= 10.603 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Summary for Link PRE-DP-1: Analysis Point

Inflow Area = 31.809 ac, 0.28% Impervious, Inflow Depth = 4.00" for 100-YR event
Inflow = 61.32 cfs @ 12.77 hrs, Volume= 10.603 af
Primary = 61.32 cfs @ 12.77 hrs, Volume= 10.603 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs



Solar Fields Belgrade 2MW Solar Project *Time of Concentration Summary*

PROJECT NO.: 389694
 CALCULATED BY: A.DAVIDSON
 CHECKED BY: T.DANIELS
 DATE: 2020/04/27

Time of Concentration Equations:

1. Where $T_t := \frac{0.007 \cdot (N \cdot L)^{0.8}}{P_2^{0.5} \cdot S^{0.4}}$ from SCS TR-55 For Sheet Flow (300 feet or less)
2. Where $v := 20.3282 \cdot \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Shallow Concentrated Flow (Paved surfaces)
3. Where $T_t := \frac{L}{3600 \cdot V}$ from the SCS Upland Method *Channel Flow Chart* Travel time equation
4. Where $v := 16.1345 \cdot \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Shallow Concentrated Flow (Unpaved surfaces)
5. Where: $v = 2.5 \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Shallow Concentrated Flow (Meadows)
6. Where: $v = 5 \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Shallow Concentrated Flow (Woodland)
7. Where $v := 12 \cdot \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Channel Flow - Waterways and Swamps, No Channels
8. Where $v := 15 \cdot \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Channel Flow - Grassed Waterways and Roadside Ditches
9. Where $v := 21 \cdot \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Channel Flow - Small Tributary & Swamp w/Channels
10. Where $v := 35 \cdot \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Channel Flow - Large Tributary
11. Where $v := 60 \cdot \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Channel Flow - Main River
12. Where $v := \frac{1.49 \cdot R^{0.667} \cdot \sqrt{S}}{N}$ For Channel Flow - Culvert Flow
13. Where $P_2 = 2\text{-Year, 24 Hour Rainfall (in)}$ (Kennebec County, ME: $P_2 = 2.8$ inches)

Manning's Roughness Coefficients Table

Surface Description	n - value
Smooth surfaces	0.011
Crush Stone/Substation Yards	0.025
Fallow	0.050
Cultivated: Residue<=20%	0.060
Cultivated: Residue>=20%	0.170
Grass: Short	0.150
Grass: Dense	0.240
Grass: Bermuda	0.410
Range	0.130
Woods: Light underbrush	0.400
Woods: Dense underbrush	0.800

File:	Appendix B - Time of Concentration						Calculated By:	ARD	
PROJECT:	Solar Fields Belgrade 2MW Solar Project						Checked By:	TND	
TRc Proj. No.:	389694						Date:	2020-04-27	
Subcatchment:	Pre Dev 1S						Revised:		
Time of Concentration Determination Worksheet, SCS Methods									
	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Seg 6	Seg 7	Seg 8	Seg 9
SHEET FLOW									
Manning's No.	0.240								
Length, ft	100								
P2, in	2.8								
Slope, ft/ft	0.020								
T _t ¹ , hr	0.254								0.2543
SHALLOW CONCENTRATED FLOW									
Paved									
Length, ft									
Slope, ft/ft									
Velocity ² , ft/sec									
T _t ³ , hr									0.0000
Unpaved									
Length, ft									
Slope, ft/ft									
Velocity ² , ft/sec									
T _t ³ , hr									0.0000
Meadows									
Length, ft		518							
Slope, ft/ft		0.029							
Velocity ⁴ , ft/sec		0.4254							
T _t ³ , hr		0.338							0.3382
Woodland									
Length, ft									
Slope, ft/ft									
Velocity ⁵ , ft/sec									
T _t ³ , hr									0.0000
CHANNEL FLOW									
Waterways & Swamps, No Channels									
Length, ft			219		844	193			
Slope, ft/ft			0.009		0.017	0.073			
Velocity ⁶ , ft/sec			1.147		1.546	3.232			
T _t ³ , hr			0.053		0.152	0.017			0.2213
Grassed Waterways/Roadside Ditches									
Length, ft									
Slope, ft/ft									
Velocity ⁷ , ft/sec									
T _t , hr									0.0000
Small Tributary & Swamp w/Channels									
Length, ft						944			
Slope, ft/ft						0.013			
Velocity ⁸ , ft/sec						2.368			
T _t , hr						0.111			0.1108
Large Tributary									
Length, ft									
Slope, ft/ft									
Velocity ⁹ , ft/sec									
T _t , hr									0.0000
Culvert									
Diameter, ft				1.5					
Area, ft ²				1.76625					
Wetted Perimeter, ft				4.71					
Hydraulic Radius, R, ft				0.375					
Slope, ft/ft				0.010					
Manning's No.				0.024					
Velocity ¹¹ , ft/sec				3.22740808					
Length, L, ft				20					
T _t , hr				0.00172					0.0017
									HR 0.926
									Min 55.58

File:	Appendix B - Time of Concentration						Calculated By:	ARD		
PROJECT:	Solar Fields Belgrade 2MW Solar Project						Checked By:	TND		
TRc Proj. No.:	389694						Date:	2020-05-04		
Subcatchment:	Post Dev 1S						Revised:			
Time of Concentration Determination Worksheet, SCS Methods										
	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Seg 6	Seg 7	Seg 8	Seg 9	
SHEET FLOW										
Manning's No.	0.240									
Length, ft	100									
P2, in	2.8									
Slope, ft/ft	0.020									
T _t ¹ , hr	0.254									0.2543
SHALLOW CONCENTRATED FLOW										
Paved										
Length, ft			19							
Slope, ft/ft			0.026							
Velocity ² , ft/sec			3.2977							
T _t ³ , hr			0.002							0.0016
Unpaved										
Length, ft										
Slope, ft/ft										
Velocity ² , ft/sec										
T _t ³ , hr										0.0000
Meadows										
Length, ft		257		242						
Slope, ft/ft		0.025		0.033						
Velocity ⁴ , ft/sec		0.3976		0.4545						
T _t ³ , hr		0.180		0.148						0.3274
Woodland										
Length, ft										
Slope, ft/ft										
Velocity ⁵ , ft/sec										
T _t ³ , hr										0.0000
CHANNEL FLOW										
Waterways & Swamps, No Channels										
Length, ft					219		844	193		
Slope, ft/ft					0.014		0.015	0.073		
Velocity ⁶ , ft/sec					1.404		1.460	3.232		
T _t ³ , hr					0.043		0.161	0.017		0.2204
Grassed Waterways/Roadside Ditches										
Length, ft										
Slope, ft/ft										
Velocity ⁷ , ft/sec										
T _t , hr										0.0000
Small Tributary & Swamp w/Channels										
Length, ft									944	
Slope, ft/ft									0.013	
Velocity ⁸ , ft/sec									2.368	
T _t , hr									0.111	0.1108
Large Tributary										
Length, ft										
Slope, ft/ft										
Velocity ⁹ , ft/sec										
T _t , hr										0.0000
Culvert										
Diameter, ft						2				
Area, ft ²						3.14				
Wetted Perimeter, ft						6.28				
Hydraulic Radius, R, ft						0.5				
Slope, ft/ft						0.025				
Manning's No.						0.024				
Velocity ¹¹ , ft/sec						6.18241315				
Length, L, ft						20				
T _t , hr						0.00090				0.0009
										HR 0.915
										Min 54.92



SUBJECT: Solar Fields Belgrade Subcatchment Pre- and Post-Development Comparison

PROJECT NO.: 389694
CALCULATED: A. DAVIDSON
CHECKED BY: T.DANIELS
DATE: 2020.05.04

LAND USE SUMMARY TABLE

Subcatchment ID: 1S Subcatchment Area: 31.809 Ac.

PRE-DEVELOPMENT CONDITIONS			POST-DEVELOPMENT CONDITIONS			NET CHANGE (Ac.)
Cover Description	CN	Area (Ac.)	Cover Description	CN	Area (Ac.)	
Equipment Pad	98	0.000	Equipment Pad	98	0.008	0.008
Compacted Gravel	96	0.000	Compacted Gravel	96	0.437	0.437
Meadow (HSG B)	58	0.425	Meadow (HSG B)	58	0.425	0.000
Meadow (HSG C)	71	14.426	Meadow (HSG C)	71	14.098	-0.328
Meadow (HSG D)	78	6.783	Meadow (HSG D)	78	6.665	-0.117
Woods, Good (HSG B)	55	1.935	Woods, Good (HSG B)	55	1.935	0.000
Woods, Good (HSG C)	70	5.386	Woods, Good (HSG C)	70	5.386	0.000
Woods, Good (HSG D)	77	1.609	Woods, Good (HSG D)	77	1.609	0.000
Delineated Wetland, PEM/PSS/PFO (HSG D)	79	0.693	Delineated Wetland, PEM/PSS/PFO (HSG D)	79	0.693	0.000
Grass Cover >75% (HSG C)	74	0.463	Grass Cover >75% (HSG C)	74	0.463	0.000
Buildings/Roofs	98	0.019	Buildings/Roofs	98	0.019	0.000
Pavement	98	0.070	Pavement	98	0.070	0.000
Total:	71.8	31.809	Total	72.1	31.809	

Notes:



Description: This calculation determines appropriate outlet stabilization for a culvert or channel based on the selected design storm. Reference: NH DES Stormwater Manual Vol. 2

 =Input Value
 =Calculated

Givens:

L_a = Length of Apron Required, ft
 Q = Discharge from Design Storm, cfs
 D_o = Culvert Diameter or Channel Width, ft
 TW = Tailwater Depth, ft
 W_1 = Width of Apron Required at Discharge, ft
 W_2 = Width of Apron Required at Outlet, ft
 D_{50} = Required Diameter of Rip-Rap, ft

Equations:

$$L_a = \frac{1.8Q}{1.50D_o} + 7D_o \quad \text{When } TW < 0.5D_o$$

$$L_a = \frac{3.0Q}{1.50D_o} + 7D_o \quad \text{When } TW > 0.5D_o$$

$$W_1 = 3D_o$$

$$W_2 = 3D_o + L_a \quad \text{When } TW < 0.5D_o$$

$$W_2 = 3D_o + 0.4L_a \quad \text{When } TW > 0.5D_o$$

$$D_{50} = (0.02Q^{1/3}) / (TW * D_o)$$

Input:

Q = 0.32 cfs 25YR STORM EVENT @ Culvert SD-1 OUTLET
 D_o = 1.25 ft
 TW = 0.24 ft

Output:

	TW <0.5D _o	TW >0.5D _o
L_a =	9.1 ft	L_a = NA ft
W_1 =	3.8 ft	W_1 = NA ft
W_2 =	12.8 ft	W_2 = NA ft
D_{50} =	0.0 ft	D_{50} = NA ft

Attachment C: Construction and Post-Construction Stormwater Inspection & Maintenance Log Examples

STORMWATER MANAGEMENT SYSTEM: INSPECTION & MAINTENANCE LOG				
	SCHEDULE		INITIALS & DATE	COMMENTS
	BIANNUAL	MAINTENANCE		
REVEGETATED AREAS AND EMBANKMENTS				
Inspect revegetated areas and embankments				
Replant bare areas or areas with sparse growth		As Required		
Armor areas with rill erosion with an appropriate lining		As Required		
DRAINAGE CONVEYANCE SYSTEMS				
Inspect swales and areas of concentrated flow for evidence of erosion, debris, woody growth, and excessive sediment accumulation				
Remove any obstructions and accumulated sediments or debris		As Required		
Control vegetated growth and woody vegetation (as allowed)		As Required		
Repair any erosion of the swale lining		As Required		
Mow vegetated swales (as allowed)		As Required		
Clean-out any accumulation of sediment		As Required		
Remove woody vegetation growing through rip-rap		As Required		
Repair any slumping side slopes		As Required		
Replace rip-rap where underlying filter fabric is showing or where stones have dislodged		As Required		
CULVERTS				
Inspect Culvert inlets, outlets, and armoring				
Remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit		As Required		
Repair any erosion damage at the culvert's inlet and outlet		As Required		
ACCESS ROAD SURFACES				
Inspect access road surfaces and shoulders for erosion, false ditches, rutting, or excess accumulation of fines that could impede water flow				
Remove excess fines either manually or with a front-end loader		As Required		
Re-grade roads and shoulders		As Required		
VEGETATED BUFFERS				
Inspect vegetated buffers for existing or developing erosion, rutting, debris, unwanted vegetation				
Correct any erosion/rutting and/or remove debris		As Required		
MAINTENANCE NEEDED AND WHEN:				

CONSTRUCTION STORMWATER SITE INSPECTION REPORT

Solar Fields Parker Station Solar 2.0 MW Solar Array

General Information			
Project Name	Solar Fields Parker Station 2.0 MW Solar Array		
Permit No.		Location	Belgrade, ME
Date of Inspection		Start/End Time	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Describe present phase of construction			
Type of Inspection: <input type="checkbox"/> Regular <input type="checkbox"/> Pre-storm event <input type="checkbox"/> During storm event <input type="checkbox"/> Post-storm event			
Weather Information			
Has there been a storm event since the last inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide: Storm Start Date & Time: Storm Duration (hrs): Approximate Amount of Precipitation (in):			
Weather at time of this inspection? <input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Rain <input type="checkbox"/> Sleet <input type="checkbox"/> Fog <input type="checkbox"/> Snowing <input type="checkbox"/> High Winds <input type="checkbox"/> Other: Temperature:			
Have any discharges occurred since the last inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe:			
Are there any discharges at the time of inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe:			

Site-specific BMPs

- Number the structural and non-structural BMPs identified in your Stormwater Management Report on your site map and list them below (add as many BMPs as necessary). Carry a copy of the numbered site map with you during your inspections. This list will ensure that you are inspecting all required BMPs at your site.
- Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
1		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
9		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes

Overall Site Issues

- Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	Are perimeter controls and sediment barriers adequately installed?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	Are discharge points and receiving waters free of any sediment deposits?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	Are storm drain inlets properly protected?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5	Is the construction exit preventing sediment from being tracked into the street?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	Is trash/litter from work areas collected and placed in covered dumpsters?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
7	Are vehicle and equipment cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8	Are materials that are potential stormwater contaminants stored inside or under cover?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
9	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10	(Other)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

Non-Compliance

Describe any incidents of non-compliance not described above:

CERTIFICATION STATEMENT

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

Print name and title: _____

Signature: _____ Date: _____

Attachment D: Example Stormwater Buffer Deed Restriction

DECLARATION OF RESTRICTIONS

(Forested Buffer, Limited Disturbance)

THIS DECLARATION OF RESTRICTIONS is made this _____ day of _____, 20____,
by _____, _____,
(name) (street address)
_____, _____ County, Maine, _____, (herein referred to as the
(city or town) (county) (zip code)
"Declarant"), pursuant to a permit received from the Maine Department of Environmental Protection under
the Stormwater Management Law, to preserve a buffer area on a parcel of land near
_____.
(road name) (known feature and/or town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(town)
described in a deed from _____ to _____ dated
(name) (name of Declarant)
_____, 20____, and recorded in Book _____ Page _____ at the _____ County
Registry of Deeds, herein referred to as the "property"; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a
portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows: (Note:
Insert description of restricted buffer area location here)

WHEREAS, pursuant to the Stormwater Management Law, 38 M.R.S. Section 420-D and Chapter 500 of
rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"),
Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set
forth herein and has agreed that these restrictions may be enforced by the Maine Department of
Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be
held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set
forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties
having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs,
personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted
Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant
Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express,
shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to
be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set
forth.

- 1. Restrictions on Restricted Buffer Area.** Unless the owner of the Restricted Buffer Area, or any
successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must
remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and
absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit

issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.

- a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material may be placed, stored or dumped on the Restricted Buffer Area, nor may the topography of the area be altered or manipulated in any way;
- b. Any removal of trees or other vegetation within the Restricted Buffer Area must be limited to the following:
 - (i) No purposefully cleared openings may be created and an evenly distributed stand of trees and other vegetation must be maintained. An "evenly distributed stand of trees" is defined as maintaining a minimum rating score of 24 points in any 25 foot by 50 foot rectangle (1,250 square feet) area, as determined by the rating scheme in Table 11:

**Table 11.
Point System for Determining an Evenly
Distributed Stand of Trees**

Diameter of tree at 4½ feet above ground level	Points
2 - 4 inches	1
4 - 8 inches	2
8 - 12 inches	4
>12 inches	8

Where existing trees and other vegetation result in a rating score less than 24 points, no trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;

- (ii) No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;
- c. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole (whether constructed of wood, steel or other materials) and appurtenant equipment such as guys and guy anchors, or fence;
- d. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area;
- e. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if

such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. **Enforcement.** The MDEP may enforce any of the Restrictions set forth in Section 1 above.
3. **Binding Effect.** The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.
4. **Amendment.** Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.
5. **Effective Provisions of Declaration.** Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.
6. **Severability.** Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.
7. **Governing Law.** This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

(NAME)

STATE OF MAINE _____ County, _____, 20__.
(County) (date)

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

Notary Public

DECLARATION OF RESTRICTIONS

(Forested Buffer, No Disturbance)

THIS DECLARATION OF RESTRICTIONS is made this _____ day of _____, 20____,
by _____, _____,
(name) (street address)
_____, _____ County, Maine, _____, (herein referred to as the
(city or town) (county) (zip code)
"Declarant", pursuant to a permit received from the Maine Department of Environmental Protection under
the Stormwater Management Law, to preserve a buffer area on a parcel of land near
_____, _____.
(road name) (known feature and/or town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(town)
described in a deed from _____ to _____, dated
(name) (name of Declarant)
_____, 20____, and recorded in Book ____ Page ____ at the _____ County
Registry of Deeds, herein referred to as the "property"; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a
portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows: (Note:
Insert description of restricted buffer location here)

WHEREAS, pursuant to the Stormwater Management Law, 38 M.R.S. Section 420-D and Chapter 500 of
rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"),
Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set
forth herein and has agreed that these restrictions may be enforced by the Maine Department of
Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be
held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set
forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties
having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs,
personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted
Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant
Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express,
shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to
be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set
forth.

1. **Restrictions on Restricted Buffer Area.** Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.
 - a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Restricted Buffer Area, nor shall the topography of the area be altered or manipulated in any way;
 - b. No trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;
 - c. No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;
 - d. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence (whether constructed of wood, steel or other materials) and appurtenant equipment such as guys and guy anchors;
 - e. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area;
 - f. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. **Enforcement.** The MDEP may enforce any of the Restrictions set forth in Section 1 above.
3. **Binding Effect.** The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.
4. **Amendment.** Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.

5. **Effective Provisions of Declaration.** Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.
6. **Severability.** Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.
7. **Governing Law.** This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

(NAME)

STATE OF MAINE, _____ County, dated _____, 20__.
(County)

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

Notary Public

DECLARATION OF RESTRICTIONS

(Non-Wooded Meadow Buffer)

THIS DECLARATION OF RESTRICTIONS is made this _____ day of _____, 20____, by

_____, _____
(name) (street address)
_____, _____ County, Maine, _____, (herein referred to as the
(city or town) (county) (zip code)

"Declarant"), pursuant to a permit received from the Maine Department of Environmental Protection under the Stormwater Management Law, to preserve a buffer area on a parcel of land near

_____, _____.
(road name) (known feature and/or town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(town)

described in a deed from _____ to _____, dated
(name) (name of Declarant)

_____, 20____, and recorded in Book ____ Page ____ at the _____ County
Registry of Deeds, herein referred to as the "property"; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows: (Note: Insert description of restricted buffer location here)

WHEREAS, pursuant to the Stormwater Management Law, 38 M.R.S. Section 420-D and Chapter 500 of rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"), Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1. **Restrictions on Restricted Buffer Area.** Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.
 - a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Restricted Buffer Area, nor may the topography or the natural mineral soil of the area be altered or manipulated in any way;
 - b. A dense cover of grassy vegetation must be maintained over the Restricted Buffer Area, except that shrubs, trees and other woody vegetation may also be planted or allowed to grow in the area. The Restricted Buffer Area may not be maintained as a lawn or used as a pasture. If vegetation in the Restricted Buffer Area is mowed, it may be mown no more than two times per year.
 - c. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence (whether constructed of wood, steel or other materials) and appurtenant equipment such as guys and guy anchors;
 - d. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area, except for vehicles used in mowing;
 - e. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. **Enforcement.** The MDEP may enforce any of the Restrictions set forth in Section 1 above.
3. **Binding Effect.** The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.
4. **Amendment.** Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.
5. **Effective Provisions of Declaration.** Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.

6. **Severability.** Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.
7. **Governing Law.** This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

(NAME)

STATE OF MAINE, _____, County, dated _____, 20__ .
(County)

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

Notary Public

BELGRADE COMMERCIAL DEVELOPMENT REVIEW ORDINANCE APPLICATION SUBMISSIONS CHECKLIST



(To be completed by Planning Board chair during review of all applications with exception of Special Permit for 5 year renewals of existing mining operations. Checklist may serve as useful guidance to applicants to ensure application includes all needed maps and attachments to be found complete)

Applicant Name: Solar Fields LLC c/o Steve Buchsbaum

Development Name: Solar Array

Fee paid: _____ \$50.00 (land only) ☒ \$100.00 (buildings & land)

☒ Notice provided by CEO to land owners within 500' 6/5/2020 Mailed

____ Notice provided by CEO to municipality within 500' ☒ Not applicable

Complete	Not Applicable	Waiver Request Approved	Application Submission
<input checked="" type="checkbox"/>			Application form
<input checked="" type="checkbox"/>			Applicant's agent authorization letter
<input checked="" type="checkbox"/>			Copy of deed, option, sales agreement, lease or other documentation of title, right or interest
<input checked="" type="checkbox"/>			Written waiver request
<input checked="" type="checkbox"/>			Copy of tax map of property
<input checked="" type="checkbox"/>			Copy of Kennebec Co. soil map of property
<input checked="" type="checkbox"/>			Copy of USGS topographic map showing property location
	<input checked="" type="checkbox"/>		Copy of Belgrade Shoreland Zoning map showing property location
<input checked="" type="checkbox"/>			Copy of Flood Insurance Map showing property
<input checked="" type="checkbox"/>			Copy of National Wetlands Inventory Map showing property
<input checked="" type="checkbox"/>			Copy of Maine Geological Survey Significant Sand and Gravel Aquifer map showing property location

Complete	Not Applicable	Waiver Request Approved	Application Submission
✓			Copy of Maine Drinking Water Program map of public drinking water supplies showing property location
			Copy of MDOT Highway Entrance or Access Permit
	✓		Copy of MDOT Traffic Movement Permit & traffic movement study
✓			Copies of other required State or local permits
✓			1 24x36" Site Development Plan drawn to scale showing at minimum the following: scale, north arrow, parcel boundaries, location and dimensions of existing and proposed buildings and structures, drainage structures, signs, fencing, exterior lights, location and extent of disturbed area, layout and dimensions of impervious surfaces, parking, driveways, roads, outdoor storage areas of equipment/inventory/dumpsters/other materials, location of bulk storage of petroleum/hazardous substances ³ /propane, utilities, drainage ways, easements, rights of way, location of flood hazard areas/water courses/ water bodies/wetlands, Shoreland Zoning districts, location of existing vegetation to be retained, location of vegetated buffers/screening along public roads & property lines and around outdoor storage areas, landscaping, location of wells & source water protection area if public drinking water supply, location of soil test pits and subsurface waste water disposal system(s), other significant natural/physical features, name/address of owner/applicant, and name/address/license number/stamp of professional engineer/surveyor who prepared site plan.

³ Hazardous substances most likely encountered will be degreasers and other solvents used for parts cleaning in vehicle repair, waste oil and gasoline, waste antifreeze, solvents used in auto body shops, solvents used in dry cleaning, wood treatment chemicals, pesticides, and pool chemicals like chlorine.

Complete	Not Applicable	Waiver Requested & Approved	Application Submission
✓			Detail to-scale drawings showing location and construction specifications of drainage features, roads, sidewalks, access points, driveways, parking, traffic control features, fire control structures, and public improvements
✓	✓		Documentation meets applicable State/Federal air quality regulatory requirements
			Soil erosion control plan (Art. 6, Sec. 3)
			MDEP certified contractor name/#
	✓		Location of site/structure listed on National Register of Historic Places
	✓		Location of Me. Historic Preservation Commission archeological sites
	✓		Information needed to meet Air Quality standard (Article 6, Sec. 1)
	✓		Information needed to meet Access to Public Streets standard (Article 6, Sec. 2)
	✓		Protection measures for Historic and Archeological Resources (Art. 6, Sec.4)
✓			Estimated quantities of flammable, combustible and hazardous substances to be stored, handled, or generated, including waste oil and anti-freeze
	✓		Evidence meets MDEP siting regulations for oil storage and hazardous substance facilities
✓			Copy of application provided to Fire Chief by Planning Board or CEO
	✓		Other information needed to meet Material Storage standard, including bulk storage of combustible and flammable materials, and hazardous substances (Article 6, Sec. 5)
	✓		Visual impact assessment
	✓		Plan based on IF&W/Critical Areas Program recommendations to mitigate impact on Natural Areas and Wildlife Habitat, including deer wintering areas
	✓		Other information needed to meet Natural Resource Protection standard (Art. 6, Sec. 6)

Complete	Not Applicable	Waiver Requested & Approved	Application Submission
	✓		Is Board requiring post development noise monitoring and reporting plan? If not required, mark "Not Applicable". If required, mark "complete" upon receipt
	✓		Information needed to meet Noise standard (Article 6, Sec. 7)
✓			Exterior lighting plan & specifications for lighting fixtures
	✓		Is Board requiring post development light monitoring and reporting plan? If not required, mark "Not Applicable". If required, mark "complete" upon receipt.
✓	✓		Information to meet Parking standard (Article 6, Sec.9)
			Written statement from Fire Chief on capacity of Fire Dept. to provide adequate protection
✓			Written statement from Sheriff's Dept. approving any proposed security measures
			Other information to meet Public Safety and Emergency Services standard (Article 6, Sec. 10)
✓			Information to meet Screening of Structures, Parking Lots, and Other Non-residential Uses standard (Article 6, Sec. 11)
	✓		To scale profile(face-on) view of proposed signs
	✓		Other information to meet Sign standard (Article 6, Sec. 12)
✓			Stormwater Management Plan
✓			Other information to meet Stormwater Management standard (Article 6, Sec. 13)
	✓		Subsurface waste disposal site evaluation form (HHE-200)
	✓		Other information to meet Wastes standard (Article 6, Sec. 14)
	✓		Groundwater quality and quantity impact assessment
	✓		Copy of deed restrictions related to drinking water and ground water protection

22

Complete	Not Applicable	Waiver Requested & Approved	Application Submission
	✓		Copy of Maine Drinking Water Program public water supply approval & source water protection plan
✓			Copy of MDEP Stormwater Management Permit
✓			Phosphorous export control method
✓			Other information to meet Water Quality standard (Article 6, Sec. 15)
	✓		Supplemental site plan requirements for mineral extraction operations
	✓		5 year mining/reclamation plan
	✓		Mineral extraction/processing operating procedure and hours
	✓		Hydrogeological study of ground water movement & quality
	✓		Written extraction/processing buffer agreement with abutter
	✓		Reclamation Plan for extraction/processing operations
	✓		Design/operation details of stationary petroleum storage and equipment fueling
	✓		Other information to meet Mineral Extraction and Processing Operations standards (Article 7, Sec. 1)
	✓		Information to meet Overnight Accommodations standard (Article 7, Sec. 2)
	✓		Visual impact assessment of telecommunication tower if located on lake shore or hilltop
	✓		Maine registered professional engineer certification of telecommunication tower design
	✓		Other information to meet Telecommunications Tower standards (Article 7, Sec. 3)
	✓		Visual impact assessment for wind turbine taller than 100'
	✓		Impact study of wind turbine on wildlife
	✓		Identification of roads to be used for turbine transport

Complete	Not Applicable	Waiver Requested & Approved	Application Submission
	✓		Hiring of engineer by Town at applicant's expense to document road conditions prior to use and damage after use
	✓		Emergency response plan during equipment transport
	✓		Turbine general liability certificate of insurance

Printed Name Planning Board Chair or Designee

Chair or Designee Signature

Date



Maine Department of Transportation

Janet T. Mills
Governor

Driveway/Entrance Permit

Bruce A. Van Note
Commissioner

Permit Number: 28041 - Entrance ID: 1

OWNER		LOCATION	
Name:	Steven M. Buchsbaum & Regina A. Coppens	Route:	0135X, Manchester Road
Address:	376 West Road Belgrade, ME 04917	Municipality:	Belgrade
Telephone:	(207)877-4477	County:	Kennebec
		Tax Map:	7 Lot Number: 25B
		Culvert Size:	15 inches
		Culvert Type:	metal/plastic
		Culvert Length:	30 feet
Date Printed:	May 13, 2020	Date of Permit:	May 13, 2020
		Approved Entrance Width:	22 feet

In accordance with rules promulgated under 23 M.R.S.A., Chapter 13, Subchapter I, Section 704, the Maine Department of Transportation (MaineDOT) approves a permit and grants permission to perform the necessary grading to construct, in accordance with sketch or attached plan, a **Driveway to Office Space** at a point **2995 feet North** from **Minot Hill Road**, subject to the Chapter 299 Highway Driveway and Entrance Rules, standard conditions and special conditions (if any) listed below.

Conditions of Approval:

This Permittee acknowledges and agrees to comply with the Standard Conditions and Approval attached hereto and to any Specific Conditions of Approval shown here.

(G = GPS Location; W = Waiver; S = Special Condition)

G - THE ENTRANCE SHALL BE LOCATED AT GPS COORDINATES: 44.458255N, -69.849796W.

S - THE ENCLOSED NOTICE OF AUTHORIZATION TO PROCEED MUST BE POSTED IN A LOCATION CLEARLY VISIBLE FROM THE ROADWAY FROM AT LEAST 24 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION TO ONE MONTH AFTER THE CONCLUSION OF THE CONSTRUCTION.

S - OWNER IS RESPONSIBLE FOR ANY AND ALL CULVERT(S) AND MUST DITCH TO ENSURE WATER FLOWS ADEQUATELY THRU CULVERT(S) AND AT NO TIME ALLOW WATER TO FLOW INTO OR ONTO THE HIGHWAY.

S - THIS ACCESS IS LIMITED TO THE APPROVED USE ONLY. ANY CHANGE IN THE USE AT THIS ACCESS WILL REQUIRE ADDITIONAL PERMIT APPROVAL OR MAY BE PROHIBITED.

S - PERMITTEE MUST KEEP BUSHES & ALL VEGETATION CUT BACK AND CLEARED AS GENERAL MAINTENANCE OF SIGHT DISTANCE FOR DRIVEWAYS OR ENTRANCES.

S - ENTRANCE MUST NOT BE USED TO PROVIDE ACCESS TO ANY PORTION OF A SUBDIVISION.

Approved by:  Date: 5/18/2020

STANDARD CONDITIONS AND APPROVAL

1. Provide, erect and maintain all necessary barricades, lights, warning signs and other devices as directed by MaineDOT to properly safeguard traffic while the construction is in progress.
2. At no time cause the highway to be closed to traffic
3. Where the driveway is located within a curb, curb and gutter, and/or sidewalk section, completely remove the existing curb, curb and gutter, and/or sidewalk as may be required to create the driveway and restore drainage. All driveways abutting sidewalk sections shall meet the requirements set forth in the Americans with Disabilities Act of 1990, 42 U.S.C. Sec. 12131 et seq.
4. Obtain, have delivered to the site, and install any culverts and/or drainage structures which may be necessary for drainage, the size, type and length as called for in the permit pursuant to 23 M.R.S.A. Sec. 705. All culverts and/or drainage structures shall be new.
5. Start construction of the proposed driveway within twenty-four (24) months of the date of permit issuance and substantially complete construction of the proposed driveway within twelve months of commencement of construction.
6. Comply with all applicable federal, state and municipal regulations and ordinances.
7. Do not alter, without the express written consent of the MaineDOT, any culverts or drainage swales within the MaineDOT right of way.
8. File a copy of the approved driveway permit with the affected municipality or LURC, as appropriate within 5 business days of receiving the MaineDOT approval.
9. Construct and maintain the driveway side slopes to be no steeper than the adjacent roadway side slopes, but in no case to be steeper than 3 horizontal to 1 vertical, unless the side slope is behind existing roadway guardrail, in which case it shall be no steeper than 2 horizontal to 1 vertical.
10. Notify the MaineDOT of a proposed change of use served by the driveway when increase in traffic flow is expected to occur. This does not exempt the need for obtaining a Traffic Movement Permit (TMP) if trip generation meets or exceeds 100 passenger car equivalents (PCE) during the peak hour of the day.
11. Construct or implement and maintain erosion and sedimentation measures sufficient to protect MaineDOT facilities.
12. Driveways shall be designed such that all maneuvering and parking of any vehicles will take place outside the highway right-of-way and where vehicles will exit the premises without backing onto the highway traveled way or shoulders. All driveways will have a turnaround area to accommodate vehicles using the premises.
13. Closing any portion of a highway or roadway including lanes, shoulders, sidewalks, bike lanes, or ATV access routes is not permitted without MaineDOT approval.

FURTHER CONDITION OF THE PERMIT

The owner shall assume, the defense of, and pay all damages, fines, and penalties for which he/she shall become liable, and shall indemnify and safe harmless said Department, its representatives, agents and employees from liability, actions against all suits, claims, damages for wrongful death, personal injuries or property damage suffered by any person or association which results from the willful or negligent action or inaction of the owner/applicant (agent) and in proceedings of every kind arising out of the construction and maintenance of said entrance(s), including snow removal.

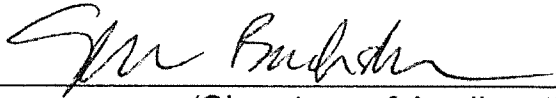
Nothing herein shall, nor is intended to, waive any defense, immunity or limitation of liability which may be available to the MaineDOT, their officers, agents or employees under the Maine Tort Claims Act or any other privileges and/or immunities provided by law. It is a further condition that the owner will agree to keep the right of way inviolate for public highway purposes and no signs (other than traffic signs and signals), posters, billboards, roadside stands, culvert end walls or private installations shall be permitted within Right of Way limits.

PLEASE READ AND SIGN:

I certify that to the best of my knowledge the information submitted in this application and the attached materials are true, correct and accurate. I understand that before this application can be determined to be complete by the Town of Belgrade; all requested information must be submitted.

Solar Fields LLC c/o Steven Buchsbaum

(Name of Applicant - printed)

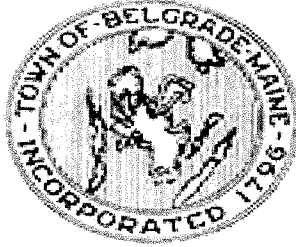


(Signature of Applicant)

6/4/20

(Date)

*Submit this form, site plan and required attachments to the Town of
Belgrade Code Enforcement Officer*



**TOWN OF BELGRADE PLANNING BOARD
FINDINGS OF FACT AND CONCLUSIONS OF LAW
UNDER THE TOWN OF BELGRADE
COMMERCIAL DEVELOPMENT REVIEW ORDINANCE**

IN THE MATTER OF:

Project Name: _____

Applicant Name: _____

Applicant Mailing Address: _____

Name of Applicant's Authorized Representative (if any): _____

Project Road Location: _____ Map _____ Lot _____

DECISION: ☐ *Approval* ☐ *Approval with conditions* ☐ *Denial*

TO THE TOWN OF BELGRADE CODE ENFORCEMENT OFFICER:

Pursuant to the Belgrade Commercial Development Review Ordinance as last amended on March 17, 2017, the Town of Belgrade Planning Board ("Board") has considered the application of _____ (*name of applicant*) ("Applicant") including its site plan, other supporting materials and documentation, public meeting testimony and other related materials contained in the record, and makes the following Findings of Fact and Conclusions of Law:

1. Application Summary.
from

a. Project summary/type: _____

b. Was waiver request submitted: ____ Yes ____ No

2. Application Review Process.

()

Date application accepted as complete: _____

Was site visit conducted: ____ Yes ____ No Date of site visit: ____/____/____

List of site visit attendees: _____

Board meeting date(s): _____

Date Board rendered final decision: ____/____/____

3. Review Criteria Findings.

- a. The Board finds that the application for the subject project is complete and the applicable application fee has been paid in full to the Town. Application materials, site plan and supporting documentation has been submitted by the applicant and are retained in the project file maintained in the Belgrade Town Office under the project name.

The applicant has requested in writing that the Board waive the following ordinance application requirements and review standards: *(list, include ordinance section no.)*

The applicant has provided supporting documentation to demonstrate to the Board's satisfaction that the following ordinance requirements or standards are not applicable due to the proposed project's size, site conditions, design, type or other unique features. This documentation includes the following: *(list and date)*

AND/OR

The applicant has failed to provide adequate supporting documentation to demonstrate to the Board's satisfaction that the applicant's proposal meets the ordinance criteria for a waiver from the following requirements or standards: *(list and date)*

The Board finds that the project ☐ will not ☐ will cause unreasonable soil erosion or a reduction in the land's capacity to hold water so that an unsound or unhealthy condition exists (ref. Article 6 standards, sections 3 and 13) based on application submittals the project's design plan dated _____ and soil erosion control plan, dated ____/____/____, OR the applicant did not submit a soil erosion control plan.

- b. The Board finds that the project ☐ will not ☐ will have an adverse impact on freshwater wetlands (ref. Article 6 standards, sections 3 and 6) based on *(give reasons e.g. cite application submittals, or the lack thereof, that support this finding)*
-
-
-
-

- c. The Board finds that the project ☐ will not ☐ will have an adverse impact on a lake, pond or stream (ref. Article 6 standards, sections 13, and 15) based on *(give reasons, e.g cite application submittals, or the lack thereof, that support this finding)*
-
-
-

-
- d. The Board finds that the project ☐ will not ☐ will provide for adequate storm water management (ref. Article 6 standards, section 13) based on *(give reasons, e.g. cite application submittals, or lack thereof, that support this finding)*.

-
-
-
- e. The Board finds that the project ☐ will not ☐ will provide adequate sewage disposal (ref. Article 6 standards, sections 14 and 15) based on *(give reasons, e.g. cite application submittals, or the lack thereof, that support this finding)*

The Board finds that the project ☐ is not ☐ is located in a flood plain area and *(conforms/does not conform)* with the Belgrade Flood Plain Ordinance based on *(give reasons, e.g. cite application submittals, or the lack thereof, that support this finding)*.

-
-
-
- f. The Board finds that the project ☐ will not ☐ will result in air or water pollution (ref. Article 6 standards, sections 1, 13.H and 15) based on *(give reasons, e.g. cite application submittals, or the lack thereof, that support this finding)*

- g. The Board finds that the project ☐ *will not* ☐ *will* have sufficient drinking water for current and foreseeable needs of the development (ref. Article 6 standards, section 15.A) based on (*give reasons, e.g. cite application submittals, or the lack thereof, that support this finding*).

- h. The Board finds that the project, along or in conjunction with existing activities, ☐ *will not* ☐ *will* adversely impact the quality or quantity of ground water (ref. Article 6 standards, sections 5 and 15.A) based on (*give reasons, e.g. cite application submittals, or the lack thereof, that support this finding*).

- i. The Board finds that the proposed activity will dispose of all solid waste in conformance with all local regulations and that the type and quantity of waste proposed to be sent to the Town transfer facility ☐ *will not* ☐ *will* exceed its capacity (ref. Article 6 standards, section 14.A) based on (*give reasons, e.g. cite application submittals that support this finding*).

-
-
- j. The Board finds that the project ☐ *will not* ☐ *will* have a significant detrimental effect on adjacent land uses and properties effected by waste, noise, glare, lighting, fumes, smoke, dust, odors or their effects from the project (ref. Article 6 standards, sections 1, 11, 12, and 15.A) based on *(give reasons, e.g. cite application submittals, or the lack thereof, that support this finding)*.
-
-
-
-

- k. The Board finds that the project ☐ *will not* ☐ *will* cause unreasonable highway or public road congestion, or uns ☐ condition ☐ h respect to the use of existing or proposed highways or roads (ref. Article 6 standards, sections 2 and 9) based on *(give reasons, e.g. cite application submittals, or the lack thereof, that support this finding)*.
-
-
-
-

- l. The Board finds that the project to the maximum extent possible ☐ *will not* ☐ *will* have an adverse effect on the scenic or natural beauty of the area, aesthetics, historic and archeological sites, or any public rights for physical or visual access to the shoreline of a water body (ref. Article 6 standards, sections 4, 5.A, 6 , 11 and 12) based on *(give reasons, e.g. cite application submittals, or the lack thereof, that support this finding)*.

- m. The Board finds that the project to the maximum extent possible ☐ *will not* ☐ *will* have an adverse effect on significant wildlife habitat and ☐ critical natural areas identified by the Maine Beginning with Habitat Program, Maine Department of Inland Fisheries and Wildlife Maine Department of Conservation Critical Natural Areas Program, or the Town of Belgrade Comprehensive Plan(ref. Article 6 standards, section 6.B) based on *(give reasons, e.g. cite application submittals, or the lack thereof, that support this finding)*.

- o. The Board finds that the project ☐ *does not conform* ☐ *conforms* with all other applicable Town of Belgrade ordinances, including but not limited to Shoreland Zoning, Minimum Lot Size, Subdivision, Multi-Family Dwelling, Manufactured Housing and Mobile Home Park, Solid Waste and Recycling, Municipal Street and Road, Adult Business, Supplemental Junkyard and Auto Graveyard and Tree ordinances, based on *(give reasons, e.g. cite application submittals, or the lack thereof, that supports this finding)*.

- p. The Board finds that the project *will not* ☐ *will* ☐ unreasonably increase the concentration of phosphorous in a great pond (ref. Article 6 standards, section 15) based on *(give reasons, e.g. cite application submittals, or the lack thereof, that supports this finding)*.

- q. The Board finds that the project *will not* ☐ *will* conform to material storage provisions of this Ordinance (ref. Article 6, section 5) based on *(give reasons, e.g. cite application submittals, or lack thereof, that supports this finding)*:

- r. The Board finds that the applicant ☐ *has* ☐ *does not have* sufficient right, title, or interest to undertake the development based on: *(give reasons, e.g. cite applications submittals, or lack thereof, that supports this finding)*

- s. The Board finds that the applicant ☐ *does* ☐ *does not* provide for safe and adequate parking (ref. Article 6, Section 9) based on: *(give reasons, e.g. cite application submittals, or lack thereof, that supports this finding)*

- t. The Board finds that the project ☐ *will not* ☐ *will* conform to all applicable provisions of this Ordinance, including but not limited to Development Standards for Specific Activities, where applicable (ref. Article 7) based on: *(give reasons, e.g. cite application submittals, or the lack thereof, that supports this finding)*

THEREFORE, the Town of Belgrade Planning Board approves, subject to the following Conditions, the application of _____ to develop and use the _____ as described in the Review Criteria Findings above.

OR

THEREFORE, the Town of Belgrade Planning Board denies the application of _____ to develop and use the _____ as proposed for failure to meet the requirements of the Commercial Development Review Ordinance for the reasons described in the Review Criteria Findings above.

STANDARD CONDITIONS OF APPROVAL (To be included in all approvals)

1. If construction has not been substantially started within 12 months of Board approval, this approval and the subsequent permit from the Belgrade Code Enforcement Officer are null and void (ref. Article 4, section 4).
2. The Board approval of this project as described above is limited to that described in the application, and depicted in the accompanying plan and other application submissions. Except to the extent that the Board has expressly indicated in this document that certain depictions may be revised by the applicant without further review and approval by the Board, any changes to the application, site plan and other supporting application submissions must receive prior approval by the Board, including but not limited to changes in the proposed location of structures, roads, parking, vehicle entrance and exit, wells, subsurface waste water systems, the method of waste disposal, the extent and location of vegetated areas, materials storage, outdoor lighting and signage, and methods of storm water and phosphorous runoff control.

3. Unless a waiver from a specific ordinance standard has been requested by the applicant in writing and approved by the Board, the development or use is required to meet all applicable ordinance standards.
4. This Board approval and its associated permit from the Code Enforcement Officer is transferable to subsequent owners of the property. All subsequent owners are required to comply with the conditions of the project's Board approval.

PROJECT SPECIFIC CONDITIONS OF APPROVAL

1. _____

2. _____

3. _____

Peter Rushton, Chair (signature)
Town of Belgrade Planning Board

Date

SOLAR FIELDS, LLC

PROPOSED 2.0MWAC SOLAR ARRAY

242 MANCHESTER RD (ROUTE 135), BELGRADE, KENNEBEC COUNTY, MAINE

PREPARED FOR:

Solar
Fields

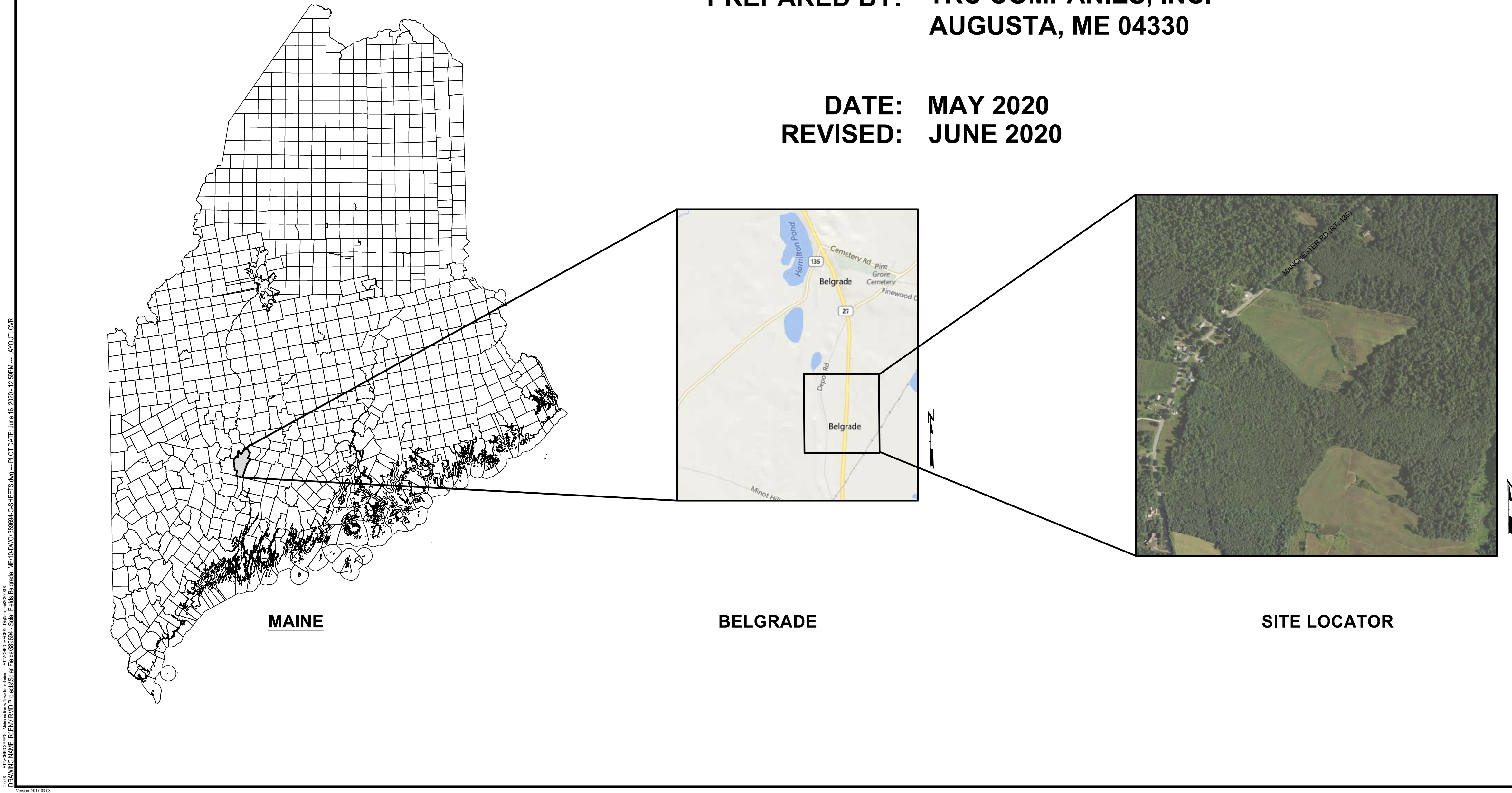
SOLAR FIELDS, LLC
376 WEST ROAD
BELGRADE, ME 04917

PREPARED BY: TRC COMPANIES, INC.
AUGUSTA, ME 04330

DATE: MAY 2020
REVISED: JUNE 2020

APPROVED: TOWN OF BELGRADE PLANNING BOARD		
SIGNATURE	DATE	APPROVED
		<input type="checkbox"/>
		<input type="checkbox"/>
		<input type="checkbox"/>
		<input type="checkbox"/>
		<input type="checkbox"/>
		<input type="checkbox"/>
		<input type="checkbox"/>

SHEET INDEX	
SHEET NUMBER	SHEET TITLE
G-1	CIVIL COVER SHEET
G-2	GENERAL NOTES & LEGEND
G-3	EROSION CONTROL NOTES & DETAILS
C-1	EXISTING CONDITIONS PLAN
C-2	SITE GRADING & DRAINAGE PLAN
C-3	CIVIL CONSTRUCTION DETAILS
C-4	ELECTRICAL DETAILS
C-5	LANDSCAPING NOTES & DETAILS
SW-1	PRE-DEVELOPMENT DRAINAGE PLAN
SW-2	POST-DEVELOPMENT DRAINAGE PLAN



THOMAS N. DANIELS
10000
2020-06-10
PROFESSIONAL ENGINEER

PERMITTING

NOTE: THESE PLANS ARE ACCOMPANIED BY COMMERCIAL DEVELOPMENT REVIEW AND STORMWATER MANAGEMENT APPLICATIONS OF THE SAME TITLE. THESE DOCUMENTS ARE INTERRELATED AND ARE INTENDED TO BE USED TOGETHER FOR PERMITTING PURPOSES ONLY.

NOT FOR CONSTRUCTION

14 Gabriel Drive
Augusta, ME 04330
Phone: 207.620.3800
www.trcsolutions.com

GENERAL NOTES

1. THE PROJECT HORIZONTAL COORDINATES SYSTEM IS BASED ON NAD83 MAINE STATE PLANE (US SURVEY FEET, WESTERN ZONE, ME83-WF). ELEVATIONS ARE BASED ON NAVD88 (US SURVEY FEET).
2. TOPOGRAPHIC SURVEY INFORMATION DATA IS COMPILED FROM AERIAL MAPPING (LIDAR) PROVIDED BY THE MAINE OFFICE OF GIS AND SHOULD BE CONSIDERED TO BE APPROXIMATE.
3. PROJECT PROPERTY BOUNDARIES ARE BASED ON INFORMATION PROVIDED IN A SURVEY PLAN BY GARBACICK SURVEYORS OF AUGUSTA, ME AS WELL AS TOWN OF BELGRADE TAX MAPS.
4. EXISTING UTILITIES ARE APPROXIMATE AND SHOULD BE VERIFIED BY CONTRACTOR. DIGSAFE SHALL BE NOTIFIED A MINIMUM OF 72-HOURS PRIOR TO COMMENCING ANY EXCAVATION.
5. THIS IS A PRELIMINARY DESIGN PLAN. FINAL DESIGN SHALL BE MODIFIED BY CONTRACTOR TO MATCH FINAL ELECTRICAL INTERCONNECTION STUDIES, EQUIPMENT PURCHASED, AND POSSIBLE PERMIT CONSTRAINTS REVEALED DURING PROJECT'S REVIEW.
6. ALL WORK DETAILED ON THESE PLANS AND PERFORMED UNDER THIS CONTRACT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, THE PROJECT GEOTECHNICAL REPORT, AND ANY OTHER APPLICABLE TECHNICAL REPORTS. WHERE INDICATED, STATE AND/OR LOCAL STANDARD SPECIFICATIONS SHALL APPLY.
7. THE CONTRACTOR SHALL ABIDE BY ALL LOCAL, STATE, AND FEDERAL LAWS, RULES AND REGULATIONS WHICH APPLY TO THE CONSTRUCTION OF THESE IMPROVEMENTS, INCLUDING STATE AND FEDERAL REQUIREMENTS WITH RESPECT TO STORMWATER DISCHARGE.
8. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITY LINES WITHIN OR ADJACENT TO THE CONSTRUCTION AREA. ANY DAMAGE TO EXISTING FACILITIES CAUSED BY CONSTRUCTION ACTIVITY SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.
9. CONSTRUCTION SHALL NOT OCCUR IN ANY PUBLIC RIGHTS OF WAY, PUBLIC OR PRIVATE EASEMENTS, BEYOND THE LIMITS OF DISTURBANCE, OR OUTSIDE THE PROPERTY LIMITS WITHOUT NECESSARY PERMITS. ANY PUBLIC OR PRIVATE PROPERTY OR IMPROVEMENTS DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED TO THE SATISFACTION OF THE OWNER AT THE COST OF THE CONTRACTOR.
10. OVERNIGHT PARKING OF CONSTRUCTION EQUIPMENT SHALL NOT OBSTRUCT DRIVEWAYS OR DESIGNATED TRAFFIC LANES. THE CONTRACTOR SHALL NOT STORE ANY EQUIPMENT OR MATERIAL WITHIN THE PUBLIC RIGHT OF WAY. OVERNIGHT PARKING OF CONSTRUCTION VEHICLES ON PRIVATE PROPERTY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
11. ALL PROPERTY CORNERS OR MONUMENTS DESTROYED DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. ALL PROPERTY CORNERS MUST BE RESET BY A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF MAINE.
12. CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS CONTROLLING THE POLLUTION OF THE ENVIRONMENT.
13. CONTRACTOR TO ENSURE ALL WORK PERFORMED IS IN ACCORDANCE WITH EXISTING PROJECT PERMITS, STUDIES, AND REPORTS PROVIDED IN THE CONTRACT DOCUMENTS INCLUDING STATE STORMWATER MANAGEMENT PERMIT AND LOCAL ORDINANCE.
14. IT IS THE INTENT OF THESE PLANS THAT THE CONTRACTOR SHALL NOT PERFORM ANY WORK OUTSIDE THE IDENTIFIED PROJECT BOUNDARIES AND CLEARING LIMITS.
15. IT IS THE INTENT OF THESE PLANS THAT THE CONTRACTOR AVOID "FILLING" WETLANDS AT ALL COSTS. CONTRACTOR TO AVOID THE DELINEATED WETLAND AREAS AND NATURAL RESOURCES ONSITE.
16. WHENEVER PRACTICABLE, NO DISTURBANCE ACTIVITIES SHOULD TAKE PLACE WITHIN 50 FEET OF ANY PROTECTED NATURAL RESOURCE. IF DISTURBANCE ACTIVITIES SHOULD TAKE PLACE UPGRADIENT TO AND BETWEEN 30 FEET AND 50 FEET OF ANY PROTECTED NATURAL RESOURCE, PERIMETER EROSION CONTROLS MUST BE DOUBLED. IF DISTURBANCE ACTIVITIES TAKE PLACE UPGRADIENT TO AND LESS THAN 30 FEET FROM ANY PROTECTED NATURAL RESOURCE, PERIMETER EROSION CONTROLS MUST BE DOUBLED AND DISTURBED AREAS MUST BE TEMPORARILY OR PERMANENTLY STABILIZED WITHIN 7 DAYS. ALL AREAS WITHIN 75 FEET OF A PROTECTED NATURAL RESOURCE MUST BE PROTECTED WITH A DOUBLE ROW OF SEDIMENT BARRIERS NOVEMBER 1 THROUGH APRIL 15.
17. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THE PROJECT.
18. CONTRACTOR SHALL FIELD FIT ALL PROPOSED CULVERT INVERTS TO PROVIDE POSITIVE DRAINAGE IN THE DIRECTION OF EXISTING SLOPES. ALL CULVERTS TO BE INSTALLED AT ADEQUATE DEPTHS AND TO DAYLIGHT. INLETS AND OUTLETS OF ALL CULVERTS TO BE STABILIZED WITH RIP RAP IN ACCORDANCE WITH THE SITE GRADING & DRAINAGE PLAN.
19. EXISTING ACCESS ROADS TO BE MAINTAINED SHALL BE PROOF ROLLED, SMOOTHED, AND RESURFACED AS NECESSARY TO PROVIDE AN ACCEPTABLE SURFACE.
20. THE CONTRACTOR SHALL SECURE PERMITS FROM THE STATE AND TOWN OF BELGRADE AS NECESSARY BEFORE DRIVING CONSTRUCTION EQUIPMENT OVER AND ACROSS STATE AND TOWN MAINTAINED ROADS.
21. ALL WORK IN THE PUBLIC RIGHTS OF WAY SHALL CONFORM WITH THE MAINE DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS".
22. WETLANDS AND NATURAL RESOURCES WERE DELINEATED BY BURMAN LAND & TREE COMPANY, LLC IN APRIL OF 2020.

HOUSEKEEPING NOTES

CONTRACTOR SHALL MAINTAIN THE PROJECT SITE IN ACCORDANCE WITH THE FOLLOWING PERFORMANCE STANDARDS:

1. **SPILL PREVENTION:** CONTROLS SHALL BE IN PLACE TO PREVENT POLLUTANTS FROM BEING DISCHARGED FROM MATERIALS USED AND STORED ONSITE. APPROPRIATE CONTROLS INCLUDE, BUT ARE NOT LIMITED TO, PROPER STORAGE PRACTICES THAT MINIMIZE EXPOSURE OF MATERIALS TO STORMWATER, AND APPROPRIATE SPILL PREVENTION, CONTAINMENT, AND RESPONSE PLANNING AND IMPLEMENTATION.
2. **GROUNDWATER PROTECTION:** DURING CONSTRUCTION, THE CONTRACTOR MAY NOT STORE OR HANDLE LIQUID PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS WITH THE POTENTIAL TO CONTAMINATE GROUNDWATER IN AREAS OF THE PROJECT SITES DRAINING TO AN INFILTRATION AREA OR WITHIN 100 FEET OF A CRITICAL RESOURCE AREA OR STREAM, DIKES, BERMS, SLUMPS, AND OTHERS OF SECONDARY CONTAINMENT THAT PREVENT DISCHARGE TO GROUNDWATER. MAY BE USED TO ISOLATE PORTIONS OF THE SITE FOR THE PURPOSES OF STORING AND HANDLING LIQUID HAZARDOUS MATERIALS.
3. **FUGITIVE SEDIMENT AND DUST:** CONTRACTOR SHALL TAKE ALL NECESSARY ACTIONS TO ENSURE THAT ACTIVITIES DO NOT RESULT IN NOTICEABLE EROSION OF SOILS OR FUGITIVE DUST EMISSIONS DURING OR AFTER CONSTRUCTION. OPERATIONS DURING DRY MONTHS, THAT EXPERIENCE FUGITIVE DUST PROBLEMS, SHOULD WET DOWN UNPAVED ACCESS ROADS ONCE A WEEK OR MORE FREQUENTLY AS NEEDED WITH A WATER ADDITIVE. OIL MAY NOT BE USED FOR DUST CONTROL. CONTRACTOR SHALL MONITOR VEHICLES ENTERING AND EXITING THE PROJECT SITE FOR EVIDENCE OF TRACKING MUD ONTO PUBLIC OR PRIVATE ROADWAYS OUTSIDE THE WORK AREA. IF NECESSARY, CONTRACTOR SHALL PROVIDE MEANS FOR SWEEPING AND CLEANING ROAD AREAS EXPERIENCING TRACKING. IF OFF-SITE TRACKING OCCURS ON PUBLIC ROADS, THEY SHOULD BE SWEEP IMMEDIATELY AND NO LESS THAN ONCE A WEEK AND PRIOR TO SIGNIFICANT STORM EVENTS. DURING THE MUD SEASON IT MAY BE NECESSARY TO INCREASE THE SIZE OF STABILIZED CONSTRUCTION ENTRANCES OR PROVIDE A WHEEL WASHING STATION.
4. **DEBRIS AND OTHER MATERIALS:** CONTRACTOR SHALL MANAGE ALL LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORMWATER TO PREVENT MATERIALS FROM BECOMING A SOURCE OF POLLUTION. CONTRACTOR SHALL MINIMIZE THE EXPOSURE OF CONSTRUCTION DEBRIS, BUILDING AND LANDSCAPING MATERIALS TO PRECIPITATION AND STORMWATER RUNOFF. THESE MATERIALS MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.
5. **TRENCH OR FOUNDATION DEWATERING:** TRENCH DEWATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, COFFER DAMS, PONDS, SUMPS, BASINS, AND OTHER AREAS WITHIN THE CONSTRUCTION AREA THAT RETAIN WATER AFTER EXCAVATION. IN MOST CASES THE COLLECTED WATER IS HEAVILY SILTED AND HINDERS CORRECT AND SAFE CONSTRUCTION PRACTICES. THE CONTRACTOR SHALL REMOVE COLLECTED WATER FROM THE PONDED AREAS, EITHER THROUGH GRAVITY OR PUMPING, IN A MANNER THAT SPREADS IT THROUGH NATURAL WOODED BUFFERS OR TO AREAS THAT ARE SPECIFICALLY DESIGNED TO COLLECT THE MAXIMUM AMOUNT OF SEDIMENT POSSIBLE (E.G. COFFERDAM SEDIMENT BASIN). THE CONTRACTOR SHALL AVOID PRACTICES THAT ALLOW SEDIMENT LADEN WATER FROM DEWATERING TO FLOW OVER DISTURBED AREAS OF THE PROJECT SITES. OTHER MEASURES OR METHODS MAY BE UTILIZED AS REVIEWED AND APPROVED BY THE ENGINEER AND, IF NECESSARY, THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION.
6. **AUTHORIZED NON-STORMWATER DISCHARGES:** THE CONTRACTOR SHALL IDENTIFY AND PREVENT CONTAMINATION BY NON-STORMWATER DISCHARGES. WHERE ALLOWED NON-STORMWATER DISCHARGES EXIST, THEY MUST BE IDENTIFIED AND STEPS SHALL BE TAKEN TO ENSURE IMPLEMENTATION OF APPROPRIATE POLLUTION PREVENTION MEASURES FOR THE NON-STORMWATER COMPONENTS OF THE DISCHARGE. AUTHORIZED NON-STORMWATER DISCHARGES ARE: DISCHARGES FROM FIREFIGHTING ACTIVITY, FIRE HYDRANT FLUSHING, VEHICLE WASHING IF DETERGENTS ARE NOT USED AND WASHING IS LIMITED TO THE EXTERIOR OF VEHICLES, DUST CONTROL RUNOFF IN ACCORDANCE WITH PERMIT CONDITIONS AND APPENDIX C(3) OF CHAPTER 500, ROUTINE EXTERNAL BUILDING WASHDOWN (EXCLUDING PAINT REMOVAL AND USE OF DETERGENTS), PAVEMENT WASHWATER (EXCLUDING AREAS OF SPILLS OR LEAKS OR TOXIC/HAZARDOUS MATERIALS AND USE OF DETERGENTS), UNCONTAMINATED AIR CONDITIONING OR COMPRESSOR CONDENSATE, UNCONTAMINATED GROUNDWATER OR SPRING WATER, FOUNDATION OR FOOTING DRAIN-WATER WHERE FLOWS ARE NOT CONTAMINATED, UNCONTAMINATED EXCAVATION DEWATERING PER APPENDIX C(5) OF CHAPTER 500, POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHING, AND LANDSCAPE IRRIGATION.
6. **UNAUTHORIZED NON-STORMWATER DISCHARGES:** THE CONTRACTOR SHALL IDENTIFY AND PREVENT CONTAMINATION BY UNAUTHORIZED NON-STORMWATER DISCHARGES. UNAUTHORIZED STORMWATER DISCHARGES INCLUDE, BUT ARE NOT LIMITED TO, WASTEWATER FROM CONCRETE WASHOUT, FUELS OR HAZARDOUS SUBSTANCES, AND DETERGENTS USED IN VEHICLE AND EQUIPMENT WASHING.
7. **ADDITIONAL REQUIREMENTS:** COMPLETION OF THE WORK WILL REQUIRE FREQUENT ACCESS TO VARIOUS PORTIONS OF THE PROJECT AREA FROM STATE AND LOCAL ROADWAYS. CONTRACTOR SHALL MONITOR PUBLIC ROADWAYS AND SHALL CLEAN PAVEMENT BY MEANS NECESSARY IN THE EVENT THAT SEDIMENT OR TRACKING IS OBSERVED. SIGNAGE SHALL BE POSTED AT INTERSECTIONS OF PROJECT ACCESS ROADS AND PUBLIC WAYS, STATING COMPANY NAME AND 24-HOUR CONTACT PHONE NUMBER.

LEGEND

	SUBJECT PROPERTY BOUNDARY
	APPROXIMATE ABUTTING PROPERTY BOUNDARY
	APPROXIMATE RIGHT-OF-WAY
	EXISTING UNPAVED ROAD
	EXISTING FENCE
	EXISTING WATERLINE
	EXISTING BUILDING
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	EXISTING SPOT ELEVATION
	EXISTING TREES AND/OR BRUSH
	DELINEATED WETLAND
	EXISTING POND
	DELINEATED STREAM
	NON-JURISDICTIONAL DRAINAGE
	LIMIT OF FEMA 100YR 24HR FLOOD ZONE
	EXISTING CULVERT
	EXISTING OVERHEAD ELECTRIC
	EXISTING UTILITY POLE
	LOD
	LIMITS OF DISTURBANCE
	PROPOSED CULVERT
	PROPOSED ACCESS ROAD
	PROPOSED MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED TREE LINE
	PROPOSED CHAIN LINK FENCE
	NRCS SOILS DATA
	SF
	PROPOSED SILT FENCE
	PROPOSED OVERHEAD ELECTRIC LINE AND POLE
	75' STREAM BUFFER
	25' STREAM BUFFER
	VEGETATED WATER QUALITY BUFFER

ZONING REQUIREMENTS

DIMENSIONAL STANDARDS							
DISTRICT	MIN. FRONT YARD SETBACK		MIN. SIDE YARD SETBACK		MIN. REAR YARD SETBACK		BUILDING MAX. HEIGHT
	REQUIRED	PROVIDED	REQUIRED	PROVIDED	REQUIRED	PROVIDED	
NONE	NA	118'	NA	27'	NA	83'	NA
							20'

SITE SPECIFIC SOILS TABLE

ID	NAME	SLOPE RANGE	TEXTURE	HYDROLOGIC SOIL GROUP
H1C	HARTLAND	8 - 15%	SANDY LOAM	B
H1D	HARTLAND	15 - 25%	SANDY LOAM	B
P1C2	PACTION-CHARLTON	8 - 15%	SANDY LOAM	C/D
R1A	RIDGEBURY	0 - 5%	SANDY LOAM	C/D
SKB	SCIO	3 - 8%	SANDY LOAM	C
SKC2	SCIO	8 - 15%	SANDY LOAM	C
WB	WOODBIDGE	3 - 8%	SANDY LOAM	C/D

PROJECT SCHEDULE

SPECIFICS OF HOW WORK IS TO BE COMPLETED SHALL ALSO BE BASED ON ENVIRONMENTAL CONSIDERATIONS ASSOCIATED WITH SEASONAL CHANGES. THE FOLLOWING DATES ARE PROVIDED TO ESTABLISH A GENERAL GUIDELINE FOR THESE SEASONS:

- WINTER: NOVEMBER 1 TO MARCH 19
- MUD SEASON: MARCH 20 TO APRIL 30
- SPRING: MAY 1 TO JUNE 21
- SUMMER: JUNE 22 TO SEPTEMBER 21
- FALL: SEPTEMBER 22 TO OCTOBER 31

FERTILIZER AND LIMESTONE REQUIREMENTS

IN GENERAL, FERTILIZER AND LIME APPLICATION RATES WILL FOLLOW THE GUIDELINES IDENTIFIED BELOW UNLESS SITE SPECIFIC SOIL TESTS IDENTIFY THE NEED FOR ALTERNATIVE FERTILIZER/LIME APPLICATION RATES. FERTILIZER WILL BE APPLIED TO UPLAND AREAS PRIOR TO SEEDING AT A RATE OF 800 POUNDS PER ACRE USING 10-0-0 (N-P205-K20) OR EQUIVALENT. GROUND LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) WILL BE APPLIED AT A RATE OF 3 TONS PER ACRE. AN EQUIVALENT MIXTURE OF FERTILIZER AND LIME MAY BE APPLIED USING THE HYDROSEEDING METHOD. NO LIME OR FERTILIZER WILL BE APPLIED TO WETLANDS.

MULCH ANCHORING REQUIREMENTS

ON SLOPES GREATER THAN 3 PERCENT, STRAW MULCH WILL BE FIRMLY ANCHORED INTO THE SOIL UTILIZING ONE OF THE FOLLOWING METHODS:

- CRIMPING WITH A STRAIGHT OR NOTCHED MULCH CRIMPING TOOL (FARM DISCS WILL NOT BE ALLOWED);
- TRACK WALKING WITH DEEP-CLEATED EQUIPMENT OPERATING UP AND DOWN THE SLOPE (MULCH CRIMPED PERPENDICULAR TO THE SLOPE) ON SLOPES >25 PERCENT;
- APPLICATION OF MULCH NETTING;
- APPLICATION OF 500 LB./ACRE OF WOOD FIBER MULCH OVER STRAW/HAY MULCH; AND
- COMMERCIALY AVAILABLE TACKIFIERS (EXCEPT WITHIN 100 FEET OF WATERBODIES OR WETLANDS).

PHOSPHORUS CONTROL PLAN NOTES

LAKE WATERSHED, MESSALONSKEE LAKE
WATERSHED PER ACRE PHOSPHORUS BUDGET: 0.068 LBS P/ACRE/YEAR
PROJECT PHOSPHORUS BUDGET: 1.646 LBS P/ACRE/YEAR
PROJECT PHOSPHORUS EXPORT: 0.589 LBS P/YEAR

SEED AND MULCH SPECIFICATIONS

SEED MIX SPECIFICATIONS		
SEED MIX NAME ¹	SEED MIX COMPONENTS	LB./ACRE ¹
TEMPORARY SEED MIX	ANNUAL RYEGRASS	40
PERMANENT SEED MIXES		
UPLANDS	NEW ENGLAND LOGGING ROAD MIX (OR APPROVED EQUAL)	20
WOODCHIP APPLICATION SEED MIX	NEW ENGLAND LOGGING ROAD MIX (OR APPROVED EQUAL)	20
SUPPLEMENTAL WINTER SEED MIX ²	WINTER RYEGRASS	120

NOTES:
1. INCREASE SEEDING RATES 10% WHEN HYDROSEEDING
2. WINTER RYE WILL BE ADDED TO CONSERVATION MIX AT A RATE OF 120 LB./ACRE BETWEEN OCTOBER 1 AND APRIL 15
3. PERMANENT SEED MIXES TO CONSIST OF NATIVE GRASSES, RUSHES, FORBS, AND WILDFLOWERS

SUMMARY OF TEMPORARY AND PERMANENT MULCH APPLICATION REQUIREMENTS			
CONDITION	TIMING	MULCH TYPE ²	APPLICATION RATES
TEMPORARY			
INACTIVE AREAS	IF NO ACTIVITY IN EXPOSED AREAS FOR 7 DAYS, OR PRIOR TO A STORM EVENT	STRAW MULCH OR WOOD FIBER MULCH OR EROSION CONTROL MIX	2 TONS/ACRE 1 TON/ACRE 2" THICK OVER AREA
ALL DISTURBED AREAS OF THE CONSTRUCTION WORKSPACE	APPLY MULCH TO ALL EXPOSED AREAS IF NO ACTIVITY OCCURS WITHIN 30 DAYS. APPLY MULCH AND TEMPORARY SEEDING SOONER WHEN IT CAN BE ANTICIPATED THAT ACTIVITY IS NOT GOING TO OCCUR WITHIN 30 DAYS.	STRAW MULCH OR WOOD FIBER MULCH	2 TONS/ACRE 1 TON/ACRE ³
ALL WORK AREAS EXPOSED ARE TO BE MULCHED DAILY EACH TIME SOIL IS DISTURBED ²	NOVEMBER 1 - APRIL 15	STRAW MULCH OR WOOD FIBER MULCH	4 TONS/ACRE 2 TONS/ACRE
PERMANENT			
ON ALL EXPOSED AREAS AFTER SEEDING TO STABILIZE THE SOIL SURFACE	PERMANENT GRASS AND/OR LEGUME SEEDING COVERED BY STRAW MULCH ON ALL AREAS THAT HAVE BEEN RESTORED TO FINAL GRADE. THIS DOES NOT APPLY TO AREAS STABILIZED BY OTHER MEANS SUCH AS JUTE MATTING OR PERMANENT EROSION CONTROL MIX.	CRIMPED STRAW MULCH OR PAPER MULCH OR WOOD FIBER MULCH	2 TONS/ACRE 1500 LB./ACRE ⁴ 1 TON/ACRE
WOOD CHIP APPLICATION AREAS ⁵	PERMANENT GRASS AND/OR LEGUME SEEDING COVERED BY STRAW MULCH ON ALL AREAS THAT HAVE BEEN RESTORED TO FINAL GRADE. THIS DOES NOT APPLY TO AREAS STABILIZED BY OTHER MEANS SUCH AS JUTE MATTING OR PERMANENT EROSION CONTROL MIX.	CRIMPED STRAW MULCH OR PAPER MULCH OR WOOD FIBER MULCH	2 TONS/ACRE 1500 LB./ACRE ⁴ 1 TON/ACRE

NOTES:
1. IN ALL CASES, SUFFICIENT MULCH SHALL BE APPLIED SUCH THAT NO SOIL IS VISIBLE THROUGH THE MULCH.
2. DOUBLE RATE OF WOOD FIBER MULCH WHEN USED IN OR ADJACENT TO CRITICAL AREAS. INCREASE MULCH RATE BY HALF UNDER SOLAR ARRAY DRIP EDGE.
3. STRAW, HAY, OR HYDROMULCH (WOOD FIBER OR PAPER MULCH AS APPROPRIATE) SHALL PROVIDE MINIMUM 90 PERCENT GROUND COVERAGE.
4. PAPER MULCH IS ACCEPTABLE FOR USE DURING THE GROWING SEASON. ON SLOPES >30 PERCENT AND IN AREAS WHERE VEGETATION HAS NOT ESTABLISHED WELL, ADDITIONAL HAY MULCH WILL BE ADDED AS A WINTERIZING MEASURE.
5. MULCH MAY NOT BE SPREAD ON TOP OF SNOW.
6. WOODCHIPS SHALL BE APPLIED AT A MAXIMUM THICKNESS OF 4-INCHES AND ONLY IN UPLAND AREAS.

SUMMARY OF SEEDING REQUIREMENTS		
CONDITION	TIMING ^{2,3}	SEED MIX
TEMPORARY SEEDING ²	TEMPORARY SEED BETWEEN APRIL 15 AND OCTOBER 1 ONLY. DISTURBED AREAS OR SOIL STOCKPILES WILL BE SEED IMMEDIATELY IF FURTHER DISTURBANCE IS NOT EXPECTED FOR 30 DAYS OR MORE.	ANNUAL RYEGRASS
PERMANENT SEEDING ^{3,4}		
UPLAND PORTIONS OF THE CONSTRUCTION AREA	DISTURBED AREA WILL BE SEEDED WITHIN 7 DAYS OF FINAL GRADING.	UPLAND MIX
SLOPES > 3:1	DISTURBED AREA WILL BE SEEDED IMMEDIATELY AFTER SEEDBED PREPARATION.	UPLAND MIX
AS DIRECTED	DISTURBED AREAS DESIGNATED FOR STABILIZATION WITH THE POLLINATOR MIX SHALL BE SEEDED WITHIN 7 DAYS OF FINAL GRADING.	POLLINATOR SEED MIX
WOODCHIP APPLICATION AREAS	DISTURBED AREA WILL BE SEEDED WITHIN 7 DAYS OF FINAL GRADING.	WOODCHIP APPLICATION SEED MIX
WINTER DORMANT SEEDING	DORMANT SEED BETWEEN OCTOBER 1 AND APRIL 15 ONLY. NO SEEDING WILL OCCUR IF SNOW DEPTHS EXCEED 1 INCH.	CONSERVATION MIX PLUS WINTER RYEGRASS

NOTES:
1. WEATHER CONDITIONS PERMITTING.
2. AREAS THAT DO NOT SUCCESSFULLY REVEGETATE WITHIN APPROPRIATE PERIOD OF TIME WILL BE RESEED AS NECESSARY.
3. LOOSEN COMPACTED SOIL TO A MINIMUM DEPTH OF 4 INCHES.
4. TOP DRESS WITH 4 to 6 INCHES LOAM, AS NEEDED.

PERMITTING
NOT FOR CONSTRUCTION



SEAL:

PROFESSIONAL ENGINEER:

THOMAS N. DANIELS, JR.

DATE: JUNE 16, 2020

PROJECT: SOLAR FIELDS LLC
PROPOSED 2MW SOLAR ARRAY
242 MANCHESTER RD, BELGRADE, MAINE

TITLE: GENERAL NOTES & LEGEND

DRAWN BY: TRC/ARD PROJ. NO.: 389694

CHECKED BY: TND

APPROVED BY: TND

DATE: MAY 2020

FILE NO.: 389694-G-SHEETS.dwg

14 Gabriel Drive
Augusta, ME 04330
Phone: 207.620.3800
www.trcsolutions.com

EROSION CONTROL NOTES

PROJECT DESCRIPTION

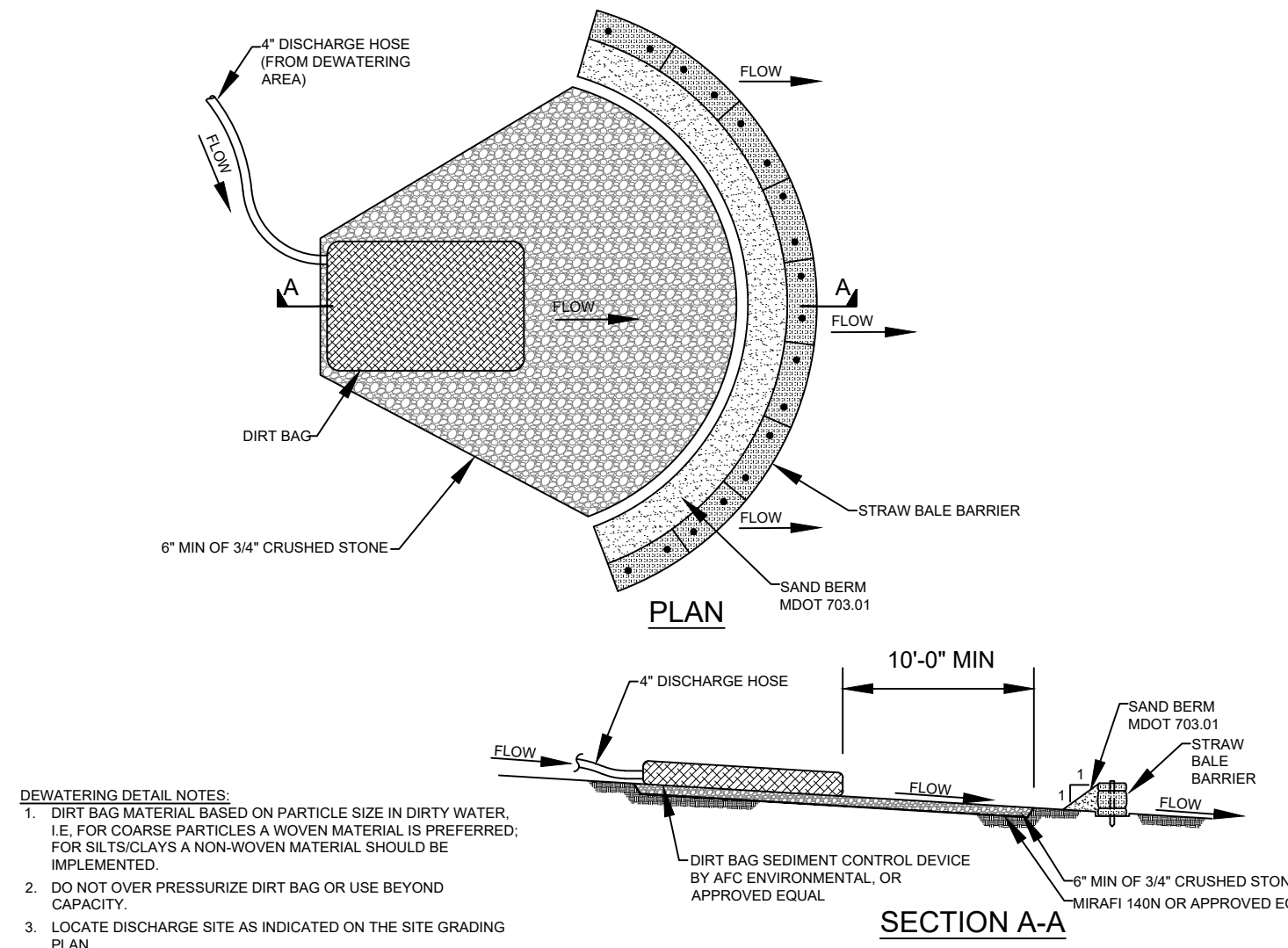
THE PROJECT INVOLVES THE CONSTRUCTION OF A GROUND-MOUNTED PHOTOVOLTAIC SOLAR MODULE SYSTEM AND ALL RELATED ACCESS ROADS, UTILITIES, SITE PREPARATION, CLEARING & GRUBBING, EROSION & SEDIMENTATION CONTROL MEASURES, AND TEMPORARY ACCESS ROADS.

CONSTRUCTION SEQUENCE

1. ALL CONTRACTORS ENGAGED IN SOIL DISTURBANCE SHALL BE CERTIFIED IN BASIC AND ADVANCED EROSION CONTROL PRACTICES BY MDEP UNLESS OTHERWISE APPROVED BY THE OWNER, ENGINEER, AND TOWN OF BELGRADE.
2. ESTABLISH CONSTRUCTION WORKSPACE LIMITS, IDENTIFY AND MARK SENSITIVE RECEPTORS INCLUDING NATURAL RESOURCES AND DOWNGRADIENT DRAINAGE INFRASTRUCTURE.
3. INSTALLATION OF ALL EROSION AND SEDIMENT CONTROL MEASURES AND ASSOCIATED WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE "MAINE EROSION AND SEDIMENT CONTROL PRACTICES FIELD GUIDE FOR CONTRACTORS" (REVISED 2014).
4. PRIOR TO USAGE, CONSTRUCT AND STABILIZE THE CONSTRUCTION ENTRANCE IN THE LOCATIONS INDICATED ON THE EROSION CONTROL PLAN SHEET.
5. CLEAR TIMBER, BRUSH, AND COMPLETE TREE REMOVAL, GRUBBING SHALL NOT BE COMPLETED UNTIL JUST PRIOR TO PRELIMINARY GRADING AND ESTABLISHMENT AND STABILIZATION OF TEMPORARY OR PERMANENT DRAINAGE CONVEYANCES.
6. INSTALL AND MAINTAIN PERIMETER LIMIT BARRIERS SUCH AS SILT FENCING OR OTHER APPROVED EROSION CONTROL BARRIERS ALONG THE DOWNHILL LIMIT OF DISTURBANCE AS SHOWN ON THE DRAWINGS. SEDIMENT BARRIER LOCATIONS MAY BE ADJUSTED IN THE FIELD BASED ON ACTUAL SITE CONDITIONS AS DEEMED NECESSARY TO ENSURE PROPER FUNCTION. WHERE SILT FENCE CANNOT BE TOED-IN PROPERLY DUE TO TREE ROOTS, ROCKS, OR FROZEN GROUND, HAY BALES OR AN EROSION CONTROL MIX BERM MAY BE SUBSTITUTED. PERIMETER SEDIMENT BARRIERS SHALL BE INSTALLED AS SOON AS POSSIBLE BUT MAY FOLLOW INITIAL SITE PREPARATION, EROSION OR SEDIMENTATION ISSUES DEVELOPING DURING INITIAL SITE PREPARATION SHALL BE TEMPORARILY STABILIZED AS NECESSARY.
7. STABILIZE PERMANENT ACCESS ROAD SURFACES, PARKING AREAS, AND EQUIPMENT STORAGE AND LAYDOWN AREAS WITH MATTING, CRUSHED STONE, OR GRAVEL SUBBASE AS NECESSARY TO MINIMIZE RUTTING AND AVOID PONDING OF STORMWATER.
8. CONCURRENT WITH INITIATION OF SITE GRADING, CONSTRUCT AND STABILIZE TEMPORARY DRAINAGE SWALES, DIVERSION BERMS, CHECK DAMS, AND CULVERTS WITH TEMPORARY INLET AND OUTLET PROTECTION TO MINIMIZE SEDIMENT IN SITE RUNOFF DURING CONSTRUCTION. DEWATERING SHALL BE IN ACCORDANCE WITH THE DEWATERING NOTES.
9. INSTALL PROPERLY SPACED STONE CHECK DAMS IN ANY SECTION OF DITCH WITHIN 24-HOURS OF FORMING, SHAPING, OR ROUGH GRADING THAT SECTION DITCH.
10. MINIMIZE THE AMOUNT OF DISTURBANCE AT ANY ONE TIME BY STAGING CONSTRUCTION AS MUCH AS PRACTICAL FOR EFFICIENT CONSTRUCTION OF THE FACILITY. NATURAL VEGETATIVE BUFFERS SHOULD BE LEFT IN PLACE WHERE FEASIBLE TO AID IN SEDIMENT RETENTION AND REDUCE THE POTENTIAL FOR EROSION.
11. STABILIZE ANY NEWLY GRADED SLOPE GREATER THAN EIGHT PERCENT AND ANY SECTION OF NEWLY CONSTRUCTED DITCH USING ANCHORED EROSION CONTROL BLANKETS OR OTHER APPROVED MULCHING TECHNIQUES WITHIN 24-HOURS. ALL VEGETATED DITCHES THAT HAVE NOT BEEN STABILIZED BY NOVEMBER 1, OR WILL BE WORKED ON BETWEEN NOVEMBER 1 AND APRIL 15, MUST BE STABILIZED WITH STONE LINING BACKED BY GRAVEL BED OR GEOTEXTILE AS SPECIFIED BY THE ENGINEER.
12. DUST CONTROL METHODS SHALL BE EMPLOYED AFTER GRADING AND PRIOR TO FINAL STABILIZATION TO PREVENT THE BLOWING AND MOVEMENT OF NUISANCE DUST THROUGH THE APPLICATION OF WATER AND/OR CALCIUM CHLORIDE.
13. APPLY TEMPORARY SEED AND MULCH TO EXPOSED AREAS WHERE ACTIVITY IS NOT ANTICIPATED FOR 30-DAYS/ TEMPORARILY MULCH ANY EXPOSED AREAS WITHIN 100-FEET OF A WETLAND OR NATURAL RESOURCE WHERE WORK IS NOT ANTICIPATED OR HAS NOT OCCURRED IN 7 DAYS.
14. REMOVE EXCESS SPOILS FROM THE SITE THAT WILL NOT BE USED FOR THE FINAL DESIGN AND STABILIZATION. STOCKPILED SOILS THAT REMAIN IN PLACE FOR 48-HOURS OR MORE SHALL BE CONTAINED WITH SEDIMENT BARRIERS. THE SEDIMENT BARRIERS SHALL BE REINFORCED TO HANDLE A SIGNIFICANT RAIN EVENT AND THE POTENTIAL SLUMPING OF THE PILE. BETWEEN APRIL 15 AND OCTOBER 1, APPLY TEMPORARY SEED AND MULCH TO A STOCKPILE THAT IS NOT ANTICIPATED TO BE DISTURBED WITHIN 30-DAYS. APPLY ANCHORED MULCH DAILY AND/OR AS NEEDED DURING WINTER CONSTRUCTION.
15. INSPECT AND REPAIR EROSION CONTROL MEASURES DAILY IN AREAS OF ACTIVE CONSTRUCTION; OTHERWISE WEEKLY AND AFTER A RAINFALL EVENT OF 0.5-INCHES OR GREATER WITHIN A 24-HOUR PERIOD. REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES 1/2 OF THE HEIGHT OF THE BARRIER.
16. MONITOR PUBLIC ROADS FOR SIGNS OF TRACKING OR SPILLING OF SPOIL MATERIAL AND CLEAN-UP AS NECESSARY.
17. COMPLETE FINAL GRADING AND STABILIZATION OF EARTHEN STRUCTURES SUCH AS DIVERSION BERMS, LEVEL SPREADERS, AND SWALES THAT WILL CONTROL POST-CONSTRUCTION RUNOFF.
18. FINISH GRADE AND REPLACE TOPSOIL OR LOAM IN DISTURBED AREAS. SEED AND MULCH DISTURBED AREAS WITHIN 6 DAYS OF FINAL GRADING. BETWEEN NOVEMBER 1 AND APRIL 15, STABILIZE AREAS THAT ARE FINAL GRADED AT THE END OF EACH DAY.
19. MAINTAIN ALL TEMPORARY EROSION CONTROLS AND SEDIMENT BARRIERS UNTIL VEGETATION HAS BEEN ESTABLISHED OVER 90% OF THE AREA TO BE REVEGETATED. RESEED SPARSELY VEGETATED AREAS AS NECESSARY.
20. REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES ONCE THE SITE IS PERMANENTLY STABILIZED.

DEWATERING NOTES

1. THE CONTRACTOR SHALL INSTALL, MAINTAIN, AND OPERATE ALL CHANNELS, SUMPS, AND ALL OTHER TEMPORARY DIVERSION AND PROTECTIVE WORKS NEEDED TO DIVERT STREAM FLOW AND OTHER SURFACE WATER THROUGH OR AROUND THE CONSTRUCTION SITE. CONTROL OF SURFACE WATER SHALL BE CONTINUOUS DURING THE PERIOD THAT DAMAGE TO CONSTRUCTION WORK COULD OCCUR.
2. OPEN EXCAVATIONS SHALL BE DEWATERED AND KEPT FREE OF STANDING WATER AND MUDDY CONDITIONS AS NECESSARY FOR THE PROPER EXCAVATION WORK. THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE, AND MAINTAIN ALL DRAINS, SUMPS AND ALL OTHER EQUIPMENT REQUIRED TO PROPERLY DEWATER THE SITE. DEWATERING SYSTEMS THAT CAUSE A LOSS OF SOIL FINES FROM THE FOUNDATION AREAS WILL NOT BE PERMITTED.
3. INSTALL DIVERSION DITCHES OR BERMS IF NECESSARY TO MINIMIZE THE AMOUNT OF CLEAN STORMWATER RUNOFF ALLOWED INTO THE EXCAVATION AREA.
4. REMOVAL OF WATER FROM THE CONSTRUCTION SITE SHALL BE ACCOMPLISHED SO THAT EROSION AND TRANSPORTATION OF SEDIMENT AND OTHER POLLUTANTS ARE MINIMIZED.
5. DISCHARGE DEWATERING EFFLUENT TO AREAS AS INDICATED ON THE SITE GRADING PLAN. DISCHARGE SHALL BE MANAGED TO ENSURE SHEET FLOW.
6. DEWATERING IN PERIODS OF INTENSE HEAVY RAIN OR WHEN THE INFILTRATIVE CAPACITY OF THE SOIL IS EXCEEDED, SHALL BE AVOIDED TO THE MAXIMUM EXTENT PRACTICABLE.
7. FLOW TO THE SEDIMENT REMOVAL STRUCTURE MAY NOT EXCEED THE STRUCTURE'S CAPACITY TO SETTLE AND FILTER FLOW OR THE STRUCTURE'S VOLUME CAPACITY.
8. WHEN TEMPORARY WORKS ARE NO LONGER NEEDED, THE CONTRACTOR SHALL REMOVE AND RETURN THE AREA TO A CONDITION SIMILAR TO THAT WHICH EXISTED BEFORE CONSTRUCTION. AREAS WHERE TEMPORARY WORKS WERE LOCATED SHALL BE GRADED FOR SIGHTLY APPEARANCE WITH NO OBSTRUCTION TO NATURAL SURFACE WATER FLOWS OR THE PROPER FUNCTIONING AND ACCESS TO THE WORKS OF IMPROVEMENTS INSTALLED. THE CONTRACTOR SHALL EXERCISE EXTREME CARE DURING THE REMOVAL STAGES TO MINIMIZE THE LOSS OF SOIL, SEDIMENT AND DEBRIS THAT WAS COLLECTED DURING CONSTRUCTION.



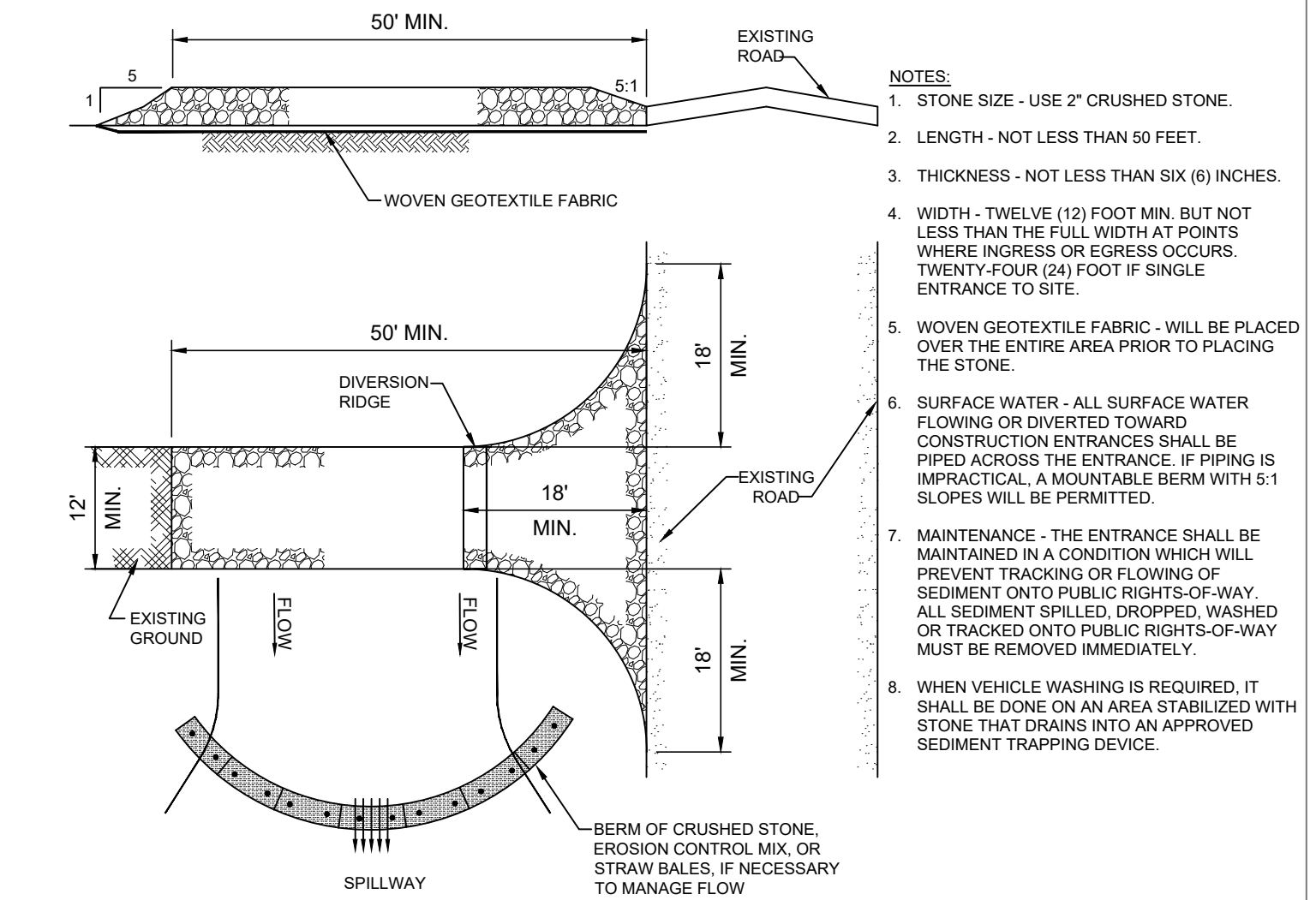
1. DIRT BAG MATERIAL, BASED ON PARTICLE SIZE IN DIRTY WATER, I.E. FOR COARSE PARTICLES A WOVEN MATERIAL IS PREFERRED. FOR SILT/CLAYS A NON-WOVEN MATERIAL SHOULD BE IMPLEMENTED.
2. DO NOT OVER PRESSURIZE DIRT BAG OR USE BEYOND CAPACITY.
3. LOCATE DISCHARGE SITE AS INDICATED ON THE SITE GRADING PLAN.
4. DOWNGRADIENT RECEIVING AREA MUST BE WELL VEGETATED OR OTHERWISE STABLE FROM EROSION, E.G. PERMANENT VEGETATION OR COARSE GRAVEL/STONE.
5. DISCHARGE OF DEWATERING ACTIVITIES PROHIBITED WITHIN 25' OF A NATURAL RESOURCE.

EXCAVATION DEWATERING DETAIL

NOT TO SCALE

CULVERT INLET/OUTLET PROTECTION

NOT TO SCALE



STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE

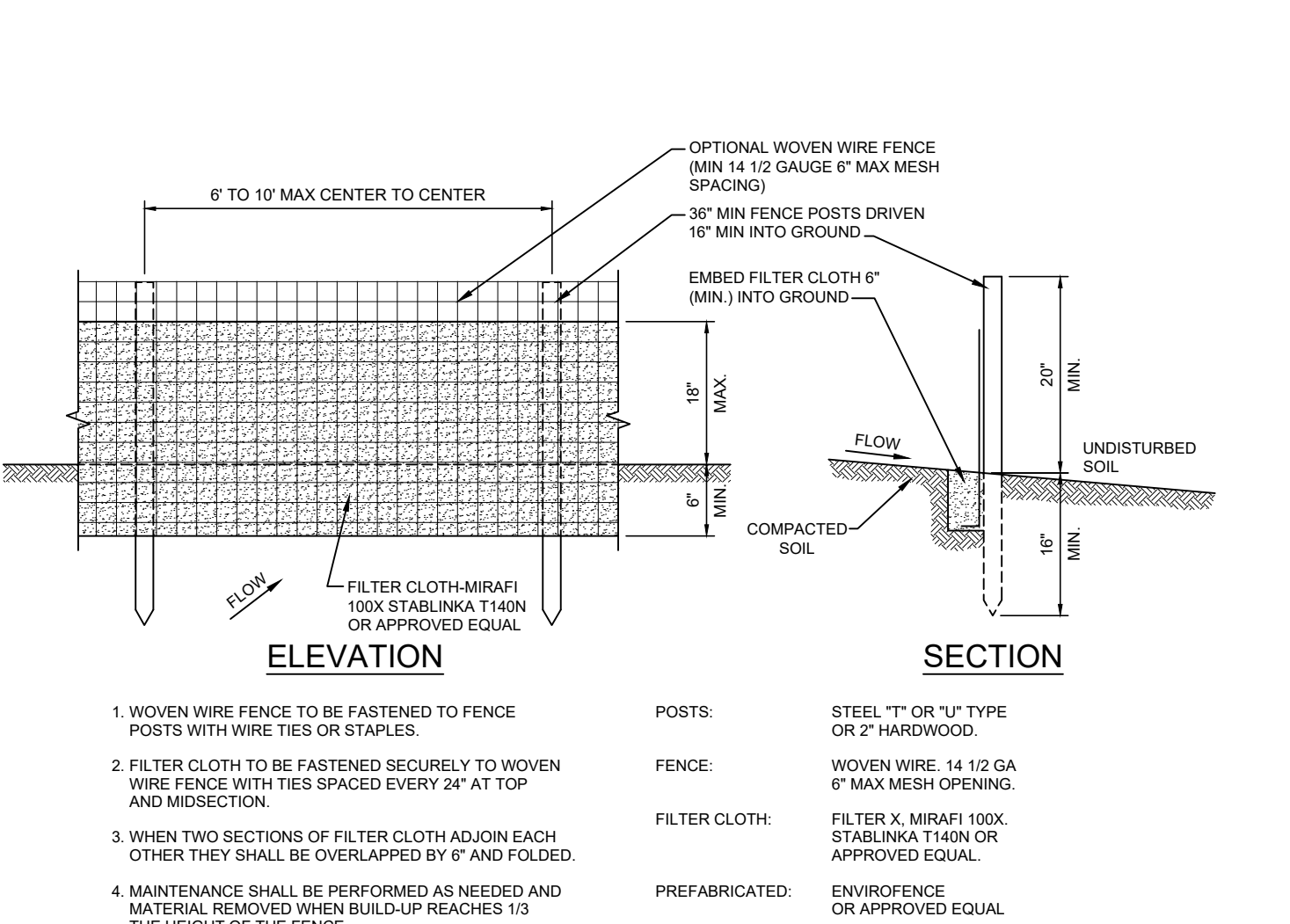
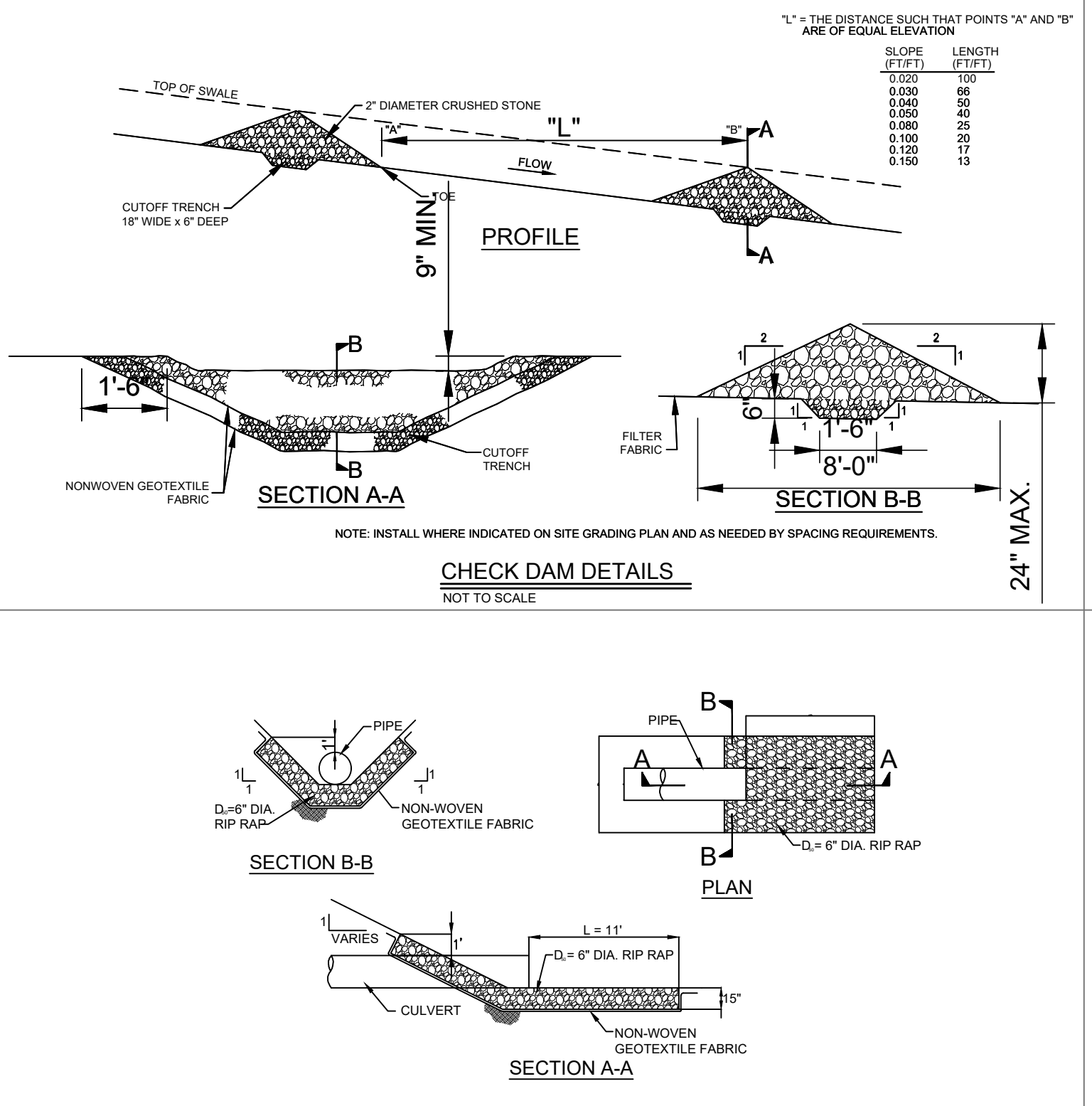
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELLO-SEED TO NOT SEED PREPARED AREA, CELLO-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
 2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 12" DEEP X 12" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
 3. ROLL THE BLANKETS (A) DOWN THE SLOPE. HORIZONTAL (B) INSTALLATION MAY BE APPROPRIATE IN SOME INSTANCES AS APPROVED BY THE ENGINEER. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO THE SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM, STAPLES/STAKES SHALL BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
 4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH A MINIMUM OF 4" 6" OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
 5. CONSECUTIVE BLANKETS SPICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 12" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.
- NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

EROSION CONTROL BLANKET

NOT TO SCALE

GRASS LINED DITCH

NOT TO SCALE



SILT FENCE DETAILS

NOT TO SCALE

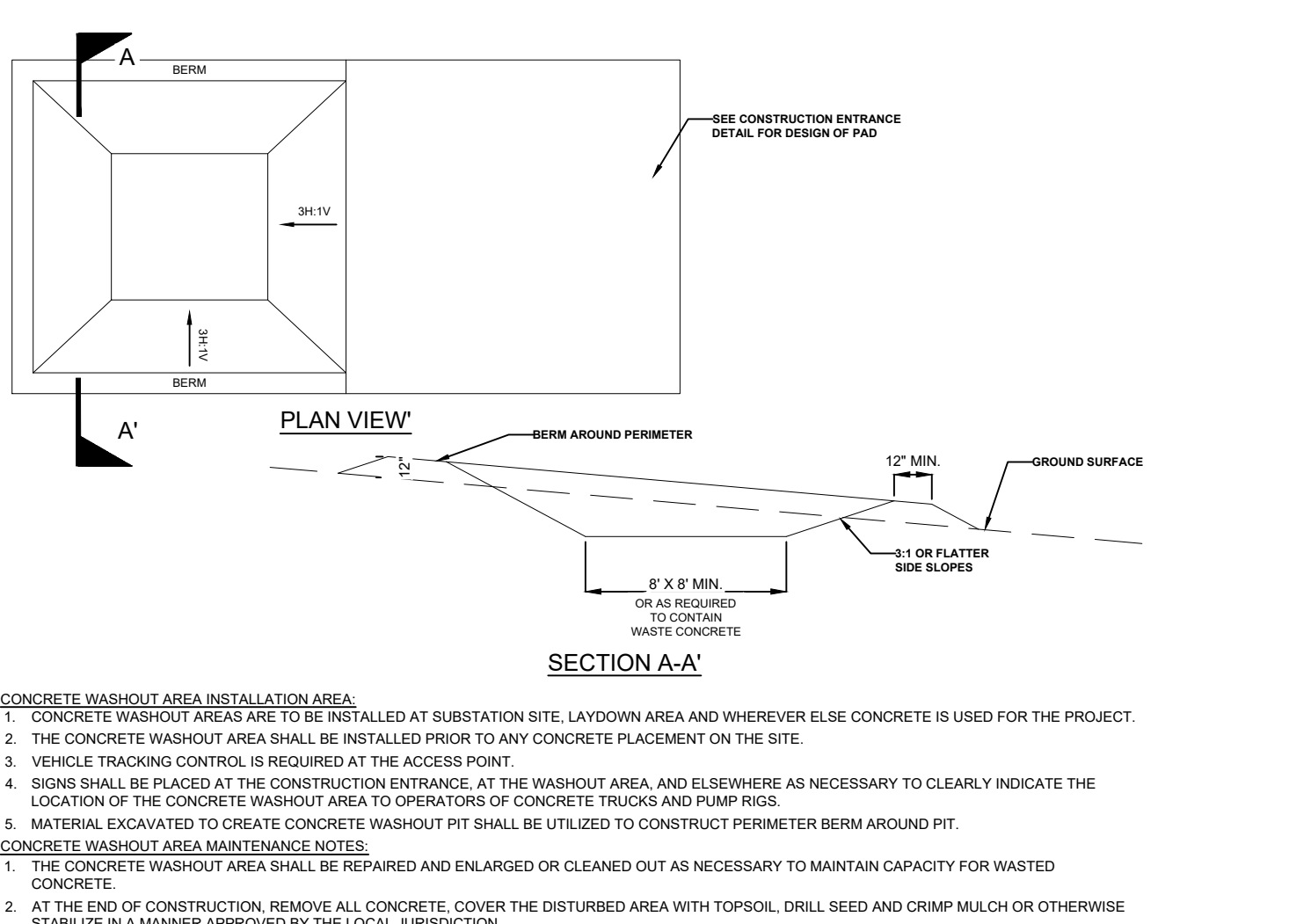
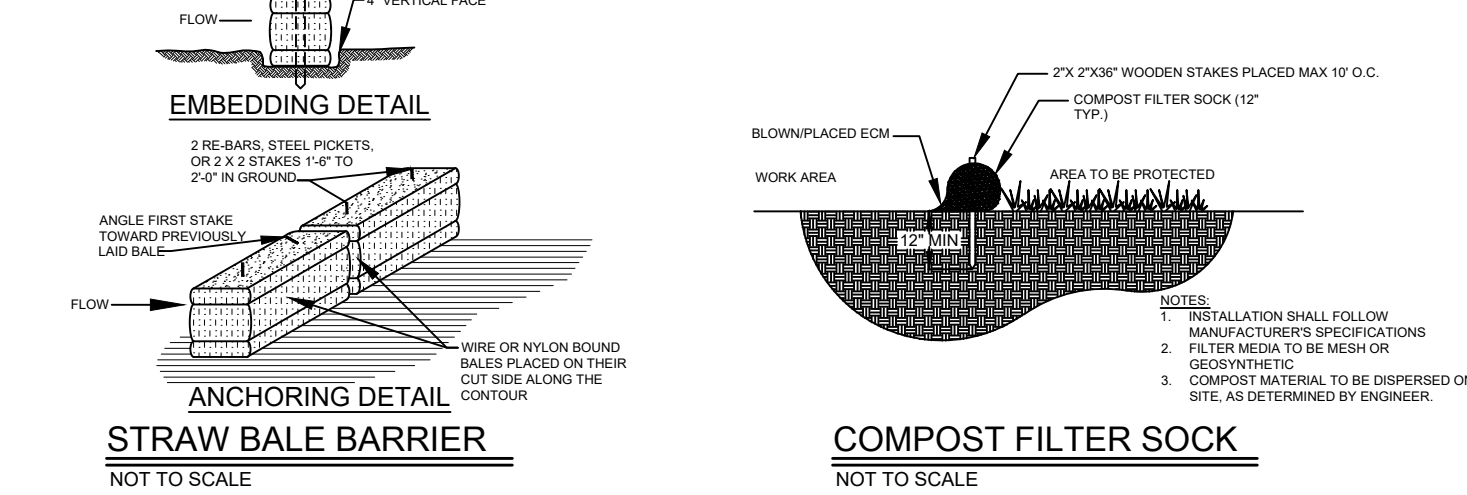
1. WOVEN WIRE FENCE TO BE FASTENED TO FENCE POSTS WITH WIRE TIES OR STAPLES.
 2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MIDSECTION.
 3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 6" AND FOLDED.
 4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN BUILD-UP REACHES 1/3 THE HEIGHT OF THE FENCE.
- POSTS: STEEL 1" OR 1 1/2" TYPE OR 2" HARDWOOD.
- FENCE: WOVEN WIRE 14 1/2 GA 6" MAX MESH OPENING.
- FILTER CLOTH: FILTER X, MIRAFI 100X, STABILINKA T140N OR APPROVED EQUAL.
- PREFABRICATED: ENVIROFENCE OR APPROVED EQUAL.

TYPICAL SOIL STOCKPILE

NOT TO SCALE

EROSION CONTROL BERM

NOT TO SCALE



CONCRETE WASHOUT AREA

NOT TO SCALE

1. CONCRETE WASHOUT AREAS ARE TO BE INSTALLED AT SUBSTATION SITE, LAYDOWN AREA AND WHEREVER ELSE CONCRETE IS USED FOR THE PROJECT.
2. THE CONCRETE WASHOUT AREA SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON THE SITE.
3. VEHICLE TRACKING CONTROL IS REQUIRED AT THE ACCESS POINT.
4. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE WASHOUT AREA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CONCRETE WASHOUT AREA TO OPERATORS OF CONCRETE TRUCKS AND PUMP TRUCKS.
5. MATERIAL EXCAVATED TO CREATE CONCRETE WASHOUT PIT SHALL BE UTILIZED TO CONSTRUCT PERIMETER BERM AROUND PIT.
6. THE CONCRETE WASHOUT AREA SHALL BE REPAIRED AND ENLARGED OR CLEANED OUT AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.
7. AT THE END OF CONSTRUCTION, REMOVE ALL CONCRETE, COVER THE DISTURBED AREA WITH TOPSOIL, DRILL SEED AND CRIMP MULCH OR OTHERWISE STABILIZE IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

PERMITTING

NOT FOR CONSTRUCTION

SEAL:		PROFESSIONAL ENGINEER:	
		THOMAS N. DANIELS, JR.	
DATE:		JUNE 16, 2020	
PROJECT: SOLAR FIELDS LLC PROPOSED 2MW SOLAR ARRAY 242 MANCHESTER RD, BELGRADE, MAINE			
TITLE: EROSION CONTROL NOTES & DETAILS			
DRAWN BY: TRC/ARD		PROJ. NO.: 389694	
CHECKED BY: TND		G-3	
APPROVED BY: TND			
DATE: MAY 2020			
FILE NO.:		389694-G-SHEETS.dwg	

2406 -- USER: Tndaniels -- ATTACHED: IMAGES: D:\cadd\hds\2020\0616
DRAWING NAME: R:\ENV RMD Projects\Solar Fields\389694 - Solar Fields Belgrade - Solar Fields Belgrade.ME\10-DWG\389694 - EXISTING_recover.dwg --- PLOT DATE: June 16, 2020 - 1:12PM --- LAYOUT: C-1



LEGEND

EXISTING SLOPE EXCEEDS 15%

SCALE IN FEET
0 60 120 180 240

PERMITTING
NOT FOR CONSTRUCTION

PROFESSIONAL ENGINEER:
THOMAS N. DANIELS, JR.
DATE:
JUNE 16, 2020

02	TRC	6/16/20	REVISED PER TOWN COMMENTS	TND
01	TRC	5/12/20	ISSUED FOR LOCAL PERMITTING	TND
NO.	BY	DATE	REVISION	APPD.

PROJECT:
**SOLAR FIELDS LLC
PROPOSED 2MW SOLAR ARRAY
242 MANCHESTER RD, BELGRADE, MAINE**

TITLE:
EXISTING CONDITIONS PLAN

DRAWN BY:	TRC	PROJ. NO.:	389694
CHECKED BY:	TND	C-1	
APPROVED BY:	TND		
DATE:	MAY 2020		

14 Gabriel Drive
Augusta, ME 04330
Phone: 207.620.3800
www.trcsolutions.com

FILE NO.: 389694 - EXISTING_recover.dwg

Home Multi Solutions

TALLMAX^{plus} THE FRAMED 72-CELL MODULE (1500V)

TSM-DE14A (II)

72 CELL MONOCRYSTALLINE MODULE

340-375W POWER OUTPUT RANGE

19.3% MAXIMUM EFFICIENCY

0/+5W POSITIVE POWER TOLERANCE

Founded in 1997, Trina Solar is the world's leading solar power company. We provide solar energy solutions for a wide range of applications. We have over 20 years of experience in the solar industry. We are committed to providing high-quality solar products and services to our customers. We are committed to providing high-quality solar products and services to our customers.

Comprehensive Product and System Certifications

ISO 9001:2015 Certified Quality Management System
ISO 14001:2015 Certified Environmental Management System
ISO 45001:2018 Certified Occupational Health and Safety Management System

Linear Performance Warranty

10 Year Product Warranty - 25 Year Linear Power Warranty

TALLMAX^{plus} TSM-DE14A (II)

Dimensions of PV Module (mm)

Electrical Data @ STC

	TSM-340	TSM-345	TSM-350	TSM-355	TSM-360	TSM-365	TSM-370
Peak Power (Watt)	340	345	350	355	360	365	370
Power Output Tolerance (Watt)	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5
Maximum Power Voltage (V _{mp})	38.3	38.5	38.8	39.0	39.3	39.5	40.0
Maximum Power Current (I _{mp})	9.10	9.06	9.04	9.04	9.00	8.97	8.97
Open Circuit Voltage (V _{oc})	46.2	46.7	47.0	47.4	47.7	48.0	48.3
Short Circuit Current (I _{sc})	9.90	9.85	9.80	9.80	9.75	9.68	9.68
Module Efficiency (%)	17.5	17.7	18.0	18.3	18.5	18.8	19.3

Electrical Data @ NOCT

	TSM-340	TSM-345	TSM-350	TSM-355	TSM-360	TSM-365	TSM-370
Maximum Power (Watt)	293	297	298	298	298	297	296
Maximum Power Voltage (V _{mp})	35.4	35.7	35.9	36.0	36.2	36.4	36.8
Maximum Power Current (I _{mp})	8.33	8.29	8.28	8.28	8.24	8.20	8.20
Open Circuit Voltage (V _{oc})	42.9	43.4	43.7	44.3	44.6	44.9	45.1
Short Circuit Current (I _{sc})	9.07	9.02	8.97	8.97	8.90	8.83	8.83

Mechanical Data

Solar Cells: Monocrystalline 156.75 x 156.75 mm

Cell Orientation: 72 cells (6x12)

Module Dimensions: 1950 x 910 x 40 mm

Weight: 26.5 kg with 6 mm glass; 20.5 kg with 2 mm glass

Glass: 6 mm tempered glass, 2 mm tempered glass

High transparency AR coated and heat tempered solar glass

Backsheet: White

Frame: Silver Anodized Aluminum Alloy

J-Box: IP67 or IP68 rated

Cables: Photovoltaic Technology Cable 4-core, 1200 mm

Connector: MC4 EVO2/UT54

Temperature Ratings

Normal Operating Temp: -40°C to +70°C

Temperature (NOCT): 45°C (NOCT)

Temperature Coefficient of P_{max}: -0.35%/°C

Temperature Coefficient of V_{oc}: -0.27%/°C

Temperature Coefficient of I_{sc}: 0.02%/°C

Warranty

10 Year Product Workmanship Warranty

25 Year Linear Performance Warranty

Packaging Configuration

Packaging Box: 1710 x 1710 x 1710 mm

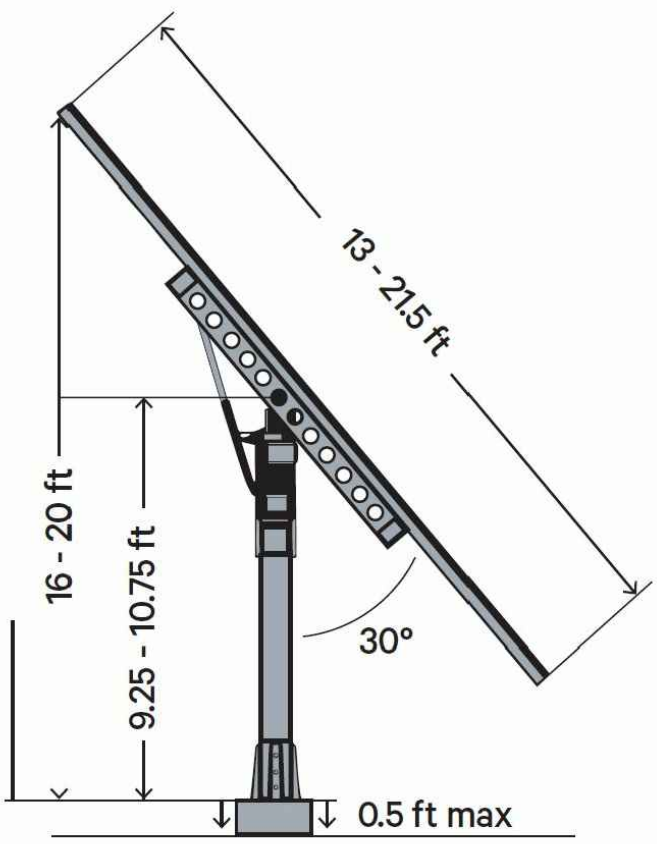
Modules per 40' container: 548 pieces



DUAL-AXIS TRACKER



FIXED TILT ARRAY



DUAL-AXIS TRACKER DETAIL

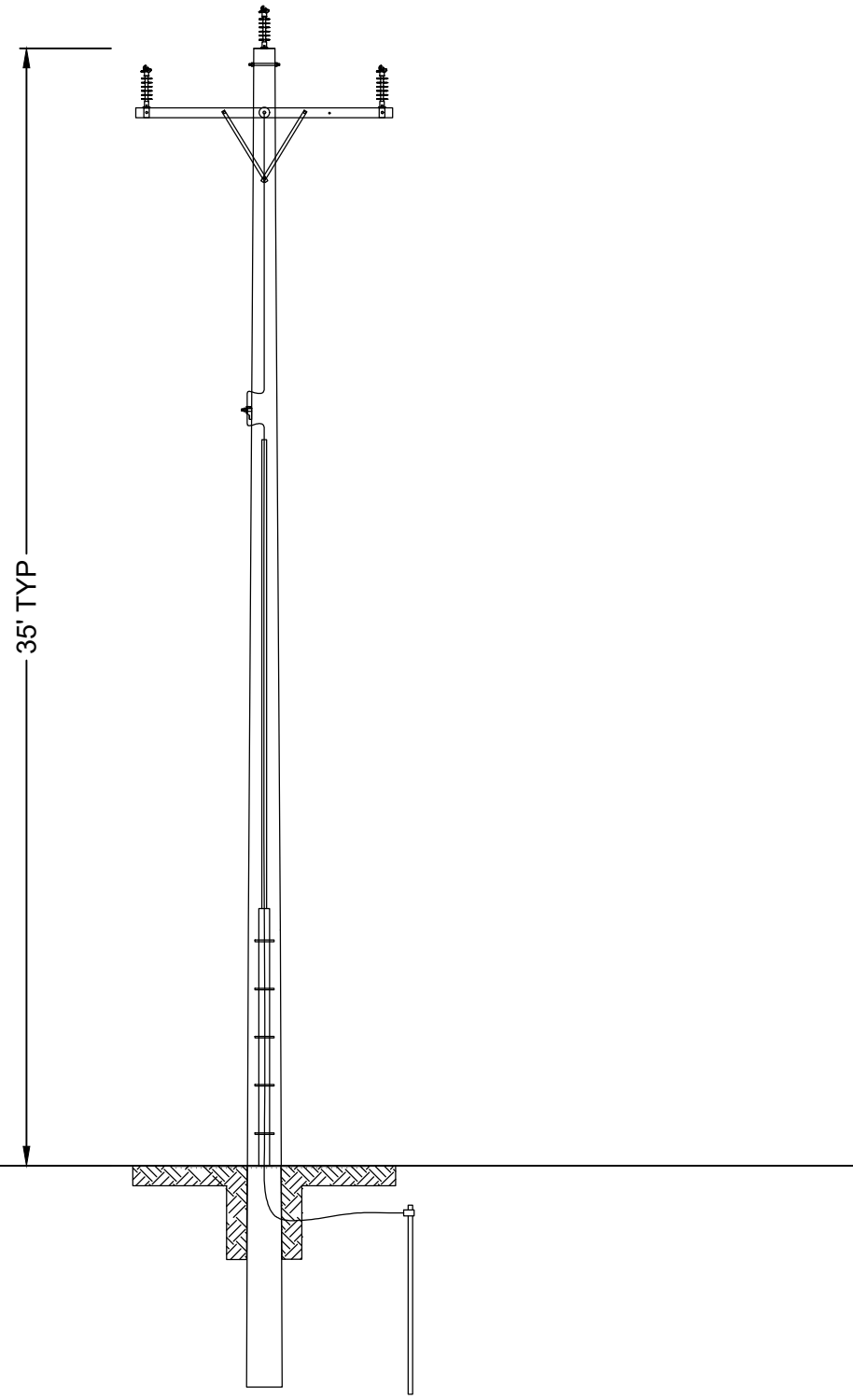
NOT TO SCALE

NOTES:

1. DETAIL PROVIDED BY ALLEARTH SOLAR OF WILLISTON, VT.

TYPICAL SOLAR ARRAY ISOMETRIC VISUALS

NOT TO SCALE

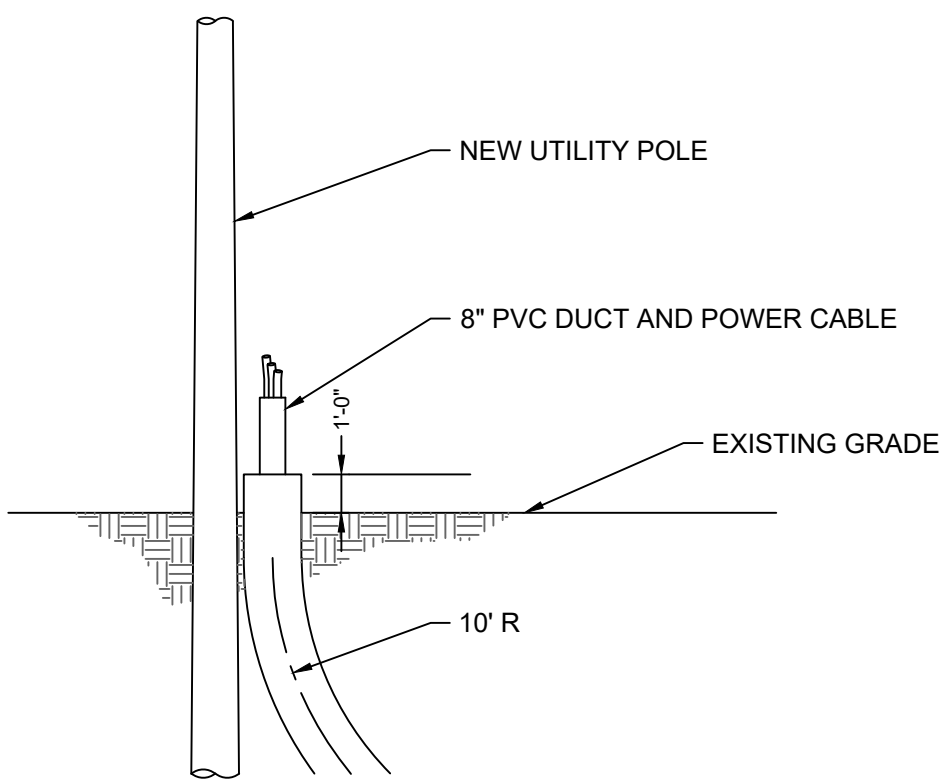


TYPICAL UTILITY POLE

NOT TO SCALE

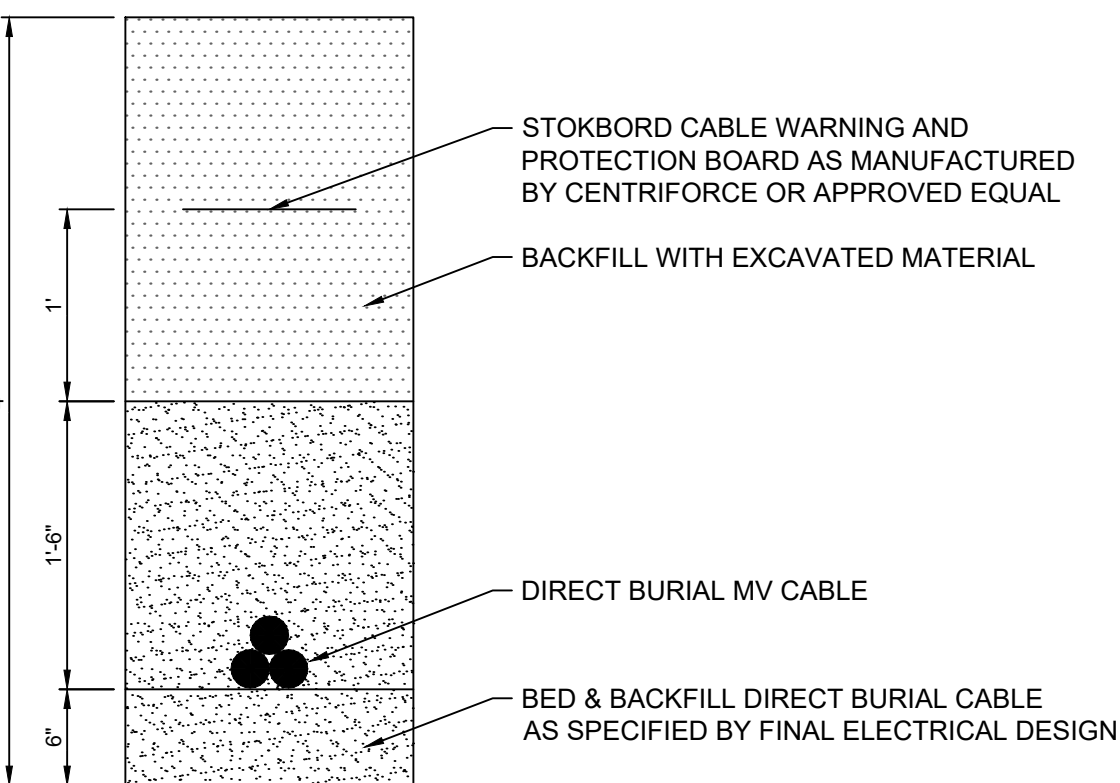
PV MODULE SPECIFICATION SHEET

NOT TO SCALE



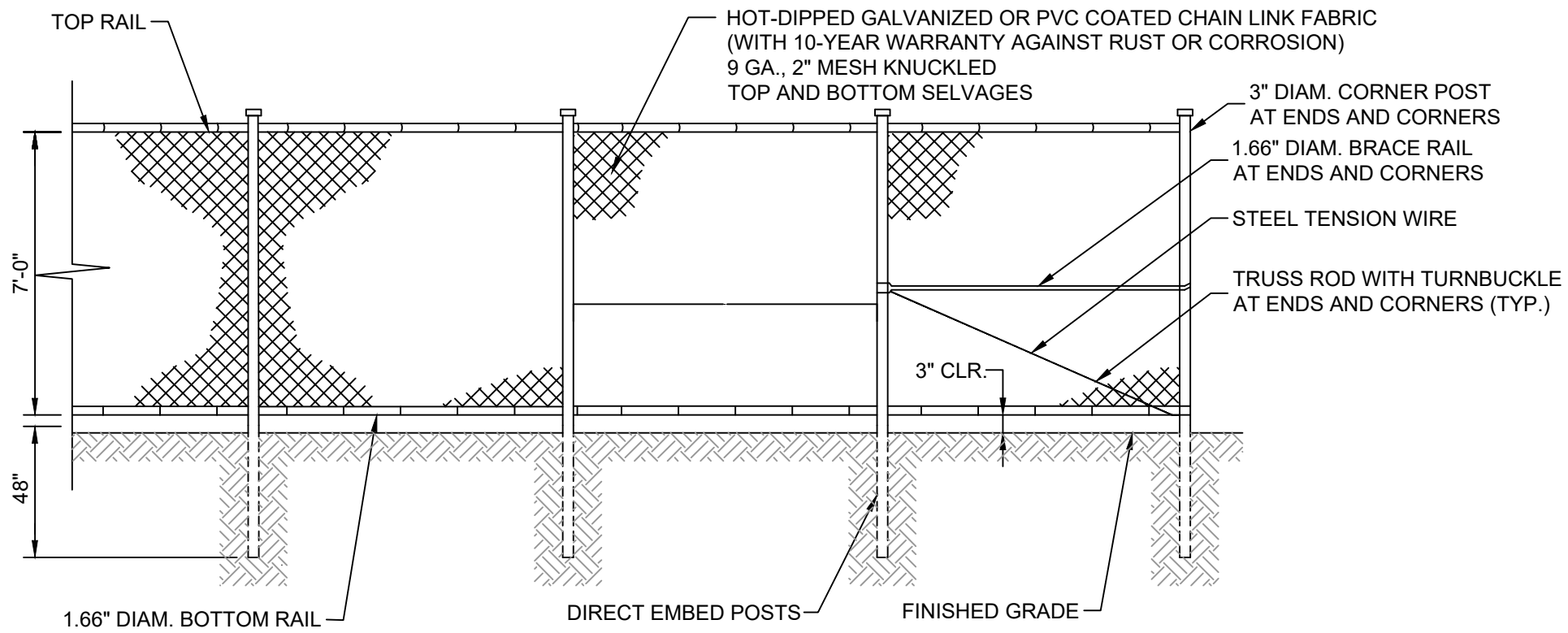
UNDERGROUND TO OVERHEAD TRANSITION DETAIL

NOT TO SCALE



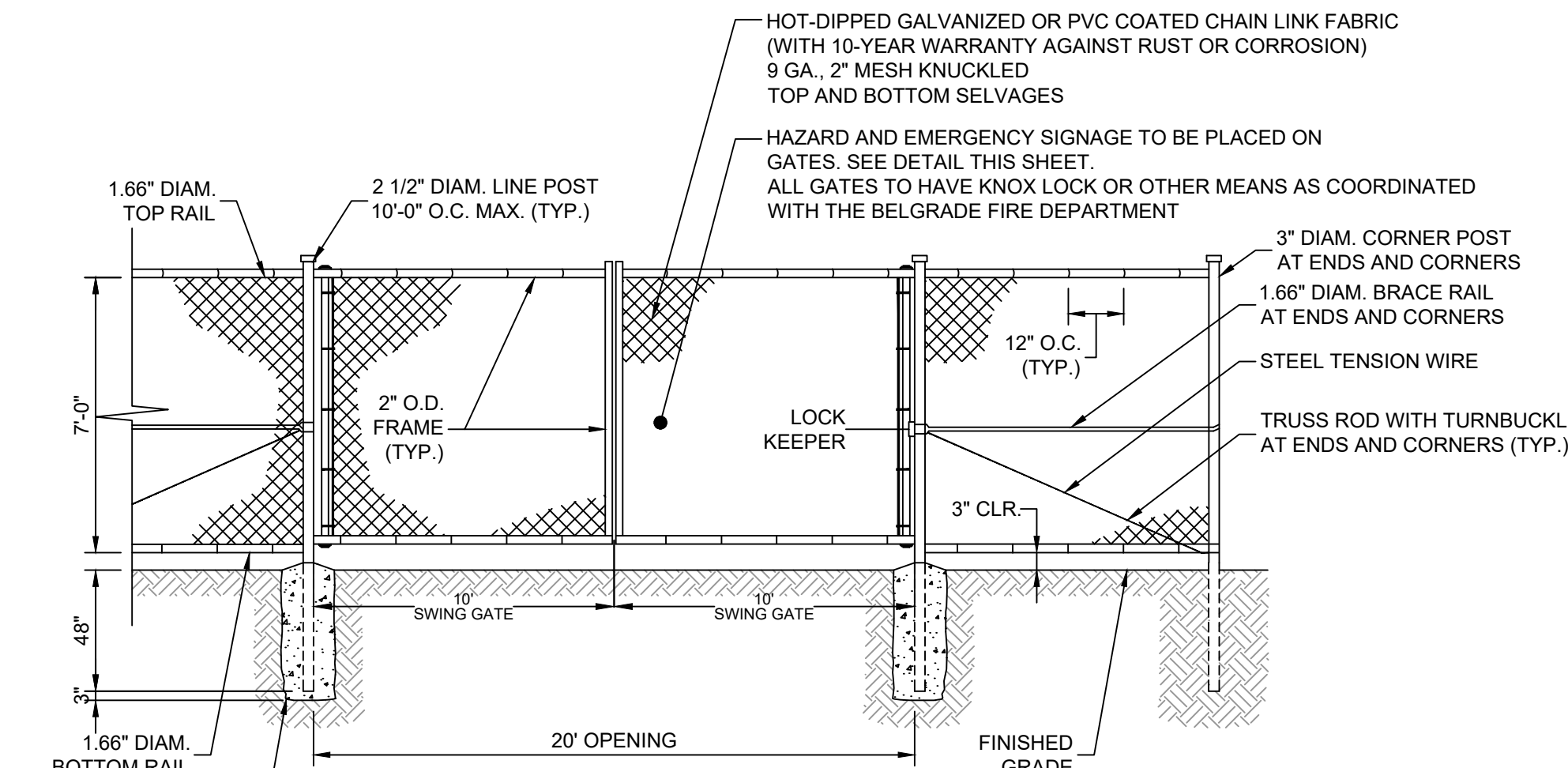
MV UNDERGROUND COLLECTION LINE DETAIL

NOT TO SCALE



POWER STATION FENCE DETAIL

NOT TO SCALE



POWER STATION VEHICULAR GATE DETAIL

NOT TO SCALE

NOTES

1. DETAILS THIS SHEET ARE FOR CONCEPTUAL AND ILLUSTRATIVE PURPOSES ONLY. FINAL LAYOUT AND CONFIGURATION IS SUBJECT TO DETAILED ENGINEERING DESIGN, INTERCONNECTION AGREEMENT, AND FINAL AHJ APPROVAL.
2. POLE DETAILS ARE DIAGRAMMATIC AND MAY BE CHANGED BASED ON SITE CONDITIONS AND UTILITY REQUIREMENTS.
3. FINAL EQUIPMENT CLEARANCES ARE SUBJECT TO AHJ APPROVAL AND NEC CODE COMPLIANCE.

PERMITTING

NOT FOR CONSTRUCTION



SEAL:

STATE OF MAINE
THOMAS N. DANIELS, JR.
Professional Engineer
LICENSED
2020-05-15

PROFESSIONAL ENGINEER:
THOMAS N. DANIELS, JR.

DATE:
JUNE 16, 2020

NO.	BY	DATE	REVISION	APPD.
02	TRC	6/16/20	REVISED PER TOWN COMMENTS	TND
01	TRC	5/12/20	ISSUED FOR LOCAL PERMITTING	TND

PROJECT:
**SOLAR FIELDS LLC
PROPOSED 2MW SOLAR ARRAY
242 MANCHESTER RD, BELGRADE, MAINE**

TITLE:
ELECTRICAL DETAILS

DRAWN BY: TRC PROJ. NO.: 389694

CHECKED BY: TND

APPROVED BY: TND

DATE: MAY 2020

C-4

DATE: MAY 2020

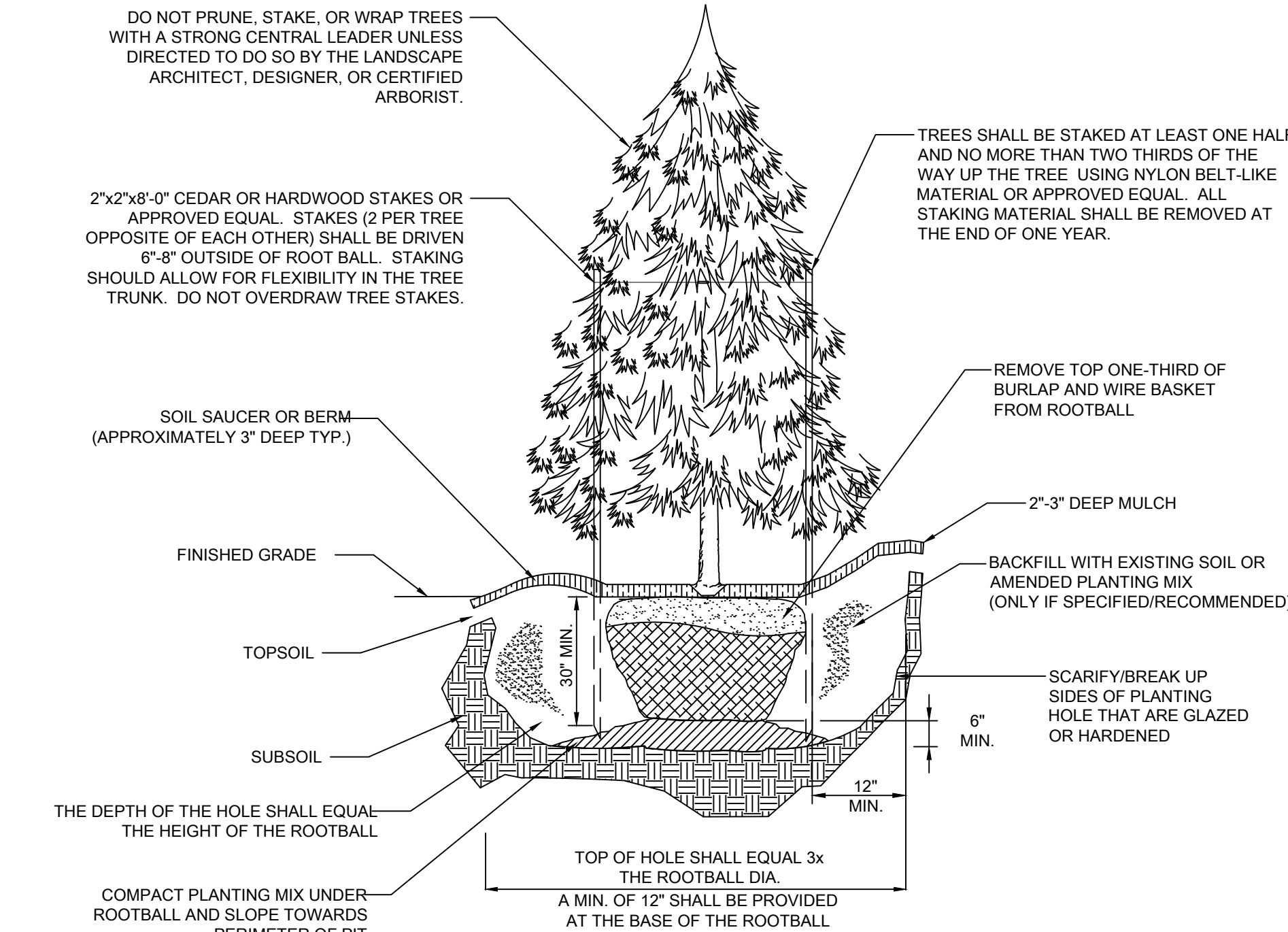
TRC

14 Gabriel Drive
Augusta, ME 04330
Phone: 207.620.3800
www.trcsolutions.com

FILE NO.: 389694 - DT.dwg

2436 --USER: T.Daniels -- ATTACHED REFERS -- ATTACHED IMAGES: Detail of the Solar Power Station on the array; Elevation; Meadow; 277769003; DigSafe; 10/20/200810; Tracker Detail; Tracker Image; DRAWING NAME: R:\ENV RMD Projects\Solar Fields\389694 - DT.dwg --- PLOT DATE: June 16, 2020 - 1:47PM --- LAYOUT: C-5

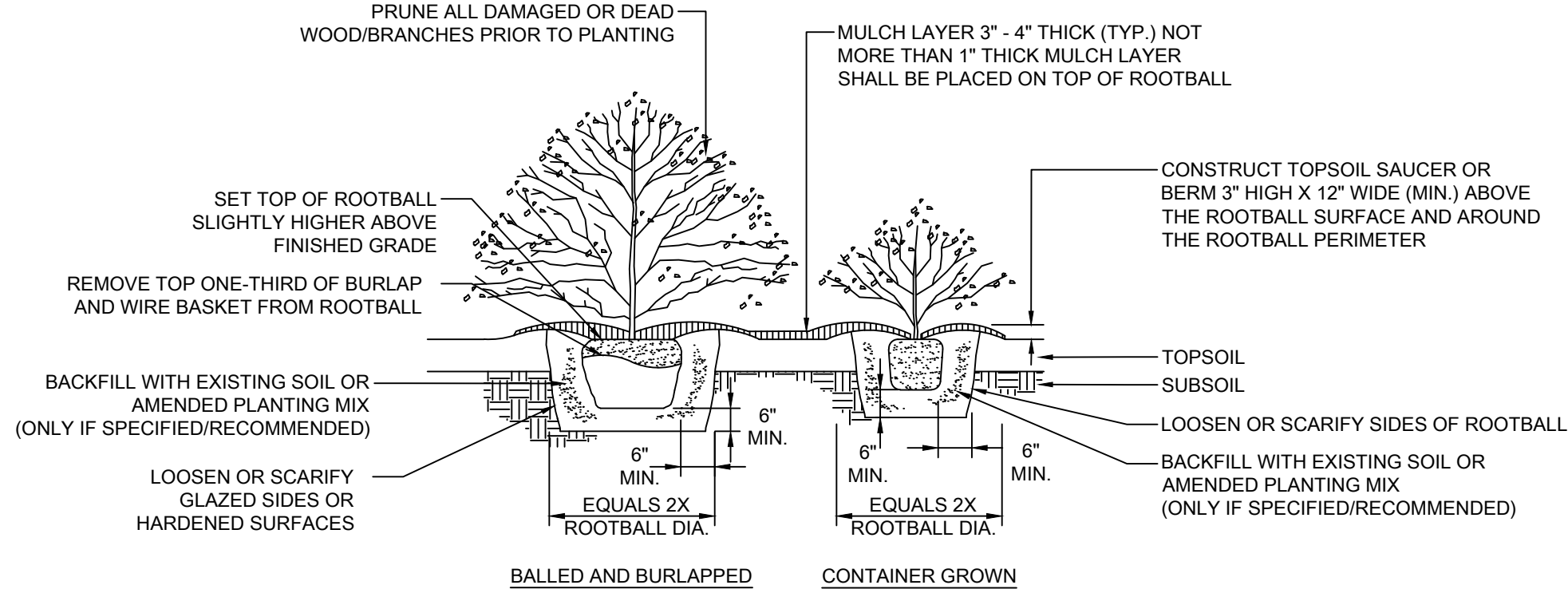
- GENERAL LANDSCAPING NOTES AND VEGETATION MANAGEMENT RECOMMENDATIONS**
- THE LANDSCAPE PLAN AND DETAILS ARE FOR LANDSCAPING INFORMATION ONLY. PLEASE REFER TO THE SITE GRADING AND DRAINAGE PLAN FOR ALL OTHER INFORMATION.
 - THE CONTRACTOR SHALL MONITOR AND GUARANTEE THAT ALL PLANTS, TREES, AND SHRUBS SHALL BE HEALTHY AND FREE OF DISEASE FOR A PERIOD OF (2) TWO YEARS AFTER SUBSTANTIAL COMPLETION AND ACCEPTANCE BY THE OWNER. CONTRACTOR SHALL REPLACE ANY DEAD OR UNHEALTHY PLANTS AT CONTRACTOR'S EXPENSE. FINAL ACCEPTANCE SHALL BE MADE IF ALL PLANTS MEET THE GUARANTEE REQUIREMENTS INCLUDING MAINTENANCE. MAINTENANCE RESPONSIBILITIES INCLUDE INVASIVE SPECIES MONITORING, REMOVAL, AND SUPPLEMENTATION. MONITORING OF THE PROJECT SITE SHALL OCCUR IN THE SPRING AND THE FALL TO DETERMINE THE PRESENCE OF INVASIVE SPECIES. SHOULD ANY INVASIVE SPECIES BE IDENTIFIED WITHIN THE PROJECT SITE, THE INVASIVE SPECIES SHALL BE REMOVED ACCORDING TO METHODS MOST LIKELY TO BE EFFECTIVE IN CONTROLLING THAT SPECIES AND SUPPLEMENTING ITS REPLACEMENT WITH APPROPRIATE VEGETATION AND SEED MIX IDENTIFIED (AND APPROVED) ON THIS PLAN AND/OR AN APPROVED EQUAL. ADDITIONAL MAINTENANCE RESPONSIBILITIES INCLUDE: APPROVED CULTIVATING, SPRAYING, WEEDING, WATERING, TIGHTENING OF TREE STRAP GUYS, PRUNING, FERTILIZING, MULCHING, AND ANY OTHER OPERATIONS NECESSARY TO MAINTAIN PLANT VIABILITY. MAINTENANCE SHALL BEGIN IMMEDIATELY AFTER PLANTING AND CONTINUE UNTIL 90 DAYS AFTER FINAL ACCEPTANCE.
 - PLANTS SHALL BE INSPECTED ANNUALLY FOR (5) FIVE YEARS POST-CONSTRUCTION AND REPLACED AS NEEDED TO ENSURE A CONTINUOUS SCREEN BECOMES ESTABLISHED.
 - WITHIN 24-HOURS OF PLANTING, AND CONTINUING THROUGHOUT ESTABLISHMENT (TWO MONTHS OR LONGER IN DROUGHT CONDITIONS), PLANTS SHALL BE WATERED WEEKLY UNLESS 0.5-INCHES OF RAIN OR GREATER FALLS WITHIN A GIVEN WEEK.
 - THE CONTRACTOR SHALL SUPPLY ALL LABOR, PLANTS, APPROVED SEEDING MIX, AND MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE WORK SHOWN ON THE DRAWING(S) AND LISTED IN THE PLANT SCHEDULE(S) AND/OR SEEDING TABLE(S). IN THE EVENT OF A DISCREPANCY BETWEEN QUANTITIES SHOWN IN THE PLANT SCHEDULE AND/OR SEEDING TABLE AND THOSE REQUIRED BY THE DRAWINGS, THE LARGER SHALL APPLY. ALL PLANTS SHALL BE ACCLIMATED BY THE SUPPLY NURSERY TO THE LOCAL HARDINESS ZONE AND BE CERTIFIED THAT THE PLANTING MATERIAL HAS BEEN GROWN FOR A MINIMUM OF (2) TWO YEARS AT THE SOURCE AND OBTAINED WITHIN 100 MILES OF PROJECT SITE UNLESS OTHERWISE APPROVED BY OWNER, CERTIFIED LANDSCAPE INSPECTOR, OR LANDSCAPE ARCHITECT.
 - THE LOCATIONS FOR PLANT MATERIAL ARE APPROXIMATE AND ARE SUBJECT TO FIELD ADJUSTMENT DUE TO SLOPE, VEGETATION, AND SITE FACTORS SUCH AS THE LOCATION OF ROCK OUTCROPS. PRIOR TO PLANTING THE CONTRACTOR SHALL ACCURATELY STAKE OUT THE LOCATIONS FOR ALL PLANTS. THE OWNER, CERTIFIED LANDSCAPE INSPECTOR, OR LANDSCAPE ARCHITECT SHALL APPROVE THE FIELD LOCATIONS OR ADJUSTMENTS OF THE PLANT MATERIAL.
 - ALL SHRUB MASSING SHALL BE MULCHED TO A DEPTH OF 2" AND SHREDDED HARDWOOD BARK MULCH SHALL BE USED FOR SHRUB MASSING AREAS.
 - NO PLANT SHALL BE PLACED IN THE GROUND BEFORE ROUGH GRADING HAS BEEN COMPLETED AND APPROVED BY THE OWNER, CERTIFIED LANDSCAPE INSPECTOR, OR LANDSCAPE CONTRACTOR. STAKING THE LOCATION OF ALL TREES AND SHRUBS SHALL BE COMPLETED PRIOR TO PLANTING FOR APPROVAL BY THE OWNER, CERTIFIED LANDSCAPE INSPECTOR, OR LANDSCAPE ARCHITECT. STAKING OF THE INSTALLED TREE MUST BE COMPLETED THE SAME DAY AS IT IS INSTALLED. ALL TREES SHALL BE STAKED OR GUYED AS PER THE DETAIL. SEE LANDSCAPING PLAN(S) FOR PLANTING DETAILS.
 - COORDINATE PLANT MATERIAL LOCATIONS WITH SITE UTILITIES. SEE SITE GRADING AND DRAINAGE PLAN. UTILITY LOCATIONS ARE APPROXIMATE. EXERCISE CARE WHEN DIGGING IN AREAS OF POTENTIAL CONFLICT WITH UNDERGROUND OR OVERHEAD UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE DUE TO CONTRACTOR'S NEGLIGENCE AND SHALL REPLACE OR REPAIR ANY DAMAGE AT CONTRACTOR'S EXPENSE.
 - LANDSCAPE PLANTING PITS MUST BE FREE DRAINING. PAVEMENT, COMPACTED SUBGRADE, AND BLASTED ROCK SHALL BE REMOVED TO A DEPTH OF 2' OR TO A GREATER DEPTH IF REQUIRED BY PLANTING DETAILS OR SPECIFICATIONS. REPLACE SOIL WITH MODERATELY COMPACTED LOAM OR SANDY LOAM FREE FROM STONES AND RUBBISH 1" OR GREATER IN DIAMETER AND ANY OTHER MATERIAL HARMFUL TO PLANT GROWTH AND DEVELOPMENT. PLANTING INSTALLATION SHALL BE AS DETAILED AND CONTAIN PLANTING MIX AS SPECIFIED UNLESS OTHERWISE SPECIFIED BY SOIL ANALYSIS.
PLANTING SOIL MIXTURE:
 - 2 PARTS PEAT MOSS
 - 5 PARTS TOPSOIL
 - MYCORRHIZA INOCULANT - "TRANSPLANT 1-STEP" AS MANUFACTURED BY ROOTS, INC. OR APPROVED EQUAL. USE PER MANUFACTURER'S RECOMMENDATIONS FOR TREES AND SHRUBS. FERTILIZER/LINE APPLY AS RECOMMENDED BY SOIL ANALYSIS
 - TREES, AND SHRUBS: TREES AND SHRUBS SHALL BE NURSERY GROWN UNLESS OTHERWISE NOTED AND HARDY UNDER CLIMATIC CONDITIONS SIMILAR TO THOSE IN THE LOCATION OF THE PROJECT. THEY SHALL BE TYPICAL OF THEIR SPECIES OR VARIETY, WITH NORMAL HABIT OF GROWTH. THEY SHALL BE SOUND, HEALTHY, VIGOROUS, WELL-BRANCHED AND DENSELY FOLIATED WHEN IN LEAF. THEY SHALL BE FREE OF DISEASE, INSECT PESTS, EGGS OR LARVAE. THEY SHALL HAVE HEALTHY AND WELL-DEVELOPED ROOT SYSTEMS. ALL TREES SHALL HAVE STRAIGHT SINGLE TRUNKS WITH THEIR MAIN LEADER INTACT UNLESS OTHERWISE STATED. THE OWNER, CERTIFIED LANDSCAPE INSPECTOR, OR LANDSCAPE ARCHITECT SHALL ONLY PERMIT SUBSTITUTIONS UPON WRITTEN APPROVAL. THEIR SIZES SHALL CONFORM TO THE MEASUREMENT SPECIFIED ON THE DRAWINGS. PLANTS LARGER THAN SPECIFIED ON THE DRAWINGS MAY BE USED IF APPROVED. THE USE OF SUCH PLANTS SHALL NOT INCREASE THE CONTRACT PRICE. ALL TREES AND SHRUBS SHALL BE MULCHED IN ACCORDANCE WITH THE RESPECTIVE PLANTING DETAIL(S) PROVIDED IN THE LANDSCAPING PLAN.
 - ALL PRUNING SHALL CONFORM TO THE TREE CARE INDUSTRY ASSOCIATION (TCIA) ANSI A300 (PART 1) - 2017 PRUNING STANDARDS. PRUNING STANDARDS SHALL RECOGNIZE BUT, ARE NOT LIMITED TO, THE FOLLOWING PRUNING OBJECTIVES: MANAGE RISK, MANAGE HEALTH, DEVELOP STRUCTURE, PROVIDE CLEARANCE, MANAGE SIZE OR SHAPE, IMPROVE AESTHETICS, MANAGE PRODUCTION OF FRUIT, FLOWERS, OR OTHER PRODUCTS, AND/OR MANAGE WILDLIFE HABITAT. DEVELOPING STRUCTURE SHALL IMPROVE BRANCH AND TRUNK ARCHITECTURE, PROMOTE OR SUBORDINATE CERTAIN LEADERS, STEMS, OR BRANCHES; PROMOTE DESIRABLE BRANCH SPACING; PROMOTE OR DISCOURAGE GROWTH IN A PARTICULAR DIRECTION (DIRECTIONAL PRUNING); MINIMIZE FUTURE INTERFERENCE WITH TRAFFIC, LINES OF SIGHT, INFRASTRUCTURE, OR OTHER PLANTS; RESTORE PLANTS FOLLOWING DAMAGE; AND/OR REJUVENATE SHRUBS. PROVIDING CLEARANCE SHALL ENSURE SAFE AND RELIABLE UTILITY SERVICES; MINIMIZE CURRENT INTERFERENCE WITH TRAFFIC, LINES OF SITE, INFRASTRUCTURE, OR OTHER PLANTS; RAISE CROWN(S) FOR MOVEMENT OF TRAFFIC OR LIGHT PENETRATION; ENSURE LINES OF SIGHT OR DESIRED VIEWS; PROVIDE ACCESS TO SITES, BUILDINGS, OR OTHER STRUCTURES; AND/OR COMPLY WITH REGULATIONS.
 - TOPSOIL SURROUNDING LANDSCAPING FEATURES SHALL BE INSTALLED AT A MINIMUM DEPTH OF 4 INCHES. CONTRACTOR SHALL SUBMIT TOPSOIL TO A CERTIFIED TESTING LABORATORY TO DETERMINE PH, FERTILITY, ORGANIC CONTENT AND MECHANICAL COMPOSITION. THE CONTRACTOR SHALL SUBMIT THE TEST RESULTS FROM REGIONAL EXTENSION OFFICE OF USDA TO THE OWNER, CERTIFIED LANDSCAPE INSPECTOR, OR LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL. CONTRACTOR SHALL INCORPORATE AMENDMENTS FOR GOOD PLANT GROWTH AND PROPER SOIL ACIDITY RECOMMENDED FROM THE TOPSOIL TEST.
 - NO PHOSPHOROUS SHALL BE USED AT PLANTING TIME UNLESS SOIL TESTING HAS BEEN COMPLETED AND TESTED BY A HORTICULTURAL TESTING LAB AND SOIL TESTS SPECIFICALLY INDICATE A PHOSPHOROUS DEFICIENCY THAT IS HARMFUL, OR WILL PREVENT NEW LAWNS/GRASSES AND PLANTINGS FROM ESTABLISHING PROPERLY.
 - IF SOIL TESTS INDICATE A PHOSPHOROUS DEFICIENCY THAT WILL IMPACT PLANT AND LAWN ESTABLISHMENT, PHOSPHOROUS SHALL BE APPLIED AT THE MINIMUM RECOMMENDED LEVEL PRESCRIBED IN THE SOIL TEST FOLLOWING ALL APPLICABLE STANDARDS, REQUIREMENTS, AND/OR REGULATIONS.
 - ALL WILDFLOWERS AND GRASSES SOWN SHALL BE ALLOWED TO GROW TO THEIR NATURALLY OCCURRING HEIGHTS WHENEVER POSSIBLE. NATIVE WILDFLOWERS AND/OR GRASSES CAN BE MOWED/MAINTAINED (WITHIN ACCEPTABLE AREAS IDENTIFIED AND/OR APPROVED BY APPROPRIATE REGULATORY AGENCIES) AS OFTEN AS NEEDED TO KEEP THE VEGETATION AT A DESIRED AND/OR MANAGEABLE/MANICURED HEIGHT.
 - INVASIVE SPECIES SHALL NOT BE PERMITTED.
 - ALL PLANT MATERIAL SHALL CONFORM TO THE PLAN SIZE SPECIFICATIONS AS ESTABLISHED BY THE AMERICAN STANDARD FOR NURSERY STOCK LATEST EDITION.



EVERGREEN TREE PLANTING DETAIL

NOTES

- TREE PLANTING SHALL BEAR SAME RELATIONSHIP TO FINISH GRADE AS IT WAS PRE-DUG IN THE NURSERY.
- NEVER CUT THE PRIMARY LEADER.
- IT IS NOT RECOMMENDED TO AMEND THE EXISTING SOIL BEFORE BACKFILLING THE HOLE UNLESS SOIL CONDITIONS ARE POOR FOR PLANTING.
- WATER THOROUGHLY TO HELP ENSURE THE REMOVAL OF AIR POCKETS AND PROPERLY SET THE TREE.



SHRUB PLANTING DETAIL

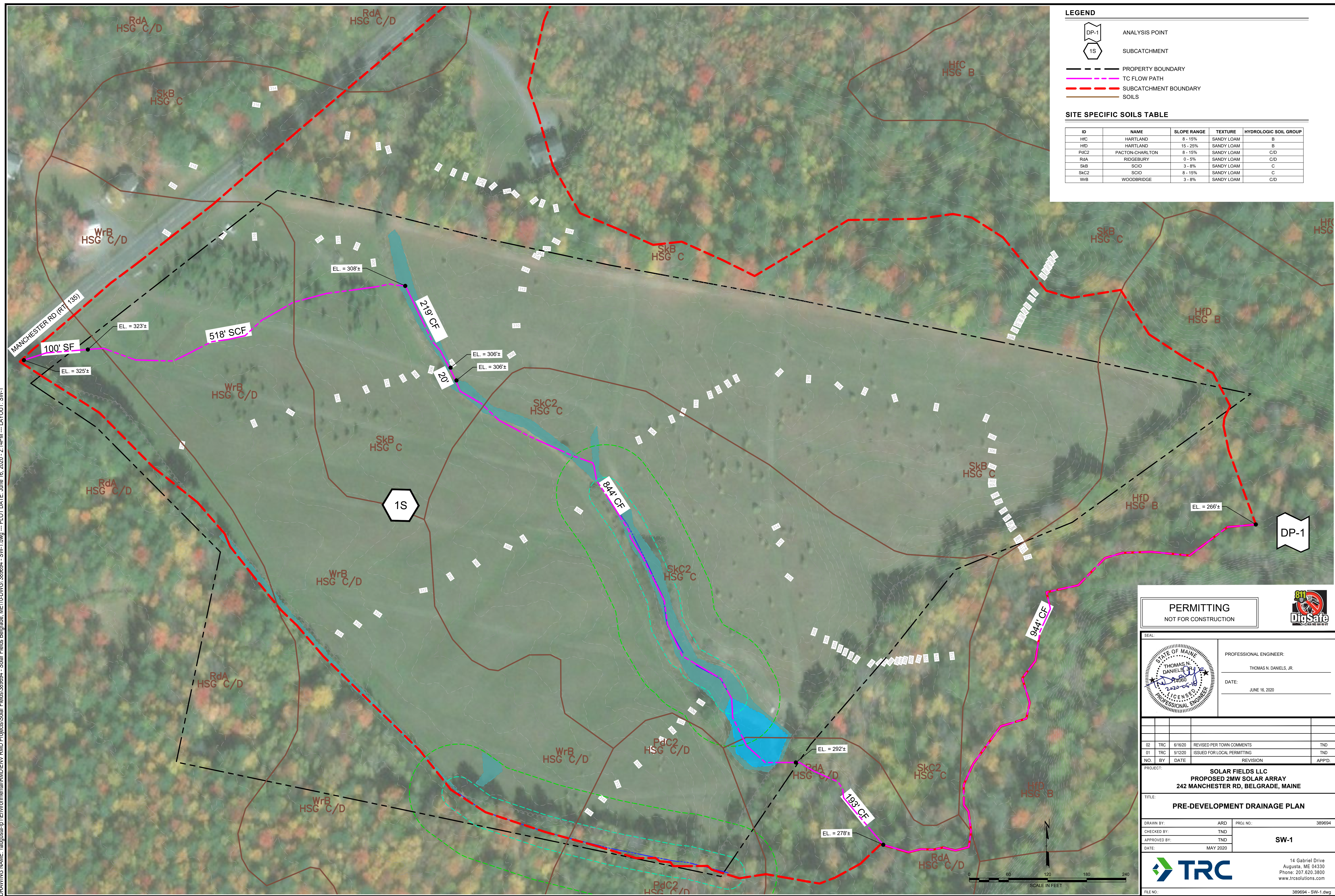
DETAIL NOTES

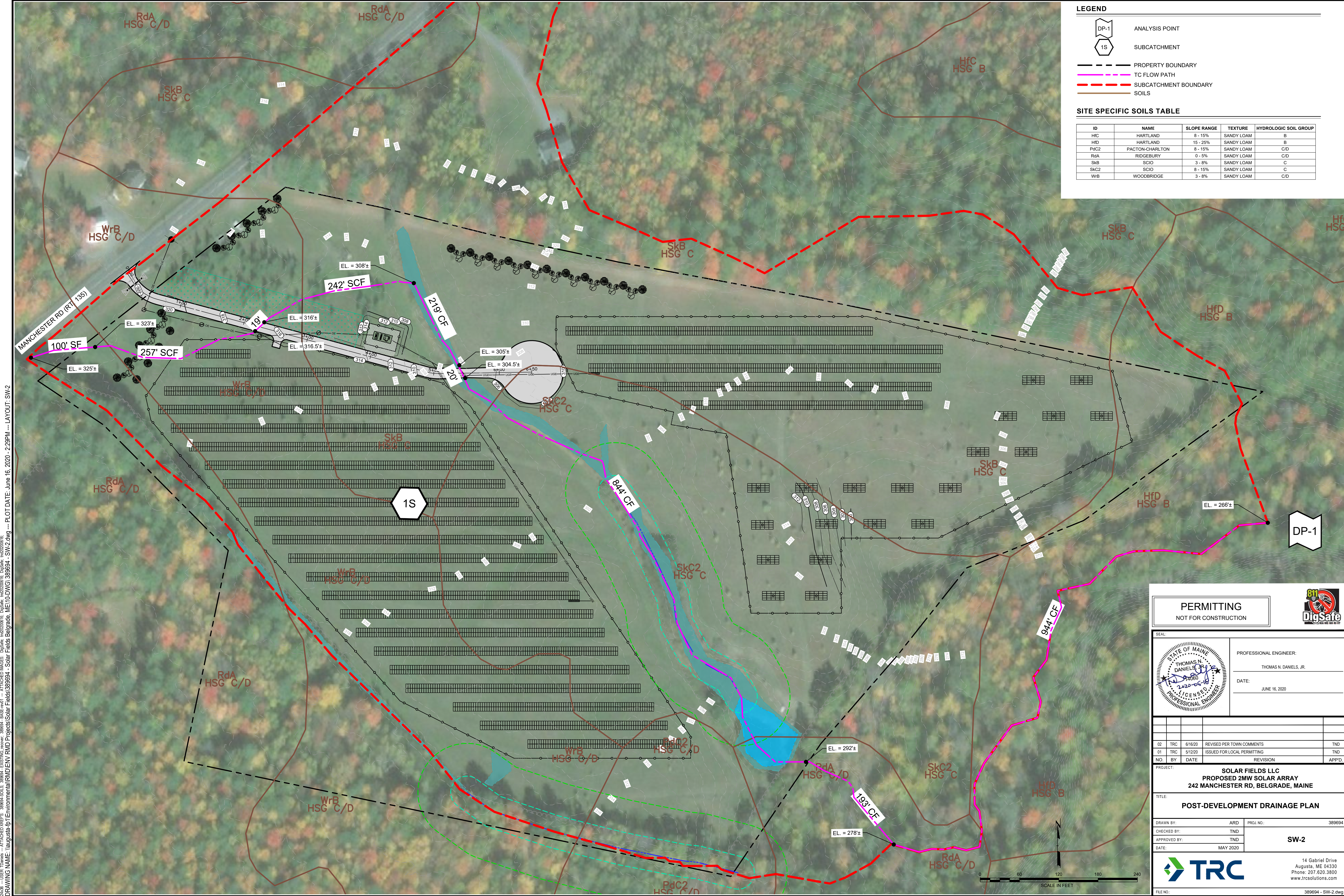
- IN AREAS WITH MASS PLANTINGS, CONTINUOUS EXCAVATION AND MULCHING PRACTICES SHALL BE IMPLEMENTED WHENEVER POSSIBLE.
- IT IS NOT RECOMMENDED TO AMEND THE EXISTING SOIL BEFORE BACKFILLING THE HOLE UNLESS SOIL CONDITIONS ARE POOR FOR PLANTING.
- WATER THOROUGHLY TO HELP ENSURE THE REMOVAL OF AIR POCKETS.

PERMITTING
NOT FOR CONSTRUCTION



SEAL:			
		PROFESSIONAL ENGINEER: THOMAS N. DANIELS, JR. DATE: JUNE 16, 2020	
02	TRC	6/16/20	REVISED PER TOWN COMMENTS
01	TRC	5/12/20	ISSUED FOR LOCAL PERMITTING
NO.	BY	DATE	REVISION
PROJECT: SOLAR FIELDS LLC PROPOSED 2MW SOLAR ARRAY 242 MANCHESTER RD, BELGRADE, MAINE			
TITLE: LANDSCAPING NOTES & DETAILS			
DRAWN BY: TRC		PROJ. NO.: 389694	
CHECKED BY: TND		C-5	
APPROVED BY: TND			
DATE: MAY 2020			
		14 Gabriel Drive Augusta, ME 04330 Phone: 207.620.3800 www.trcsolutions.com	
FILE NO:		389694 - DT.dwg	





LEGEND

DP-1

1S

ANALYSIS POINT

SUBCATCHMENT

PROPERTY BOUNDARY

TC FLOW PATH

SUBCATCHMENT BOUNDARY

SOILS

SITE SPECIFIC SOILS TABLE

ID	NAME	SLOPE RANGE	TEXTURE	HYDROLOGIC SOIL GROUP
HfC	HARTLAND	8 - 15%	SANDY LOAM	B
HfD	HARTLAND	15 - 25%	SANDY LOAM	B
PdC2	PACTON-CHARLTON	8 - 15%	SANDY LOAM	C/D
RdA	RIDGEBURY	0 - 5%	SANDY LOAM	C/D
SkB	SCIO	3 - 8%	SANDY LOAM	C
SkC2	SCIO	8 - 15%	SANDY LOAM	C
WfB	WOODBIDGE	3 - 8%	SANDY LOAM	C/D

2406 -- USER: Thomas -- ATTACHED: 389694.dwg -- EXISTING: 389694.dwg -- ATTACHED: 389694.dwg -- DATE: 6/16/2020 -- TIME: 2:29PM -- LAYOUT: SW-2
DRAWING NAME: \\augusta-tp1\Environmental\RD\ENV RMD Projects\Solar Fields\389694 - Solar Fields Belgrade, ME\10-DWG\389694 - SW-2.dwg
version: 2017-10-21

PERMITTING
NOT FOR CONSTRUCTION

SEAL

PROFESSIONAL ENGINEER:

THOMAS N. DANIELS, JR.

DATE:

JUNE 16, 2020

NO.	BY	DATE	REVISION	APPD.
02	TRC	6/16/20	REVISED PER TOWN COMMENTS	TND
01	TRC	5/12/20	ISSUED FOR LOCAL PERMITTING	TND

PROJECT:

SOLAR FIELDS LLC
PROPOSED 2MW SOLAR ARRAY
242 MANCHESTER RD, BELGRADE, MAINE

TITLE:

POST-DEVELOPMENT DRAINAGE PLAN

DRAWN BY:

ARD

PROJ. NO.:

389694

CHECKED BY:

TND

APPROVED BY:

TND

DATE:

MAY 2020

SW-2

14 Gabriel Drive
Augusta, ME 04330
Phone: 207.620.3800
www.trcsolutions.com

FILE NO.:

389694 - SW-2.dwg

PREPARED FOR:

SOLAR FIELDS, LLC
376 WEST ROAD
BELGRADE, ME 04917

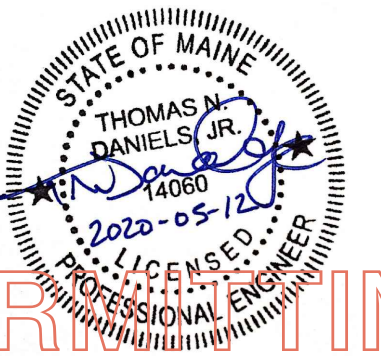
DATE: MAY 2020

SHEET INDEX

MAINE

BELGRADE

SITE LOCATOR



NOTE: THESE PLANS ARE ACCOMPANIED BY COMMERCIAL DEVELOPMENT REVIEW AND STORMWATER MANAGEMENT APPLICATIONS OF THE SAME TITLE. THESE DOCUMENTS ARE INTERRELATED AND ARE INTENDED TO BE USED TOGETHER FOR PERMITTING PURPOSES ONLY

NOT FOR CONSTRUCTION



14 Gabriel Drive
Augusta, ME 04330
Phone: 207.620.3800
www.trcsolutions.com

2438 --USER: Tdaniel --ATTACHED:RFPES - Maine office & Town boundaries -- ATTACHED:IMAGES - DigSafe, 1020705512
DRAWING NAME: \\augusta-bp1\Environmental\RMDEV\RD Projects\Solar Fields\389694 - Solar Fields Belgrade, ME\10-DWG\389694-G-SHEETS.dwg -- PLOT DATE: May 12, 2020 - 4:25PM -- LAYOUT: G-2
Version: 2017-10-21

GENERAL NOTES

- THE PROJECT HORIZONTAL COORDINATES SYSTEM IS BASED ON NAD83 MAINE STATE PLANE (US SURVEY FEET, WESTERN ZONE, ME83-WF). ELEVATIONS ARE BASED ON NAVD88 (US SURVEY FEET).
- TOPOGRAPHIC SURVEY INFORMATION DATA IS COMPILED FROM AERIAL MAPPING (LIDAR) PROVIDED BY THE MAINE OFFICE OF GIS AND SHOULD BE CONSIDERED TO BE APPROXIMATE.
- PROJECT PROPERTY BOUNDARIES ARE BASED ON INFORMATION PROVIDED IN A SURVEY PLAN BY GARBACICK SURVEYORS OF AUGUSTA, ME AS WELL AS TOWN OF BELGRADE TAX MAPS.
- EXISTING UTILITIES ARE APPROXIMATE AND SHOULD BE VERIFIED BY CONTRACTOR. DIGSAFE SHALL BE NOTIFIED A MINIMUM OF 72-HOURS PRIOR TO COMMENCING ANY EXCAVATION.
- THIS IS A PRELIMINARY DESIGN PLAN. FINAL DESIGN SHALL BE MODIFIED BY CONTRACTOR TO MATCH FINAL ELECTRICAL INTERCONNECTION STUDIES, EQUIPMENT PURCHASED, AND POSSIBLE PERMIT CONSTRAINTS REVEALED DURING PROJECT'S REVIEW.
- ALL WORK DETAILED ON THESE PLANS AND PERFORMED UNDER THIS CONTRACT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, THE PROJECT GEOTECHNICAL REPORT, AND ANY OTHER APPLICABLE TECHNICAL REPORTS. WHERE INDICATED, STATE AND/OR LOCAL STANDARD SPECIFICATIONS SHALL APPLY.
- THE CONTRACTOR SHALL ABIDE BY ALL LOCAL, STATE, AND FEDERAL LAWS, RULES AND REGULATIONS WHICH APPLY TO THE CONSTRUCTION OF THESE IMPROVEMENTS, INCLUDING STATE AND FEDERAL REQUIREMENTS WITH RESPECT TO STORMWATER DISCHARGE.
- THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITY LINES WITHIN OR ADJACENT TO THE CONSTRUCTION AREA. ANY DAMAGE TO EXISTING FACILITIES CAUSED BY CONSTRUCTION ACTIVITY SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.
- CONSTRUCTION SHALL NOT OCCUR IN ANY PUBLIC RIGHTS OF WAY, PUBLIC OR PRIVATE EASEMENTS, BEYOND THE LIMITS OF DISTURBANCE, OR OUTSIDE THE PROPERTY LIMITS WITHOUT NECESSARY PERMITS. ANY PUBLIC OR PRIVATE PROPERTY OR IMPROVEMENTS DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED TO THE SATISFACTION OF THE OWNER AT THE COST OF THE CONTRACTOR.
- OVERNIGHT PARKING OF CONSTRUCTION EQUIPMENT SHALL NOT OBSTRUCT DRIVEWAYS OR DESIGNATED TRAFFIC LANES. THE CONTRACTOR SHALL NOT STORE ANY EQUIPMENT OR MATERIAL WITHIN THE PUBLIC RIGHT OF WAY. OVERNIGHT PARKING OF CONSTRUCTION VEHICLES ON PRIVATE PROPERTY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- ALL PROPERTY CORNERS OR MONUMENTS DESTROYED DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. ALL PROPERTY CORNERS MUST BE RESET BY A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF MAINE.
- CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS CONTROLLING THE POLLUTION OF THE ENVIRONMENT.
- CONTRACTOR TO ENSURE ALL WORK PERFORMED IS IN ACCORDANCE WITH EXISTING PROJECT PERMITS, STUDIES, AND REPORTS PROVIDED IN THE CONTRACT DOCUMENTS INCLUDING STATE STORMWATER MANAGEMENT PERMIT AND LOCAL ORDINANCE.
- IT IS THE INTENT OF THESE PLANS THAT THE CONTRACTOR SHALL NOT PERFORM ANY WORK OUTSIDE THE IDENTIFIED PROJECT BOUNDARIES AND CLEARING LIMITS.
- IT IS THE INTENT OF THESE PLANS THAT THE CONTRACTOR AVOID "FILLING" WETLANDS AT ALL COSTS. CONTRACTOR TO AVOID THE DELINEATED WETLAND AREAS AND NATURAL RESOURCES ONSITE.
- WHENEVER PRACTICABLE, NO DISTURBANCE ACTIVITIES SHOULD TAKE PLACE WITHIN 50 FEET OF ANY PROTECTED NATURAL RESOURCE. IF DISTURBANCE ACTIVITIES SHOULD TAKE PLACE UPGRADIENT TO AND BETWEEN 30 FEET AND 50 FEET OF ANY PROTECTED NATURAL RESOURCE, PERIMETER EROSION CONTROLS MUST BE DOUBLED. IF DISTURBANCE ACTIVITIES TAKE PLACE UPGRADIENT TO AND LESS THAN 30 FEET FROM ANY PROTECTED NATURAL RESOURCE, PERIMETER EROSION CONTROLS MUST BE DOUBLED AND DISTURBED AREAS MUST BE TEMPORARILY OR PERMANENTLY STABILIZED WITHIN 7 DAYS. ALL AREAS WITHIN 75 FEET OF A PROTECTED NATURAL RESOURCE MUST BE PROTECTED WITH A DOUBLE ROW OF SEDIMENT BARRIERS NOVEMBER 1 THROUGH APRIL 15.
- CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THE PROJECT.
- CONTRACTOR SHALL FIELD FIT ALL PROPOSED CULVERT INVERTS TO PROVIDE POSITIVE DRAINAGE IN THE DIRECTION OF EXISTING SLOPES. ALL CULVERTS TO BE INSTALLED AT ADEQUATE DEPTHS AND TO DAYLIGHT. INLETS AND OUTLETS OF ALL CULVERTS TO BE STABILIZED WITH RIP RAP IN ACCORDANCE WITH THE SITE GRADING & DRAINAGE PLAN.
- EXISTING ACCESS ROADS TO BE MAINTAINED SHALL BE PROOF ROLLED, SMOOTHED, AND RESURFACED AS NECESSARY TO PROVIDE AN ACCEPTABLE SURFACE.
- THE CONTRACTOR SHALL SECURE PERMITS FROM THE STATE AND TOWN OF BELGRADE AS NECESSARY BEFORE DRIVING CONSTRUCTION EQUIPMENT OVER AND ACROSS STATE AND TOWN MAINTAINED ROADS.
- ALL WORK IN THE PUBLIC RIGHTS OF WAY SHALL CONFORM WITH THE MAINE DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS".
- WETLANDS AND NATURAL RESOURCES WERE DELINEATED BY BURMAN LAND & TREE COMPANY, LLC IN APRIL OF 2020.

HOUSEKEEPING NOTES

CONTRACTOR SHALL MAINTAIN THE PROJECT SITE IN ACCORDANCE WITH THE FOLLOWING PERFORMANCE STANDARDS:

- ~~SPILL PREVENTION:~~** CONTROLS SHALL BE IN PLACE TO PREVENT POLLUTANTS FROM BEING DISCHARGED FROM MATERIALS USED AND STORED ONSITE. APPROPRIATE CONTROLS INCLUDE, BUT ARE NOT LIMITED TO, PROPER STORAGE PRACTICES THAT MINIMIZE EXPOSURE OF MATERIALS TO STORMWATER, AND APPROPRIATE SPILL PREVENTION, CONTAINMENT, AND RESPONSE PLANNING AND IMPLEMENTATION.
- ~~GROUNDWATER PROTECTION:~~** DURING CONSTRUCTION, THE CONTRACTOR MAY NOT STORE OR HANDLE LIQUID PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS WITH THE POTENTIAL TO CONTAMINATE GROUNDWATER IN AREAS OF THE PROJECT SITES DRAINING TO AN INFILTRATION AREA OR WITHIN 100 FEET OF A CRITICAL RESOURCE AREA OR STREAM, DIKES, BERMS, SLUMPS, AND OTHER TYPES OF SECONDARY CONTAINMENT THAT PREVENT DISCHARGE TO GROUNDWATER MAY BE USED TO ISOLATE PORTIONS OF THE SITE FOR THE PURPOSES OF STORING AND HANDLING LIQUID HAZARDOUS MATERIALS.
- ~~FUGITIVE SEDIMENT AND DUST:~~** CONTRACTOR SHALL TAKE ALL NECESSARY ACTIONS TO ENSURE THAT ACTIVITIES DO NOT RESULT IN NOTICEABLE EROSION OF SOILS OR FUGITIVE DUST EMISSIONS DURING OR AFTER CONSTRUCTION. OPERATIONS DURING DRY MONTHS, THAT EXPERIENCE FUGITIVE DUST PROBLEMS, SHOULD WET DOWN UNPAVED ACCESS ROADS ONCE A WEEK OR MORE FREQUENTLY AS NEEDED WITH A WATER ADDITIVE. OIL MAY NOT BE USED FOR DUST CONTROL. CONTRACTOR SHALL MONITOR VEHICLES ENTERING AND EXITING THE PROJECT SITE FOR EVIDENCE OF TRACKING MUD ONTO PUBLIC OR PRIVATE ROADWAYS OUTSIDE THE WORK AREA. IF NECESSARY, CONTRACTOR SHALL PROVIDE MEANS FOR SWEEPING AND CLEANING ROAD AREAS EXPERIENCING TRACKING. IF OFF-SITE TRACKING OCCURS ON PUBLIC ROADS, THEY SHOULD BE SWEEP IMMEDIATELY AND NO LESS THAN ONCE A WEEK AND PRIOR TO SIGNIFICANT STORM EVENTS. DURING THE MUD SEASON IT MAY BE NECESSARY TO INCREASE THE SIZE OF STABILIZED CONSTRUCTION ENTRANCES OR PROVIDE A WHEEL WASHING STATION.
- ~~DEBRIS AND OTHER MATERIALS:~~** CONTRACTOR SHALL MANAGE ALL LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORMWATER TO PREVENT MATERIALS FROM BECOMING A SOURCE OF POLLUTION. CONTRACTOR SHALL MINIMIZE THE EXPOSURE OF CONSTRUCTION DEBRIS, BUILDING AND LANDSCAPING MATERIALS TO PRECIPITATION AND STORMWATER RUNOFF. THESE MATERIALS MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.
- ~~TRENCH OR FOUNDATION DEWATERING:~~** TRENCH DEWATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, COFFER DAMS, PONDS, SUMPS, BASINS, AND OTHER AREAS WITHIN THE CONSTRUCTION AREA THAT RETAIN WATER AFTER EXCAVATION. IN MOST CASES THE COLLECTED WATER IS HEAVILY SILTED AND HINDERS CORRECT AND SAFE CONSTRUCTION PRACTICES. THE CONTRACTOR SHALL REMOVE COLLECTED WATER FROM THE PONDED AREAS, EITHER THROUGH GRAVITY OR PUMPING, IN A MANNER THAT SPREADS IT THROUGH NATURAL WOODED BUFFERS OR TO AREAS THAT ARE SPECIFICALLY DESIGNED TO COLLECT THE MAXIMUM AMOUNT OF SEDIMENT POSSIBLE (E.G. COFFERDAM SEDIMENT BASIN). THE CONTRACTOR SHALL AVOID PRACTICES THAT ALLOW SEDIMENT LADEN WATER FROM DEWATERING TO FLOW OVER DISTURBED AREAS OF THE PROJECT SITES. OTHER MEASURES OR METHODS MAY BE UTILIZED AS REVIEWED AND APPROVED BY THE ENGINEER AND, IF NECESSARY, THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION.
- ~~AUTHORIZED NON-STORMWATER DISCHARGES:~~** THE CONTRACTOR SHALL IDENTIFY AND PREVENT CONTAMINATION BY NON-STORMWATER DISCHARGES. WHERE ALLOWED NON-STORMWATER DISCHARGES EXIST, THEY MUST BE IDENTIFIED AND STEPS SHALL BE TAKEN TO ENSURE IMPLEMENTATION OF APPROPRIATE POLLUTION PREVENTION MEASURES FOR THE NON-STORMWATER COMPONENTS OF THE DISCHARGE. AUTHORIZED NON-STORMWATER DISCHARGES ARE: DISCHARGES FROM FIREFIGHTING ACTIVITY, FIRE HYDRANT FLUSHING, VEHICLE WASHING IF DETERGENTS ARE NOT USED AND WASHING IS LIMITED TO THE EXTERIOR OF VEHICLES, DUST CONTROL RUNOFF IN ACCORDANCE WITH PERMIT CONDITIONS AND APPENDIX C(3) OF CHAPTER 500, ROUTINE EXTERNAL BUILDING WASHDOWN (EXCLUDING PAINT REMOVAL AND USE OF DETERGENTS), PAVEMENT WASHWATER (EXCLUDING AREAS OF SPILLS OR LEAKS OF TOXIC/HAZARDOUS MATERIALS AND USE OF DETERGENTS), UNCONTAMINATED AIR CONDITIONING OR COMPRESSOR CONDENSATE, UNCONTAMINATED GROUNDWATER OR SPRING WATER, FOUNDATION OR FOOTING DRAIN-WATER WHERE FLOWS ARE NOT CONTAMINATED, UNCONTAMINATED EXCAVATION DEWATERING PER APPENDIX C(5) OF CHAPTER 500, POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHING, AND LANDSCAPE IRRIGATION.
- ~~UNAUTHORIZED NON-STORMWATER DISCHARGES:~~** THE CONTRACTOR SHALL IDENTIFY AND PREVENT CONTAMINATION BY UNAUTHORIZED NON-STORMWATER DISCHARGES. UNAUTHORIZED STORMWATER DISCHARGES INCLUDE, BUT ARE NOT LIMITED TO, WASTEWATER FROM CONCRETE WASHOUT, FUELS OR HAZARDOUS SUBSTANCES, AND DETERGENTS USED IN VEHICLE AND EQUIPMENT WASHING.
- ~~ADDITIONAL REQUIREMENTS:~~** COMPLETION OF THE WORK WILL REQUIRE FREQUENT ACCESS TO VARIOUS PORTIONS OF THE PROJECT AREA FROM STATE AND LOCAL ROADWAYS. CONTRACTOR SHALL MONITOR PUBLIC ROADWAYS AND SHALL CLEAN PAVEMENT BY MEANS NECESSARY IN THE EVENT THAT SEDIMENT OR TRACKING IS OBSERVED. SIGNAGE SHALL BE POSTED AT INTERSECTIONS OF PROJECT ACCESS ROADS AND PUBLIC WAYS, STATING COMPANY NAME AND 24-HOUR CONTACT PHONE NUMBER.

LEGEND

	SUBJECT PROPERTY BOUNDARY
	APPROXIMATE ABUTTING PROPERTY BOUNDARY
	APPROXIMATE RIGHT-OF-WAY
	EXISTING UNPAVED ROAD
	EXISTING FENCE
	EXISTING WATERLINE
	EXISTING BUILDING
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	EXISTING SPOT ELEVATION
	EXISTING TREES AND/OR BRUSH
	DELINEATED WETLAND
	EXISTING POND
	DELINEATED STREAM
	NON-JURISDICTIONAL DRAINAGE
	LIMIT OF FEMA 100YR 24HR FLOOD ZONE
	EXISTING CULVERT
	EXISTING OVERHEAD ELECTRIC
	EXISTING UTILITY POLE
	LIMITS OF DISTURBANCE
	PROPOSED CULVERT
	PROPOSED ACCESS ROAD
	PROPOSED MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED TREE LINE
	PROPOSED CHAIN LINK FENCE
	NRCS SOILS DATA
	PROPOSED SILT FENCE
	PROPOSED OVERHEAD ELECTRIC LINE AND POLE
	75' STREAM BUFFER
	25' STREAM BUFFER
	VEGETATED WATER QUALITY BUFFER

ZONING REQUIREMENTS

DIMENSIONAL STANDARDS								
DISTRICT	MIN. FRONT YARD SETBACK		MIN. SIDE YARD SETBACK		MIN. REAR YARD SETBACK		BUILDING MAX. HEIGHT	
	REQUIRED	PROVIDED	REQUIRED	PROVIDED	REQUIRED	PROVIDED	REQUIRED	PROVIDED
NONE	NA	118'	NA	27'	NA	83'	NA	20'

SITE SPECIFIC SOILS TABLE

ID	NAME	SLOPE RANGE	TEXTURE	HYDROLOGIC SOIL GROUP
H1C	HARTLAND	8 - 15%	SANDY LOAM	B
H1D	HARTLAND	15 - 25%	SANDY LOAM	B
P1C2	PACTION-CHARLTON	8 - 15%	SANDY LOAM	C/D
R1A	RIDGEBURY	0 - 5%	SANDY LOAM	C/D
SK1	SCIO	3 - 8%	SANDY LOAM	C
SK2	SCIO	8 - 15%	SANDY LOAM	C
WB	WOODBIDGE	3 - 8%	SANDY LOAM	C/D

PROJECT SCHEDULE

SPECIFICS OF HOW WORK IS TO BE COMPLETED SHALL ALSO BE BASED ON ENVIRONMENTAL CONSIDERATIONS ASSOCIATED WITH SEASONAL CHANGES. THE FOLLOWING DATES ARE PROVIDED TO ESTABLISH A GENERAL GUIDELINE FOR THESE SEASONS:

- WINTER: NOVEMBER 1 TO MARCH 19
- MUD SEASON: MARCH 20 TO APRIL 30
- SPRING: MAY 1 TO JUNE 21
- SUMMER: JUNE 22 TO SEPTEMBER 21
- FALL: SEPTEMBER 22 TO OCTOBER 31

FERTILIZER AND LIMESTONE REQUIREMENTS

IN GENERAL, FERTILIZER AND LIME APPLICATION RATES WILL FOLLOW THE GUIDELINES IDENTIFIED BELOW UNLESS SITE SPECIFIC SOIL TESTS IDENTIFY THE NEED FOR ALTERNATIVE FERTILIZER/LIME APPLICATION RATES. FERTILIZER WILL BE APPLIED TO UPLAND AREAS PRIOR TO SEEDING AT A RATE OF 800 POUNDS PER ACRE USING 10-0-0 (N-P205-K20) OR EQUIVALENT. GROUND LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) WILL BE APPLIED AT A RATE OF 3 TONS PER ACRE. AN EQUIVALENT MIXTURE OF FERTILIZER AND LIME MAY BE APPLIED USING THE HYDROSEEDING METHOD. NO LIME OR FERTILIZER WILL BE APPLIED TO WETLANDS.

MULCH ANCHORING REQUIREMENTS

ON SLOPES GREATER THAN 3 PERCENT, STRAW MULCH WILL BE FIRMLY ANCHORED INTO THE SOIL UTILIZING ONE OF THE FOLLOWING METHODS:
- CRIMPING WITH A STRAIGHT OR NOTCHED MULCH CRIMPING TOOL (FARM DISCS WILL NOT BE ALLOWED);
- TRACK WALKING WITH DEEP-CLEATED EQUIPMENT OPERATING UP AND DOWN THE SLOPE (MULCH CRIMPED PERPENDICULAR TO THE SLOPE) ON SLOPES >25 PERCENT;
- APPLICATION OF MULCH NETTING;
- APPLICATION OF 500 LB./ACRE OF WOOD FIBER MULCH OVER STRAW/HAY MULCH; AND
- COMMERCIALLY AVAILABLE TACKIFIERS (EXCEPT WITHIN 100 FEET OF WATERBODIES OR WETLANDS).

PHOSPHORUS CONTROL PLAN NOTES

LAKE WATERSHED, MESSALONSKEE LAKE
WATERSHED PER ACRE PHOSPHORUS BUDGET: 0.068 LBS P/ACRE/YEAR
PROJECT PHOSPHORUS BUDGET: 1.646 LBS P/ACRE/YEAR
PROJECT PHOSPHORUS EXPORT: 0.589 LBS P/YEAR

SEED AND MULCH SPECIFICATIONS

SEED MIX SPECIFICATIONS		
SEED MIX NAME ¹	SEED MIX COMPONENTS	LB./ACRE ¹
TEMPORARY SEED MIX	ANNUAL RYEGRASS	40
PERMANENT SEED MIXES		
UPLANDS	NEW ENGLAND LOGGING ROAD MIX (OR APPROVED EQUAL)	20
WOODCHIP APPLICATION SEED MIX	NEW ENGLAND LOGGING ROAD MIX (OR APPROVED EQUAL)	20
SUPPLEMENTAL WINTER SEED MIX ²	WINTER RYEGRASS	120
NOTES: 1. INCREASE SEEDING RATES 10% WHEN HYDROSEEDING. 2. WINTER RYE WILL BE ADDED TO CONSERVATION MIX AT A RATE OF 120 LB./ACRE BETWEEN OCTOBER 1 AND APRIL 15. 3. PERMANENT SEED MIXES TO CONSIST OF NATIVE GRASSES, RUSHES, FORBS, AND WILDFLOWERS.		

SUMMARY OF TEMPORARY AND PERMANENT MULCH APPLICATION REQUIREMENTS			
CONDITION	TIMING	MULCH TYPE ²	APPLICATION RATES
TEMPORARY			
INACTIVE AREAS	IF NO ACTIVITY IN EXPOSED AREAS FOR 7 DAYS, OR PRIOR TO A STORM EVENT	STRAW MULCH OR WOOD FIBER MULCH OR EROSION CONTROL MIX	2 TONS/ACRE 1 TON/ACRE 2" THICK OVER AREA
ALL DISTURBED AREAS OF THE CONSTRUCTION WORKSPACE	APPLY MULCH TO ALL EXPOSED AREAS IF NO ACTIVITY OCCURS WITHIN 30 DAYS. APPLY MULCH AND TEMPORARY SEEDING SOONER WHEN IT CAN BE ANTICIPATED THAT ACTIVITY IS NOT GOING TO OCCUR WITHIN 30 DAYS.	STRAW MULCH OR WOOD FIBER MULCH	2 TONS/ACRE 1 TON/ACRE ³
ALL WORK AREAS EXPOSED ARE TO BE MULCHED DAILY EACH TIME SOIL IS DISTURBED ²	NOVEMBER 1 - APRIL 15	STRAW MULCH OR WOOD FIBER MULCH	4 TONS/ACRE 2 TONS/ACRE
PERMANENT			
ON ALL EXPOSED AREAS AFTER SEEDING TO STABILIZE THE SOIL SURFACE	PERMANENT GRASS AND/OR LEGUME SEEDING COVERED BY STRAW MULCH ON ALL AREAS THAT HAVE BEEN RESTORED TO FINAL GRADE. THIS DOES NOT APPLY TO AREAS STABILIZED BY OTHER MEANS SUCH AS JUTE MATTING OR PERMANENT EROSION CONTROL MIX.	CRIMPED STRAW MULCH OR PAPER MULCH OR WOOD FIBER MULCH	2 TONS/ACRE 1500 LB./ACRE ⁴ 1 TON/ACRE
WOOD CHIP APPLICATION AREAS ⁵	PERMANENT GRASS AND/OR LEGUME SEEDING COVERED BY STRAW MULCH ON ALL AREAS THAT HAVE BEEN RESTORED TO FINAL GRADE. THIS DOES NOT APPLY TO AREAS STABILIZED BY OTHER MEANS SUCH AS JUTE MATTING OR PERMANENT EROSION CONTROL MIX.	CRIMPED STRAW MULCH OR PAPER MULCH OR WOOD FIBER MULCH	2 TONS/ACRE 1500 LB./ACRE ⁴ 1 TON/ACRE
NOTES: 1. IN ALL CASES, SUFFICIENT MULCH SHALL BE APPLIED SUCH THAT NO SOIL IS VISIBLE THROUGH THE MULCH. 2. DOUBLE RATE OF WOOD FIBER MULCH WHEN USED IN OR ADJACENT TO CRITICAL AREAS. INCREASE MULCH RATE BY HALF UNDER SOLAR ARRAY DRIP EDGE. 3. STRAW, HAY, OR HYDROMULCH (WOOD FIBER OR PAPER MULCH AS APPROPRIATE) SHALL PROVIDE MINIMUM 90 PERCENT GROUND COVERAGE. 4. PAPER MULCH IS ACCEPTABLE FOR USE DURING THE GROWING SEASON. ON SLOPES >30 PERCENT AND IN AREAS WHERE VEGETATION HAS NOT ESTABLISHED WELL, ADDITIONAL HAY MULCH WILL BE ADDED AS A WINTERIZING MEASURE. 5. MULCH MAY NOT BE SPREAD ON TOP OF SNOW. 6. WOODCHIPS SHALL BE APPLIED AT A MAXIMUM THICKNESS OF 4-INCHES AND ONLY IN UPLAND AREAS.			

SUMMARY OF SEEDING REQUIREMENTS		
CONDITION	TIMING ^{1,2}	SEED MIX
TEMPORARY SEEDING ³	TEMPORARY SEED BETWEEN APRIL 15 AND OCTOBER 1 ONLY. DISTURBED AREAS OR SOIL STOCKPILES WILL BE SEED IMMEDIATELY IF FURTHER DISTURBANCE IS NOT EXPECTED FOR 30 DAYS OR MORE.	ANNUAL RYEGRASS
PERMANENT SEEDING ^{3,4}		
UPLAND PORTIONS OF THE CONSTRUCTION AREA	DISTURBED AREA WILL BE SEEDDED WITHIN 7 DAYS OF FINAL GRADING.	UPLAND MIX
SLOPES > 3:1	DISTURBED AREA WILL BE SEEDDED IMMEDIATELY AFTER SEEDBED PREPARATION.	UPLAND MIX
AS DIRECTED	DISTURBED AREAS DESIGNATED FOR STABILIZATION WITH THE POLLINATOR MIX SHALL BE SEEDDED WITHIN 7 DAYS OF FINAL GRADING.	POLLINATOR SEED MIX
WOODCHIP APPLICATION AREAS	DISTURBED AREA WILL BE SEEDDED WITHIN 7 DAYS OF FINAL GRADING.	WOODCHIP APPLICATION SEED MIX
WINTER DORMANT SEEDING	DORMANT SEED BETWEEN OCTOBER 1 AND APRIL 15 ONLY. NO SEEDING WILL OCCUR IF SNOW DEPTHS EXCEED 1 INCH.	CONSERVATION MIX PLUS WINTER RYEGRASS
NOTES: 1. WEATHER CONDITIONS PERMITTING. 2. AREAS THAT DO NOT SUCCESSFULLY REVEGETATE WITHIN APPROPRIATE PERIOD OF TIME WILL BE RESEED AS NECESSARY. 3. LOOSEN COMPACTED SOIL TO A MINIMUM DEPTH OF 4 INCHES. 4. TOP DRESS WITH 4 to 6 INCHES LOAM, AS NEEDED.		

PERMITTING

NOT FOR CONSTRUCTION

SEAL:	PROFESSIONAL ENGINEER:			
	THOMAS N. DANIELS, JR.			
	DATE: MAY 12, 2020			
01	TRC	5/12/20	ISSUED FOR LOCAL PERMITTING	TND
NO.	BY	DATE	REVISION	APPD.
PROJECT: SOLAR FIELDS LLC PROPOSED 2MW SOLAR ARRAY 242 MANCHESTER RD, BELGRADE, MAINE				
TITLE: GENERAL NOTES & LEGEND				
DRAWN BY: TRC/ARD		PROJ. NO.: 389694		
CHECKED BY: TND		G-2		
APPROVED BY: TND				
DATE: MAY 2020				
		14 Gabriel Drive Augusta, ME 04330 Phone: 207.620.3800 www.trcsolutions.com		
FILE NO.:		389694-G-SHEETS.dwg		

EROSION CONTROL NOTES

PROJECT DESCRIPTION

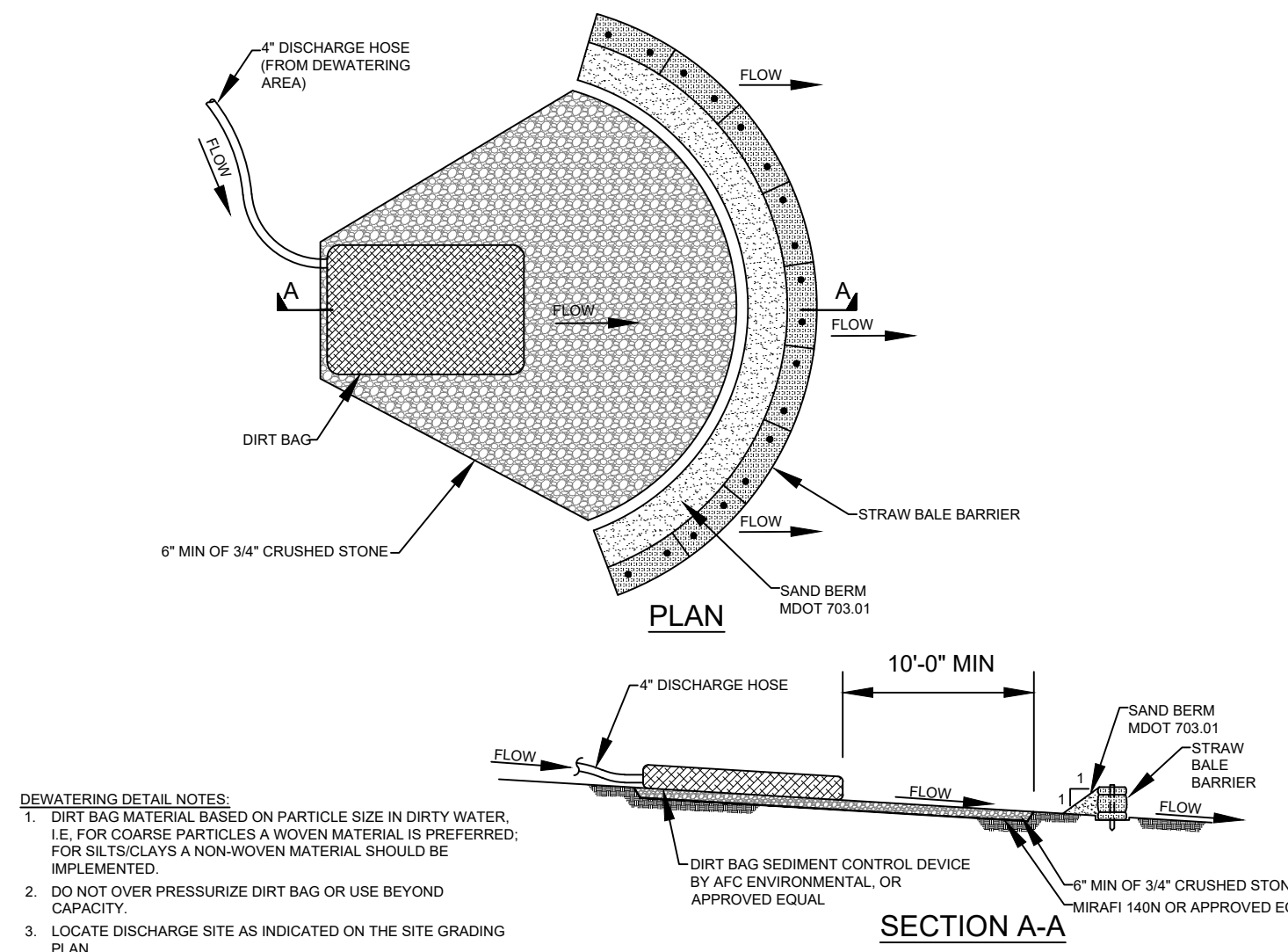
THE PROJECT INVOLVES THE CONSTRUCTION OF A GROUND-MOUNTED PHOTOVOLTAIC SOLAR MODULE SYSTEM AND ALL RELATED ACCESS ROADS, UTILITIES, SITE PREPARATION, CLEARING & GRUBBING, EROSION & SEDIMENTATION CONTROL MEASURES, AND TEMPORARY ACCESS ROADS.

CONSTRUCTION SEQUENCE

1. ALL CONTRACTORS ENGAGED IN SOIL DISTURBANCE SHALL BE CERTIFIED IN BASIC AND ADVANCED EROSION CONTROL PRACTICES BY MDEP UNLESS OTHERWISE APPROVED BY THE OWNER, ENGINEER, AND TOWN OF BELGRADE.
2. ESTABLISH CONSTRUCTION WORKSPACE LIMITS, IDENTIFY AND MARK SENSITIVE RECEPTORS INCLUDING NATURAL RESOURCES AND DOWNGRADIENT DRAINAGE INFRASTRUCTURE.
3. INSTALLATION OF ALL EROSION AND SEDIMENT CONTROL MEASURES AND ASSOCIATED WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE "MAINE EROSION AND SEDIMENT CONTROL PRACTICES FIELD GUIDE FOR CONTRACTORS" (REVISED 2014).
4. PRIOR TO USAGE, CONSTRUCT AND STABILIZE THE CONSTRUCTION ENTRANCE IN THE LOCATIONS INDICATED ON THE EROSION CONTROL PLAN SHEET.
5. CLEAR TIMBER, BRUSH, AND COMPLETE TREE REMOVAL, GRUBBING SHALL NOT BE COMPLETED UNTIL JUST PRIOR TO PRELIMINARY GRADING AND ESTABLISHMENT AND STABILIZATION OF TEMPORARY OR PERMANENT DRAINAGE CONVEYANCES.
6. INSTALL AND MAINTAIN PERIMETER DIVERSION BARRIERS SUCH AS SILT FENCING OR OTHER APPROVED EROSION CONTROL BARRIERS ALONG THE DOWNHILL LIMIT OF DISTURBANCE AS SHOWN ON THE DRAWINGS. SEDIMENT BARRIER LOCATIONS MAY BE ADJUSTED IN THE FIELD BASED ON ACTUAL SITE CONDITIONS AS DEEMED NECESSARY TO ENSURE PROPER FUNCTION. WHERE SILT FENCE CANNOT BE TOED-IN PROPERLY DUE TO TREE ROOTS, ROCKS, OR FROZEN GROUND, HAY BALES OR AN EROSION CONTROL MIX BERM MAY BE SUBSTITUTED. PERIMETER SEDIMENT BARRIERS SHALL BE INSTALLED AS SOON AS POSSIBLE BUT MAY FOLLOW INITIAL SITE PREPARATION, EROSION OR SEDIMENTATION ISSUES DEVELOPING DURING INITIAL SITE PREPARATION SHALL BE TEMPORARILY STABILIZED AS NECESSARY.
7. STABILIZE PERMANENT ACCESS ROAD SURFACES, PARKING AREAS, AND EQUIPMENT STORAGE AND LAYDOWN AREAS WITH MATTING, CRUSHED STONE, OR GRAVEL SUBBASE AS NECESSARY TO MINIMIZE RUTTING AND AVOID PONDING OF STORMWATER.
8. CONCURRENT WITH INITIATION OF SITE GRADING, CONSTRUCT AND STABILIZE TEMPORARY DRAINAGE SWALES, DIVERSION BERMS, CHECK DAMS, AND CULVERTS WITH TEMPORARY INLET AND OUTLET PROTECTION TO MINIMIZE SEDIMENT IN SITE RUNOFF DURING CONSTRUCTION. DEWATERING SHALL BE IN ACCORDANCE WITH THE DEWATERING NOTES.
9. INSTALL PROPERLY SPACED STONE CHECK DAMS IN ANY SECTION OF DITCH WITHIN 24-HOURS OF FORMING, SHAPING, OR ROUGH GRADING THAT SECTION DITCH.
10. MINIMIZE THE AMOUNT OF DISTURBANCE AT ANY ONE TIME BY STAGING CONSTRUCTION AS MUCH AS PRACTICAL FOR EFFICIENT CONSTRUCTION OF THE FACILITY. NATURAL VEGETATIVE BUFFERS SHOULD BE LEFT IN PLACE WHERE FEASIBLE TO AID IN SEDIMENT RETENTION AND REDUCE THE POTENTIAL FOR EROSION.
11. STABILIZE ANY NEWLY GRADED SLOPE GREATER THAN EIGHT PERCENT AND ANY SECTION OF NEWLY CONSTRUCTED DITCH USING ANCHORED EROSION CONTROL BLANKETS OR OTHER APPROVED MULCHING TECHNIQUES WITHIN 24-HOURS. ALL VEGETATED DITCHES THAT HAVE NOT BEEN STABILIZED BY NOVEMBER 1, OR WILL BE WORKED ON BETWEEN NOVEMBER 1 AND APRIL 15, MUST BE STABILIZED WITH STONE LINING BACKED BY GRAVEL BED OR GEOTEXTILE AS SPECIFIED BY THE ENGINEER.
12. DUST CONTROL METHODS SHALL BE EMPLOYED AFTER GRADING AND PRIOR TO FINAL STABILIZATION TO PREVENT THE BLOWING AND MOVEMENT OF NUISANCE DUST THROUGH THE APPLICATION OF WATER AND/OR CALCIUM CHLORIDE.
13. APPLY TEMPORARY SEED AND MULCH TO EXPOSED AREAS WHERE ACTIVITY IS NOT ANTICIPATED FOR 30-DAYS/ TEMPORARILY MULCH ANY EXPOSED AREAS WITHIN 100-FEET OF A WETLAND OR NATURAL RESOURCE WHERE WORK IS NOT ANTICIPATED OR HAS NOT OCCURRED IN 7 DAYS.
14. REMOVE EXCESS SPOILS FROM THE SITE THAT WILL NOT BE USED FOR THE FINAL DESIGN AND STABILIZATION. STOCKPILED SOILS THAT REMAIN IN PLACE FOR 48-HOURS OR MORE SHALL BE CONTAINED WITH SEDIMENT BARRIERS. THE SEDIMENT BARRIERS SHALL BE REINFORCED TO HANDLE A SIGNIFICANT RAIN EVENT AND THE POTENTIAL SLUMPING OF THE PILE. BETWEEN APRIL 15 AND OCTOBER 1, APPLY TEMPORARY SEED AND MULCH TO A STOCKPILE THAT IS NOT ANTICIPATED TO BE DISTURBED WITHIN 30-DAYS. APPLY ANCHORED MULCH DAILY AND/OR AS NEEDED DURING WINTER CONSTRUCTION.
15. INSPECT AND REPAIR EROSION CONTROL MEASURES DAILY IN AREAS OF ACTIVE CONSTRUCTION; OTHERWISE WEEKLY AND AFTER A RAINFALL EVENT OF 0.5-INCHES OR GREATER WITHIN A 24-HOUR PERIOD. REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES 1/2 OF THE HEIGHT OF THE BARRIER.
16. MONITOR PUBLIC ROADS FOR SIGNS OF TRACKING OR SPILLING OF SPOIL MATERIAL AND CLEAN-UP AS NECESSARY.
17. COMPLETE FINAL GRADING AND STABILIZATION OF EARTHEN STRUCTURES SUCH AS DIVERSION BERMS, LEVEL SPREADERS, AND SWALES THAT WILL CONTROL POST-CONSTRUCTION RUNOFF.
18. FINISH GRADE AND REPLACE TOPSOIL OR LOAM IN DISTURBED AREAS. SEED AND MULCH DISTURBED AREAS WITHIN 6 DAYS OF FINAL GRADING. BETWEEN NOVEMBER 1 AND APRIL 15, STABILIZE AREAS THAT ARE FINAL GRADED AT THE END OF EACH DAY.
19. MAINTAIN ALL TEMPORARY EROSION CONTROLS AND SEDIMENT BARRIERS UNTIL VEGETATION HAS BEEN ESTABLISHED OVER 90% OF THE AREA TO BE REVEGETATED. RESEED SPARSELY VEGETATED AREAS AS NECESSARY.
20. REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES ONCE THE SITE IS PERMANENTLY STABILIZED.

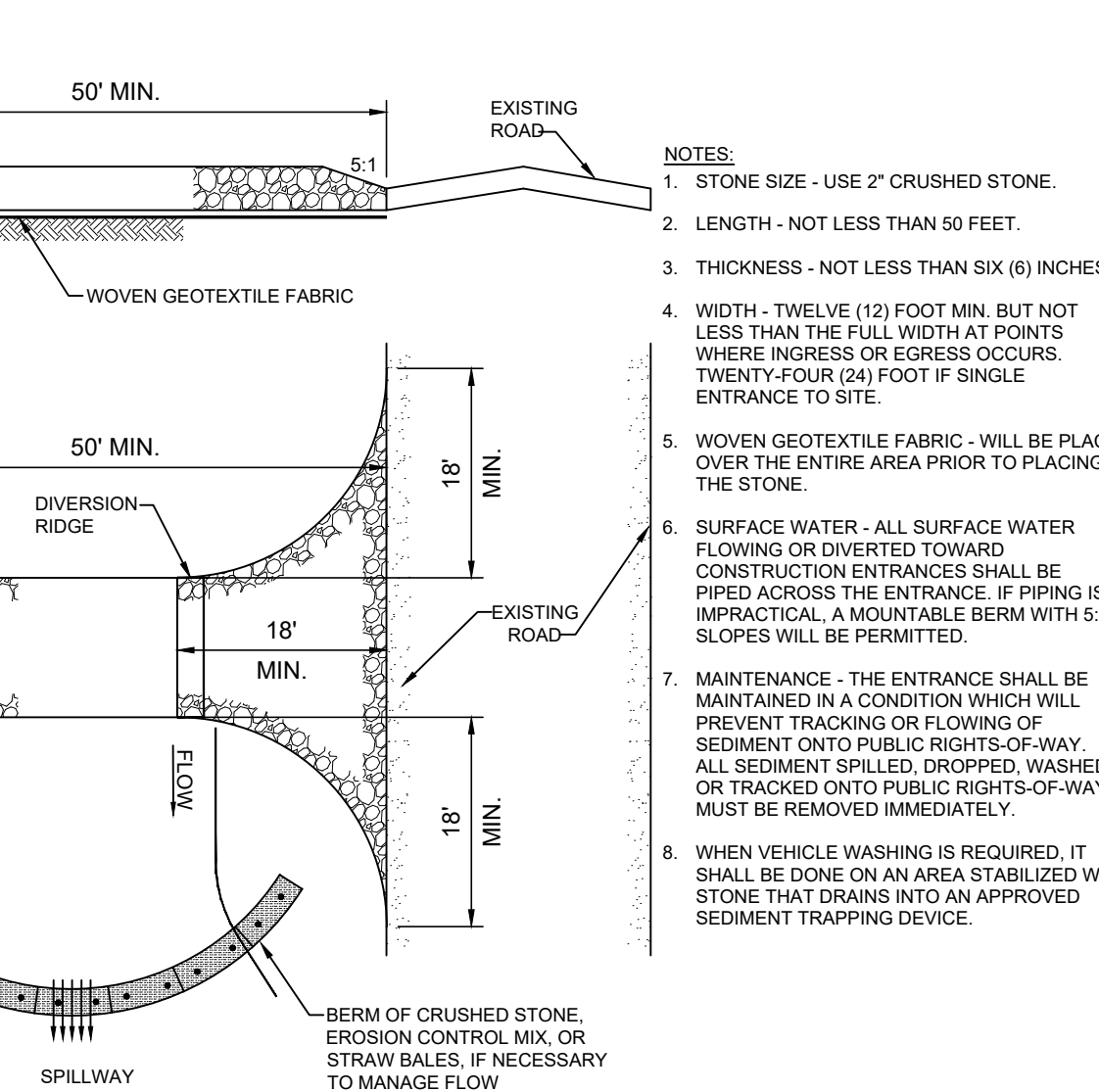
DEWATERING NOTES

1. THE CONTRACTOR SHALL INSTALL, MAINTAIN, AND OPERATE ALL CHANNELS, SUMPS, AND ALL OTHER TEMPORARY DIVERSION AND PROTECTIVE WORKS NEEDED TO DIVERT STREAM FLOW AND OTHER SURFACE WATER THROUGH OR AROUND THE CONSTRUCTION SITE. CONTROL OF SURFACE WATER SHALL BE CONTINUOUS DURING THE PERIOD THAT DAMAGE TO CONSTRUCTION WORK COULD OCCUR.
2. OPEN EXCAVATIONS SHALL BE DEWATERED AND KEPT FREE OF STANDING WATER AND MUDDY CONDITIONS AS NECESSARY FOR THE PROPER EXCAVATION WORK. THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE, AND MAINTAIN ALL DRAINS, SUMPS AND ALL OTHER EQUIPMENT REQUIRED TO PROPERLY DEWATER THE SITE. DEWATERING SYSTEMS THAT CAUSE A LOSS OF SOIL FINES FROM THE FOUNDATION AREAS WILL NOT BE PERMITTED.
3. INSTALL DIVERSION DITCHES OR BERMS IF NECESSARY TO MINIMIZE THE AMOUNT OF CLEAN STORMWATER RUNOFF ALLOWED INTO THE EXCAVATION AREA.
4. REMOVAL OF WATER FROM THE CONSTRUCTION SITE SHALL BE ACCOMPLISHED SO THAT EROSION AND TRANSPORTATION OF SEDIMENT AND OTHER POLLUTANTS ARE MINIMIZED.
5. DISCHARGE DEWATERING EFFLUENT TO AREAS AS INDICATED ON THE SITE GRADING PLAN. DISCHARGE SHALL BE MANAGED TO ENSURE SHEET FLOW.
6. DEWATERING IN PERIODS OF INTENSE HEAVY RAIN OR WHEN THE INFILTRATIVE CAPACITY OF THE SOIL IS EXCEEDED, SHALL BE AVOIDED TO THE MAXIMUM EXTENT PRACTICABLE.
7. FLOW TO THE SEDIMENT REMOVAL STRUCTURE MAY NOT EXCEED THE STRUCTURE'S CAPACITY TO SETTLE AND FILTER FLOW OR THE STRUCTURE'S VOLUME CAPACITY.
8. WHEN TEMPORARY WORKS ARE NO LONGER NEEDED, THE CONTRACTOR SHALL REMOVE AND RETURN THE AREA TO A CONDITION SIMILAR TO THAT WHICH EXISTED BEFORE CONSTRUCTION. AREAS WHERE TEMPORARY WORKS WERE LOCATED SHALL BE GRADED FOR SIGHTLY APPEARANCE WITH NO OBSTRUCTION TO NATURAL SURFACE WATER FLOWS OR THE PROPER FUNCTIONING AND ACCESS TO THE WORKS OF IMPROVEMENTS INSTALLED. THE CONTRACTOR SHALL EXERCISE EXTREME CARE DURING THE REMOVAL STAGES TO MINIMIZE THE LOSS OF SOIL, SEDIMENT AND DEBRIS THAT WAS COLLECTED DURING CONSTRUCTION.



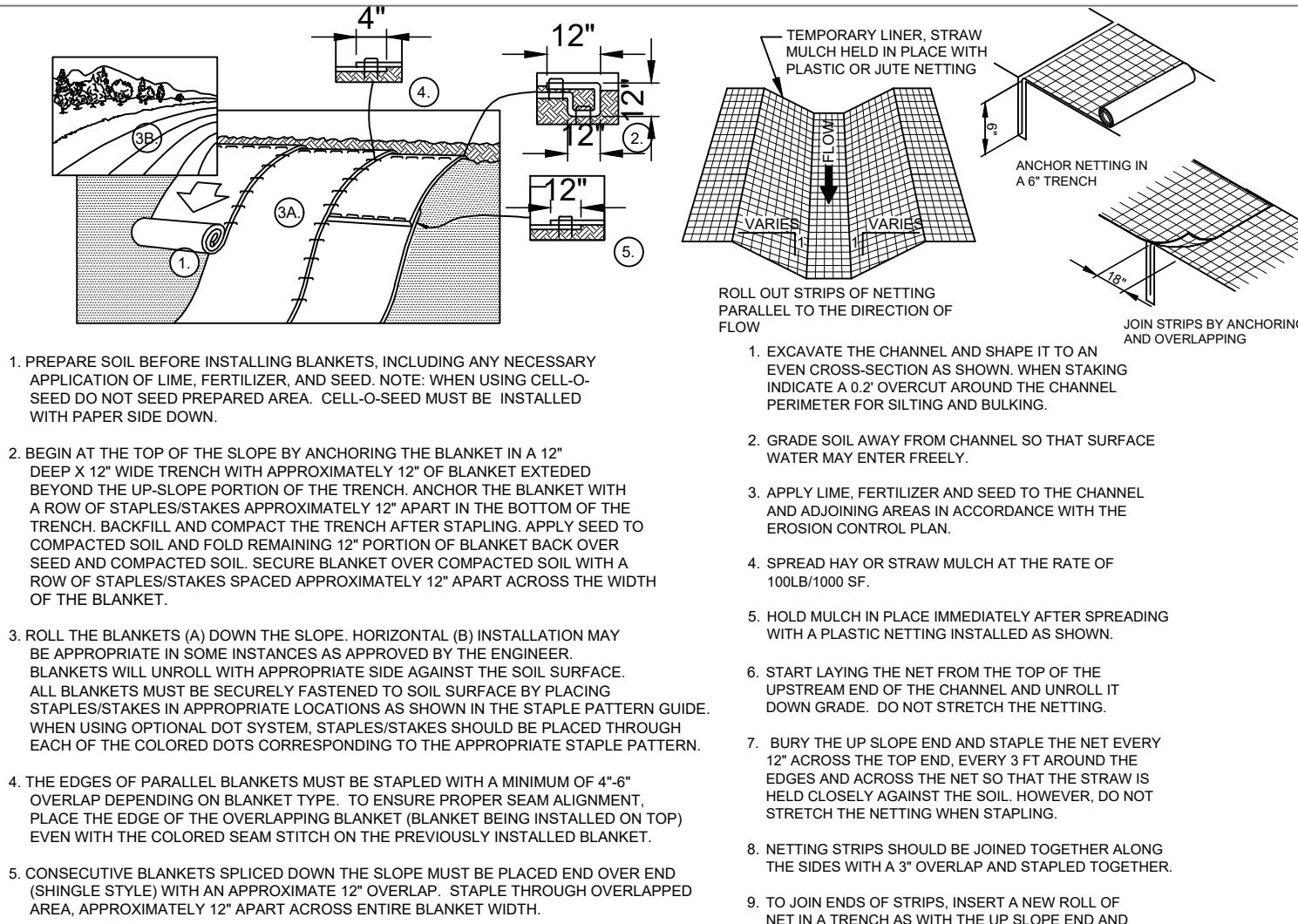
EXCAVATION DEWATERING DETAIL

NOT TO SCALE



STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE

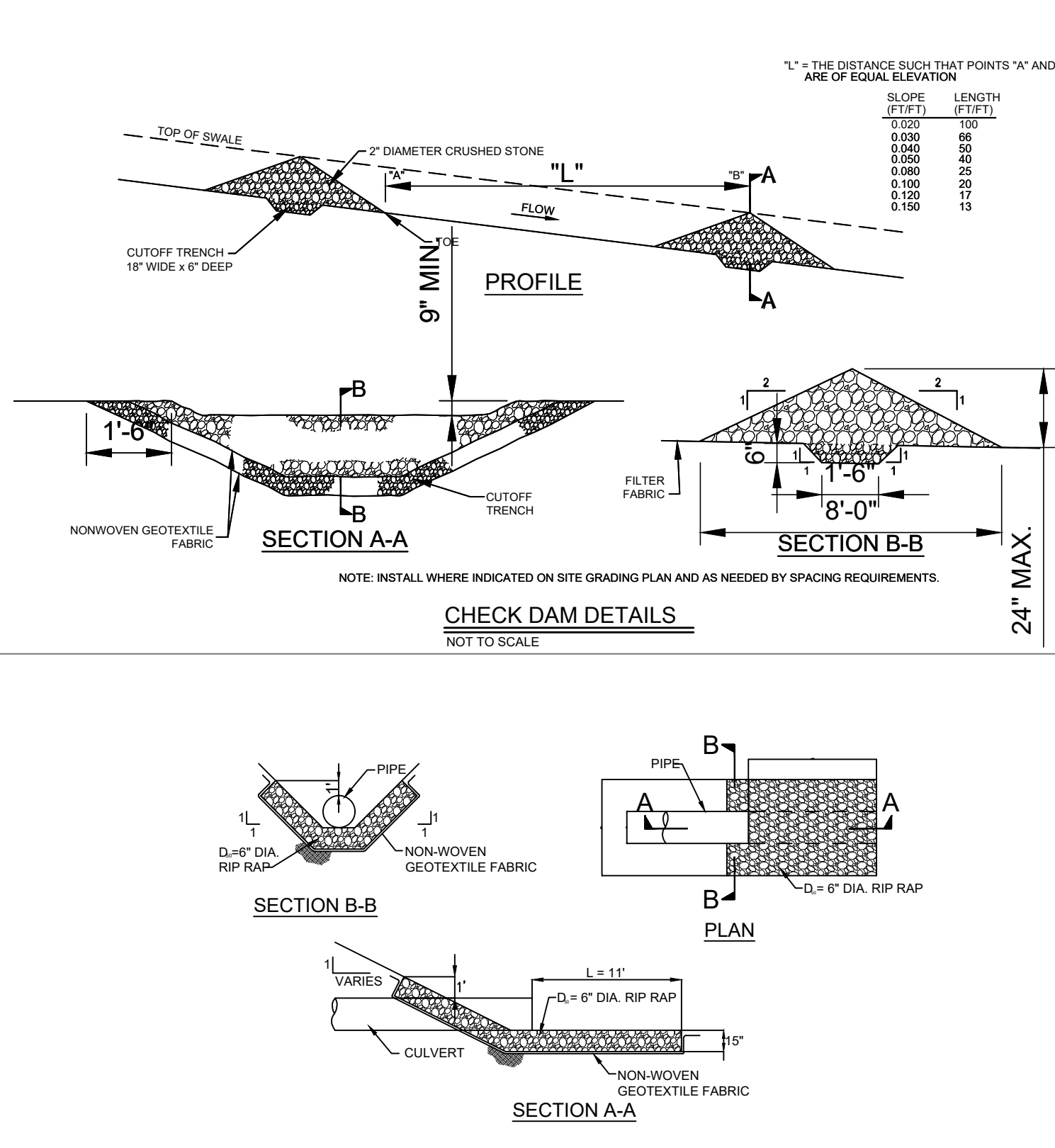


EROSION CONTROL BLANKET

NOT TO SCALE

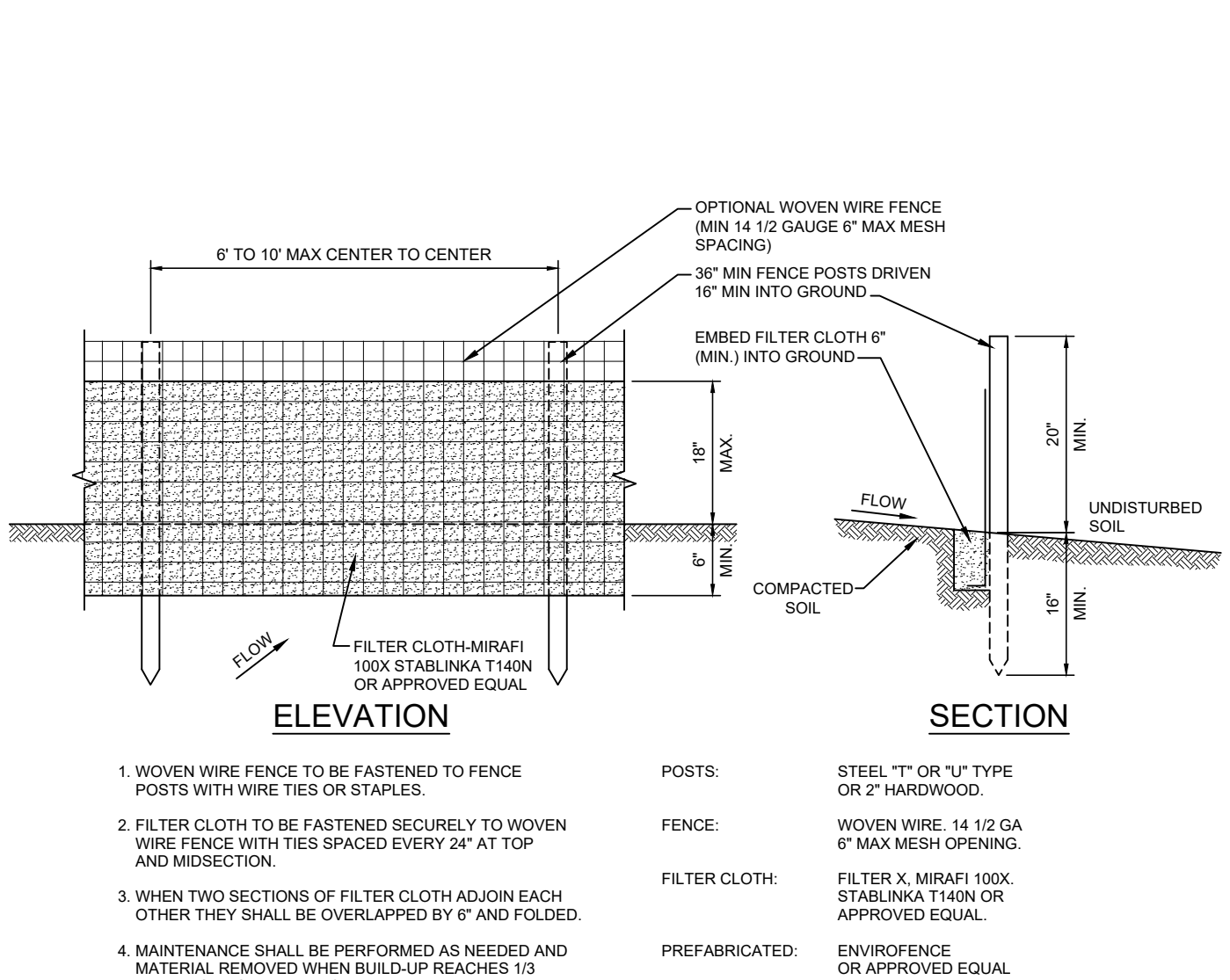
GRASS LINED DITCH

NOT TO SCALE



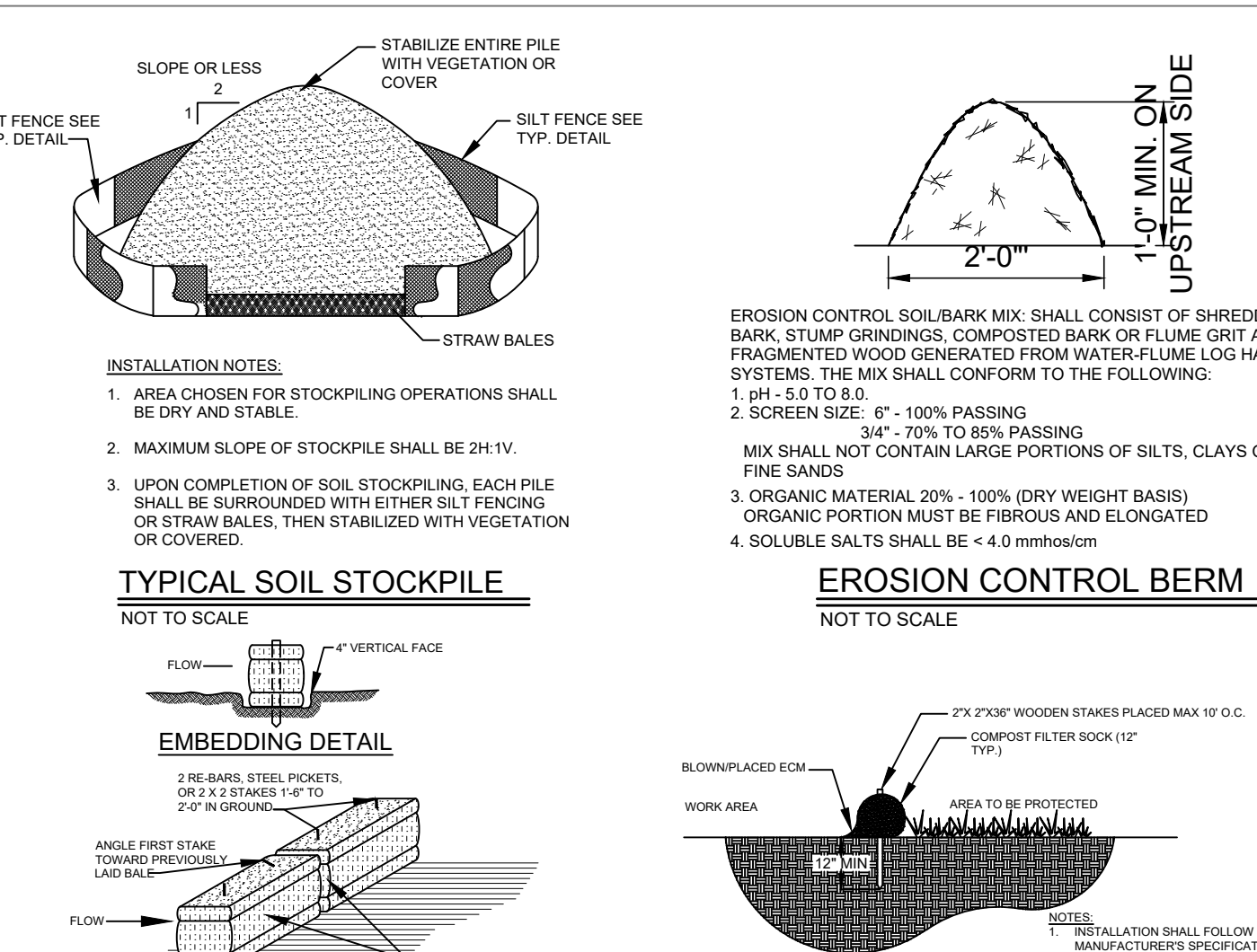
CULVERT INLET/OUTLET PROTECTION

NOT TO SCALE



SILT FENCE DETAILS

NOT TO SCALE

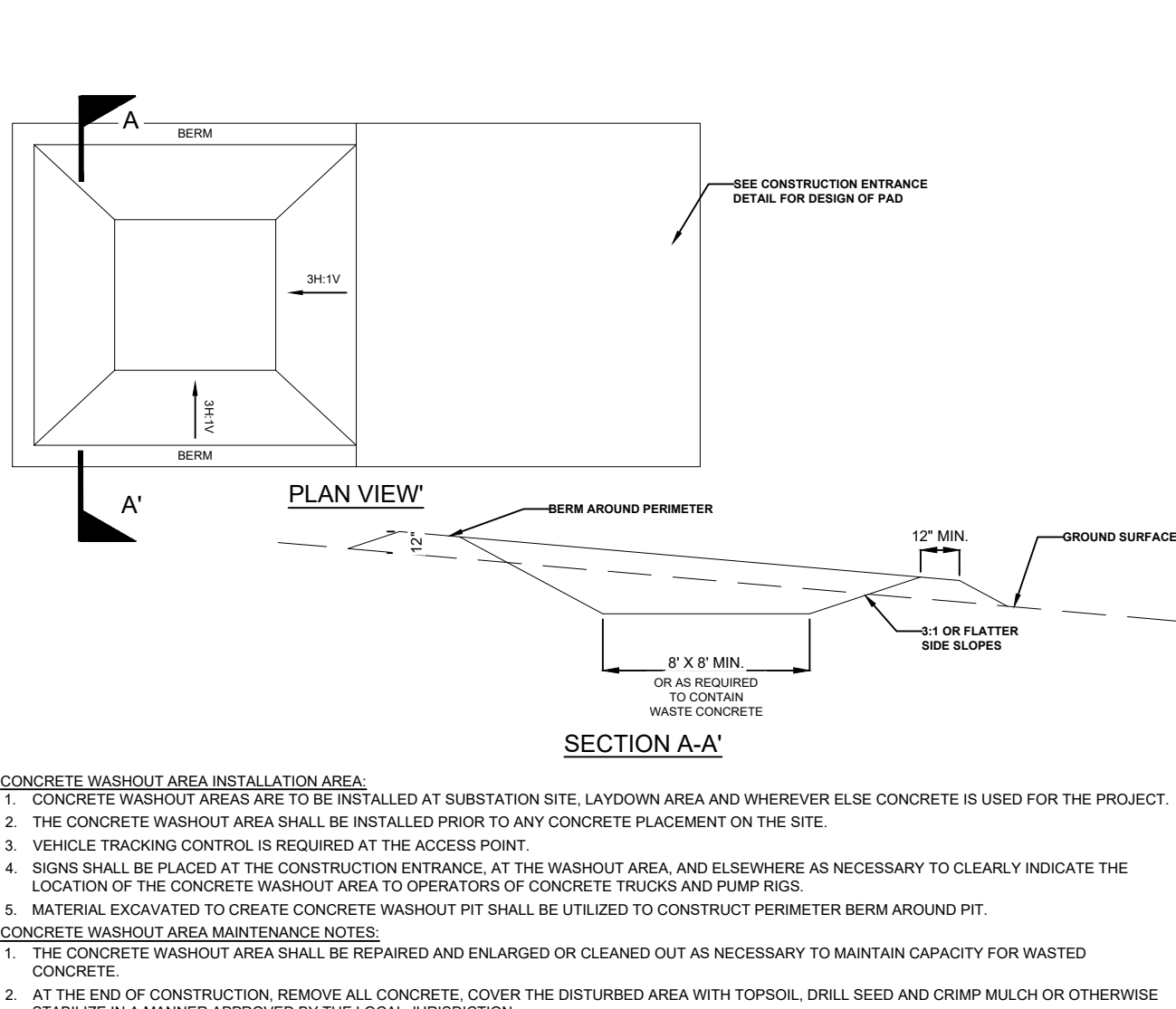
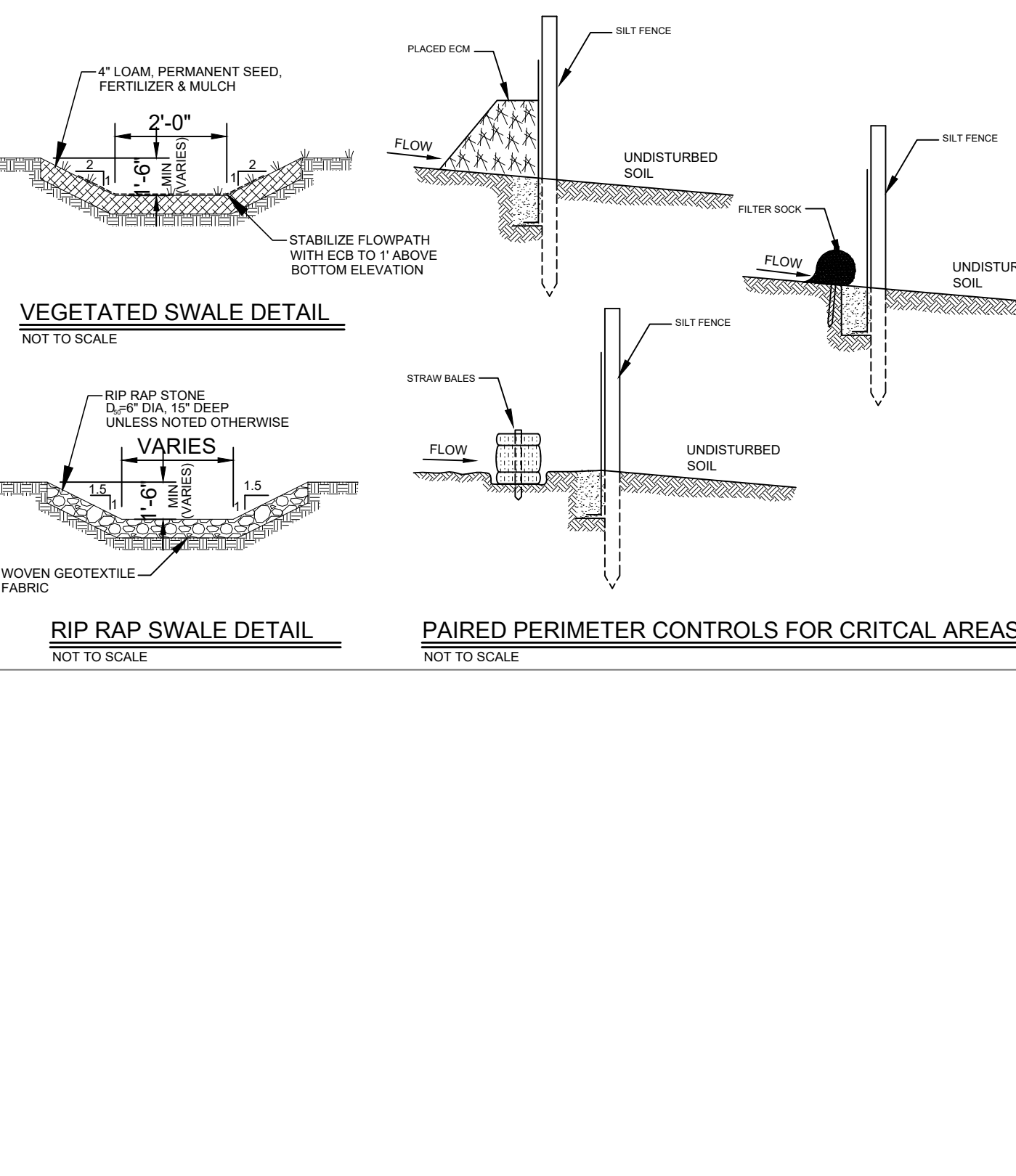


STRAW BALE BARRIER

NOT TO SCALE

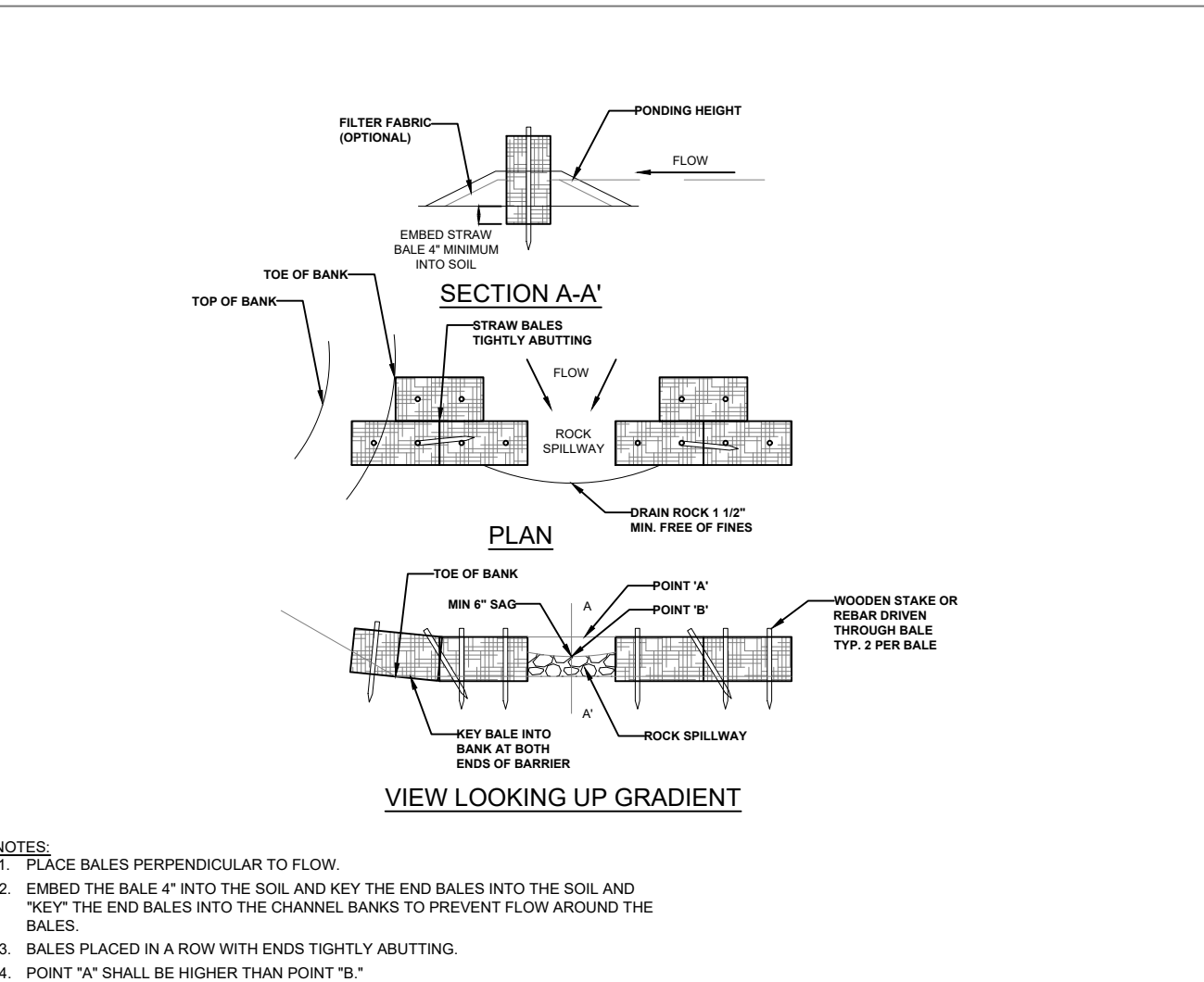
COMPOST FILTER SOCK

NOT TO SCALE



CONCRETE WASHOUT AREA

NOT TO SCALE



SEMI-PERVIOUS SEDIMENT BARRIER

NOT TO SCALE

PERMITTING

NOT FOR CONSTRUCTION

SEAL:		PROFESSIONAL ENGINEER:	
		THOMAS N. DANIELS, JR.	
DATE:		MAY 12, 2020	
PROJECT: SOLAR FIELDS LLC PROPOSED 2MW SOLAR ARRAY 242 MANCHESTER RD, BELGRADE, MAINE			
TITLE: EROSION CONTROL NOTES & DETAILS			
DRAWN BY: TRC/ARD		PROJ. NO.: 389694	
CHECKED BY: TND		G-3	
APPROVED BY: TND			
DATE: MAY 2020			
FILE NO.:		389694-G-SHEETS.dwg	



LEGEND

EXISTING SLOPE EXCEEDS 15%

0 60 120 180 240
SCALE IN FEET

0 60 120 180 240
SCALE IN FEET

PERMITTING
NOT FOR CONSTRUCTION

SEAL:

PROFESSIONAL ENGINEER:
THOMAS N. DANIELS, JR.

DATE:
MAY 12, 2020

01	TRC	5/12/20	ISSUED FOR LOCAL PERMITTING	TND
NO.	BY	DATE	REVISION	APPD.

PROJECT: **SOLAR FIELDS LLC
PROPOSED 2MW SOLAR ARRAY
242 MANCHESTER RD, BELGRADE, MAINE**

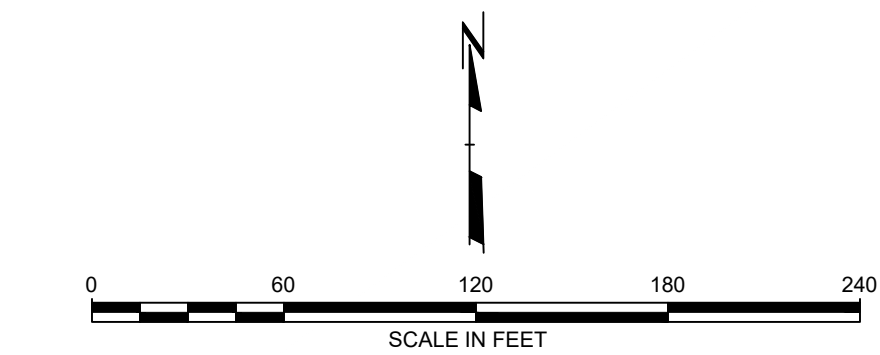
TITLE: **EXISTING CONDITIONS PLAN**

DRAWN BY:	TRC	PROJ. NO.:	389694
CHECKED BY:	TND		
APPROVED BY:	TND		
DATE:	MAY 2020		

TRC

14 Gabriel Drive
Augusta, ME 04330
Phone: 207.620.3800
www.trcsolutions.com

FILE NO.: 389694 - EXISTING_recover.dwg



PERMITTING
NOT FOR CONSTRUCTION



SEAL:	PROFESSIONAL ENGINEER:
	THOMAS N. DANIELS, JR.
	DATE:
	MAY 12, 2020

01	TRC	5/12/20	ISSUED FOR LOCAL PERMITTING	TND
NO.	BY	DATE	REVISION	APPD.

PROJECT: SOLAR FIELDS LLC
PROPOSED 2MW SOLAR ARRAY
242 MANCHESTER RD, BELGRADE, MAINE

TITLE: SITE GRADING & DRAINAGE PLAN

DRAWN BY:	TRC	PROJ. NO.:	389694
CHECKED BY:	TND		
APPROVED BY:	TND		
DATE:	MAY 2020		

14 Gabriel Drive
Augusta, ME 04330
Phone: 207.620.3800
www.trcsolutions.com

FILE NO.: 389694 - BASE-rev01.dwg

Diagram illustrating the fence assembly details. The fence is constructed using a 5'x5' pressure-treated southern yellow pine post, which is chamfered at the top. The fence panel is 6'-0" high. The ground surface is indicated, and the fence is shown to be installed with a minimum depth of 3'-6" below the ground surface.

Technical drawing of a vehicle gate assembly, showing a plan view and a side elevation view.

Plan View (Top):

- Overall width: 20' MIN
- Actual opening: 20' MIN
- Clearance from wall to gate post: 3"
- Gate post: 4" SCH 40 GALVANIZED GATE POST
- Gate material: 2" GALVANIZED WELDED GATE FRAME
- Internal structure: FIXED KNOT, WIRE MESH
- Provision for padlock
- Sign: SIGN IDENTIFYING OWNER AND EMERGENCY CONTACT
- Clearance from wall to gate: 3"
- Clearance from gate to wall: 3"

Side Elevation View (Bottom):

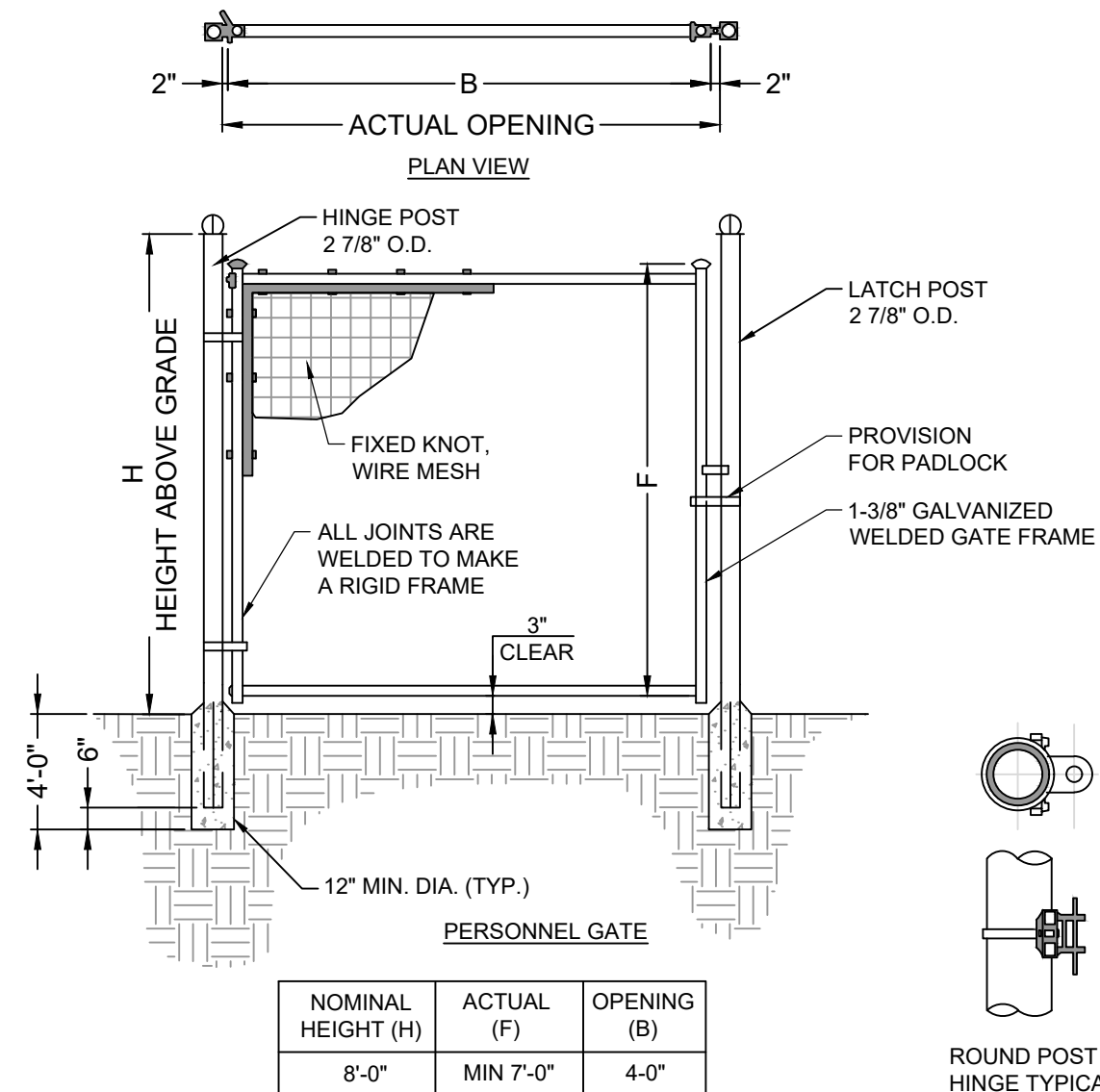
- Height above grade: H
- Gate post height: 4'-0"
- Gate post diameter: 12" MIN. DIA. (TYP.)
- Clearance from ground to gate base: 6"
- Clearance from wall to gate: 3"
- Clearance from gate to wall: 3"
- Label: ALL JOINTS ARE WELDED TO MAKE A RIGID FRAME

Table:

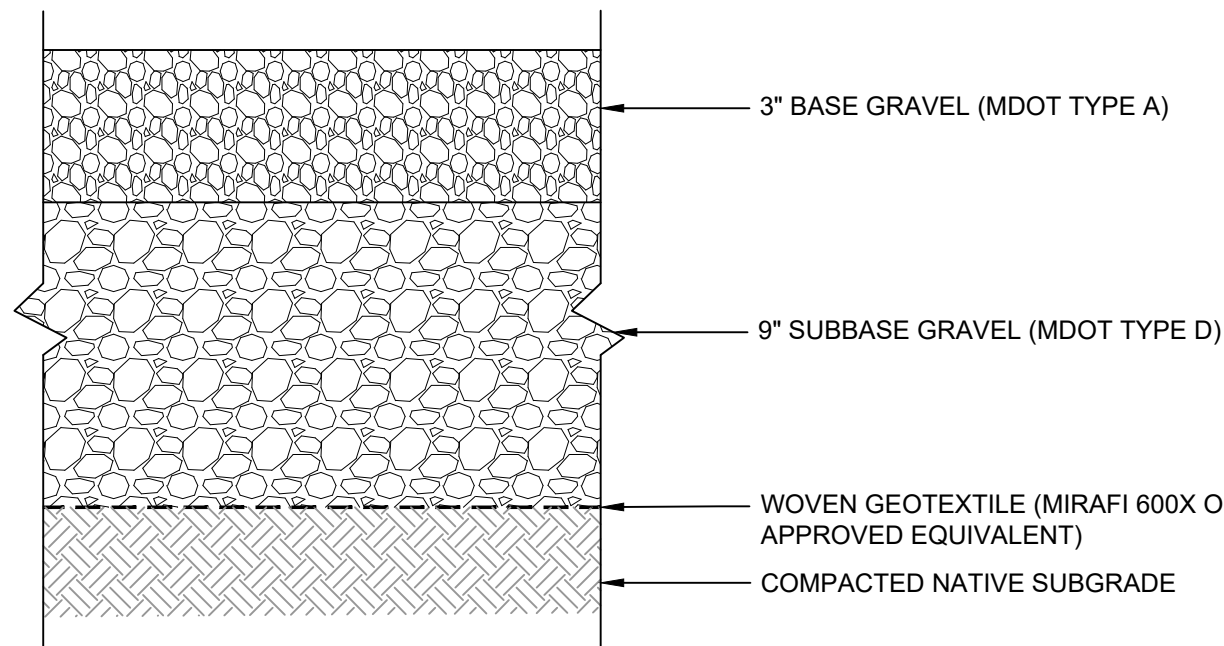
VEHICLE GATE	NOMINAL	ACTUAL	OPENING
--------------	---------	--------	---------

NOT TO SCALE

NOMINAL HEIGHT (H)	ACTUAL (F)	OPENING (B)
8'-0"	MIN 7'-0"	10'-0"

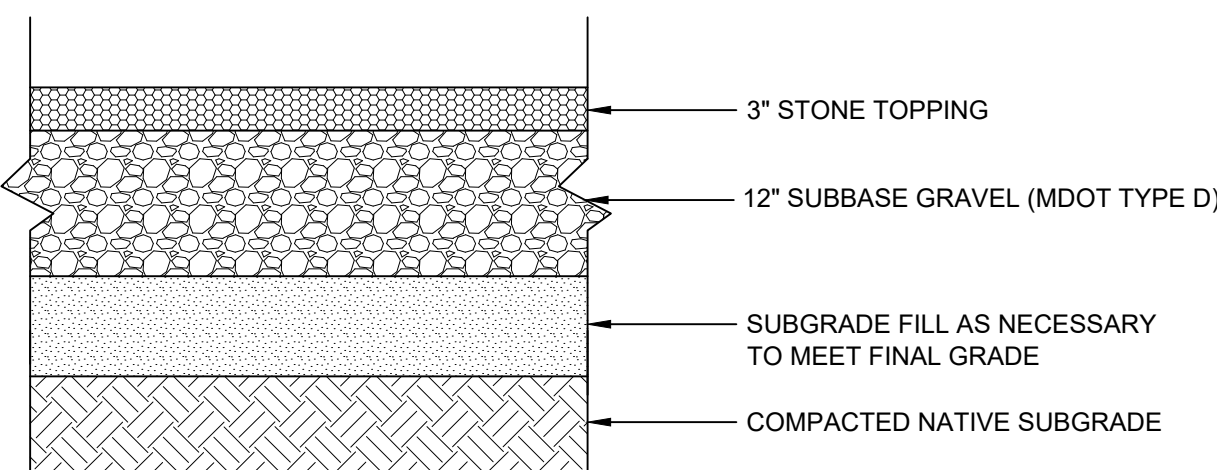


NOT TO SCALE



CONSTRUCTION NOTES:

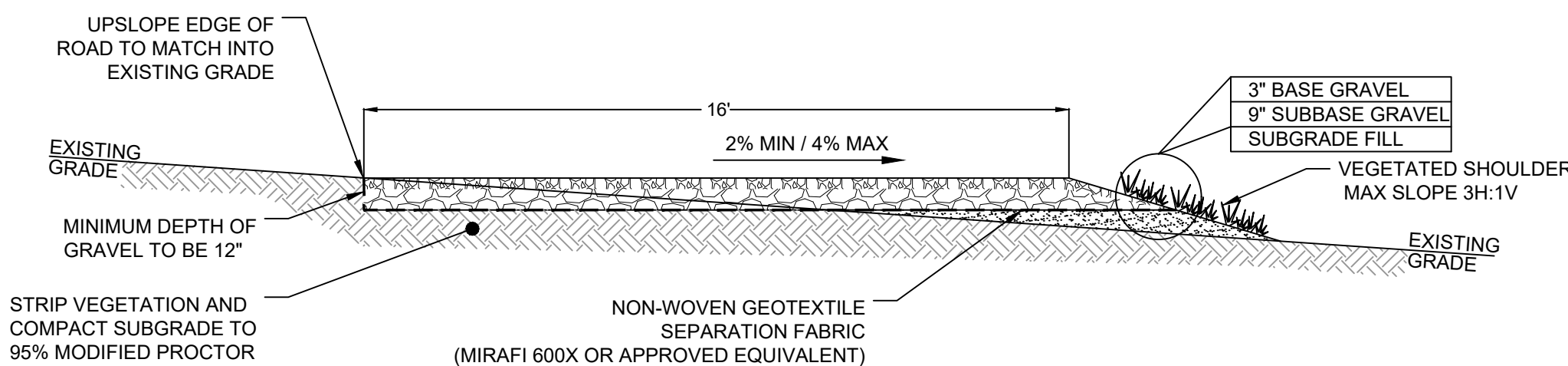
1. BASE AND SUBBASE GRAVEL SHALL CONFORM TO MDOT 703.06. AGGREGATE SHALL BE DURABLE, CRUSHED ROCK CONSISTING OF THE ANGULAR FRAGMENTS OBTAINED BY BREAKING AND CRUSHING SOLID OR SHATTERED NATURAL ROCK, AND FREE FROM, A DETRIMENTAL QUANTITY OF THIN, FLAT, ELONGATED, OR OTHER OBJECTIONABLE PIECES.
2. BASE GRAVEL AND SUBBASE GRAVEL, SHALL BE COMPACTED TO 95% OF ASTM D1557 AND PLACED IN 4" LIFT. EXCESSIVE MOISTURE SHALL BE CORRECTED TO 3% TO 5%.
3. VEGETATION AND TOPSOIL WITHIN LIMIT OF ROAD FILL SHALL BE STRIPPED PRIOR TO PLACEMENT OF SUBGRADE FILL.
4. SUBGRADE SHALL BE COMPACTED TO 95% OF ASTM D1557 TO A DEPTH OF 12-INCHES.



CONSTRUCTION NOTES

1. STONE TOPPING, ASTM C33, SIZE NUMBER 4. CRUSHED STONE TOPPING SHALL BE OBTAINED FROM ROCK OF UNIFORM QUALITY AND CONSIST OF CLEAN, ANGULAR FRAGMENTS OF QUARRIED ROCK, FREE FROM SOFT DISINTEGRATED PIECES OR OBJECTIONABLE MATTER. STONE TOPPING SHALL BE SPECIFIED CRUSHED STONE BLENDED TO BE A 50:50 MIX OF 1-1/2 INCH AND 3/4-INCH STONE. THE FOLLOWING GRADATION IS PROVIDED:
- | SIEVE DESIGNATION | PERCENTAGE BY WEIGHT PASSING SQUARE MESH SIEVES |
|-------------------|---|
| 2 INCH | 100 |
| 1- 1/2 INCH | 90-100 |
| 1 INCH | 20-55 |
| 3/4 INCH | 0-15 |
| 3/8 INCH | 0-5 |
2. SUBBASE GRAVEL SHALL CONFORM TO MDOT 703.06. AGGREGATE SHALL BE DURABLE CRUSHED ROCK CONSISTING OF THE ANGULAR FRAGMENTS OBTAINED BY BREAKING AND CRUSHING SOLID OR SHATTERED NATURAL ROCK, AND FREE FROM A DETRIMENTAL QUANTITY OF DELETERIOUS MATERIALS.
3. VEGETATION SHALL BE STRIPPED FROM FOOTPRINT OF CRUSHED STONE PAD PRIOR TO PLACEMENT OF SUBGRADE FILL.
4. NATIVE SUBGRADE SHALL BE COMPACTED AND PROOF ROLLED PRIOR TO PLACEMENT OF SUBGRADE FILL.

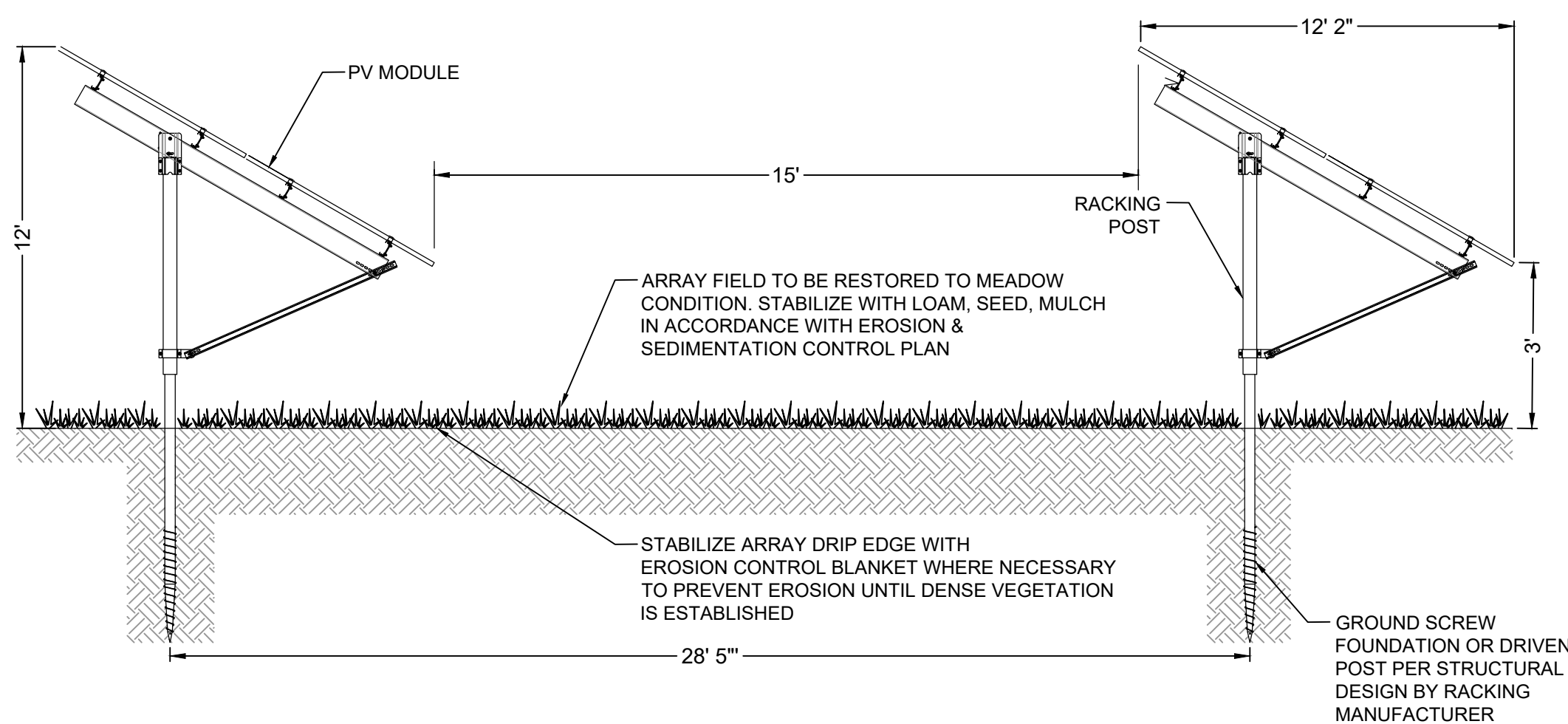
NOT TO SCALE



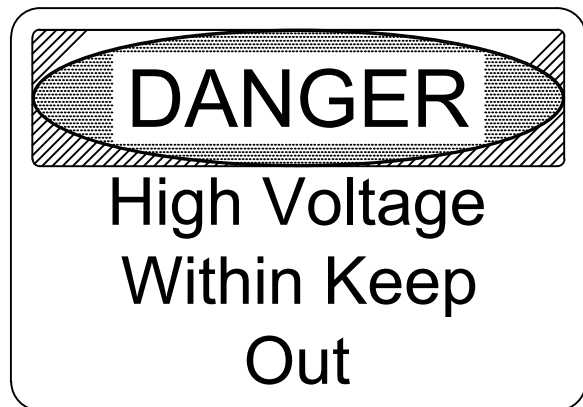
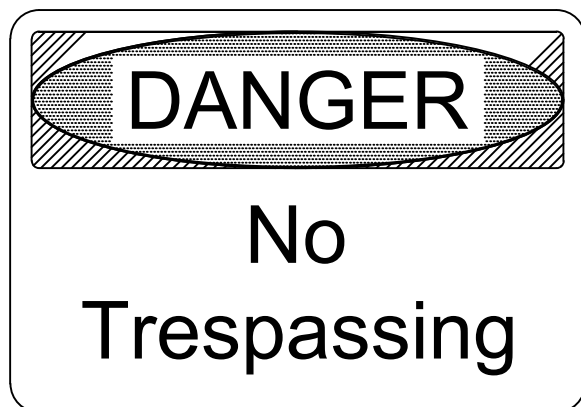
CONSTRUCTION NOTES:

1. SUBGRADE FILL SHALL BE GRANULAR BORROW (MDOT 703.19) OR AS SPECIFIED IN PROJECT GEOTECHNICAL REPORT.
2. GRAVEL SURFACE SHALL BE SUPERELEVATED AND SLOPED A MINIMUM OF 2% AS INDICATED IN PLAN VIEW. CROSS SLOPE SHALL NOT EXCEED 4%.
3. ROADWAY SHOULDER SHALL BE VEGETATED AND PREPARED TO DIRECT RUNOFF AS SHEETFLOW TO IDENTIFIED BUFFER AREAS.

NOT TO SCALE



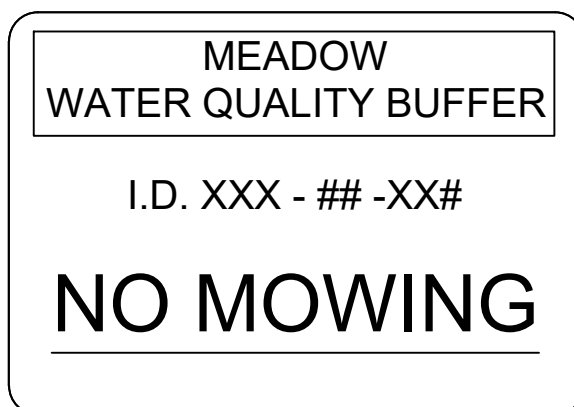
NOT TO SCALE



NOTES

1. SIGNS SHALL CONFORM TO THE 2013 OSHA AND ANSI REQUIREMENTS.
2. SIGNS SHALL BE 20" WIDE BY 14" HIGH.
3. SIGNS SHALL HAVE A MOUNTING HEIGHT OF BETWEEN 45 TO 66 INCHES.
4. SIGN PANELS SHALL BE 10 GAUGE ALUMINUM WITH HIGH VISIBILITY REFLECTIVE SHEETING.
5. SIGNAGE SHALL INCLUDE 24-HR EMERGENCY CONTACT INFORMATION FOR FACILITY OPERATOR.

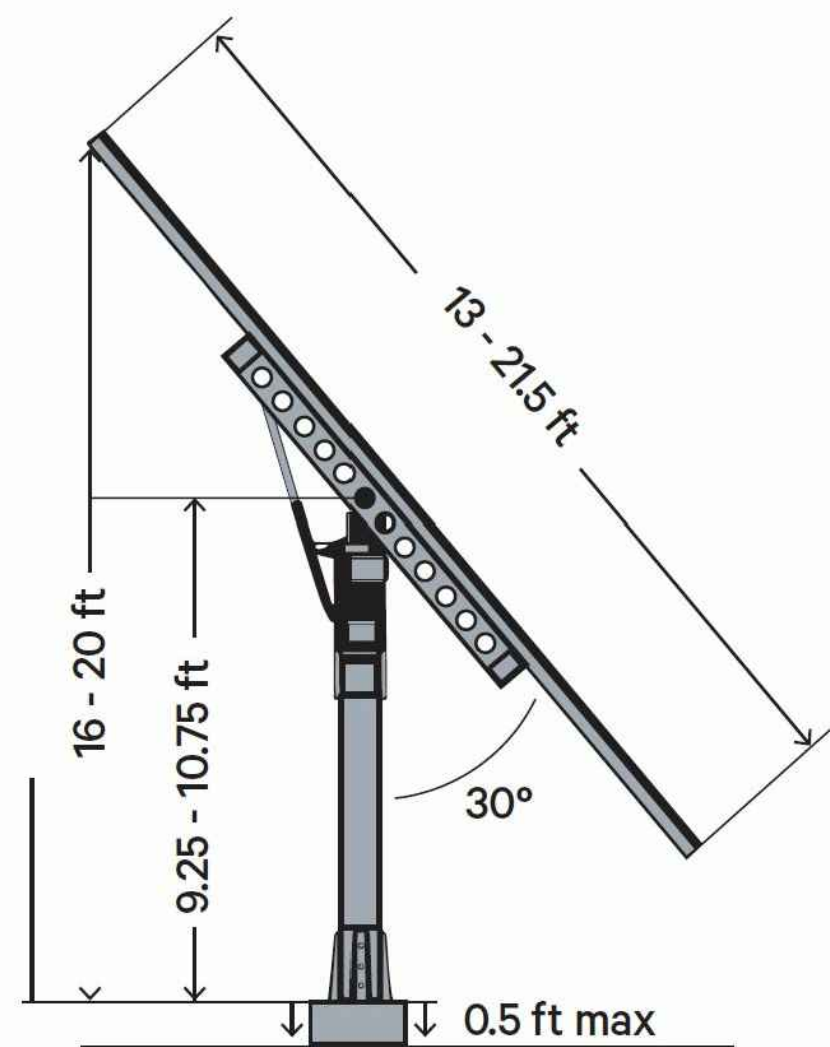
NOT TO SCALE



NOTES

1. WATER QUALITY BUFFERS SHALL BE PERMANENTLY MARKED IN THE FIELD AND REGISTERED WITH THE KENNEBEC COUNTY REGISTRY OF DEEDS.
2. SIGNS SHALL BE 20" WIDE BY 14" HIGH.
3. SIGNS SHALL HAVE A MOUNTING HEIGHT OF BETWEEN 24 TO 48 INCHES.
4. SIGN PANELS SHALL BE 10 GAUGE ALUMINUM OR OTHER APPROVED WEATHER RESISTANT MATERIAL.

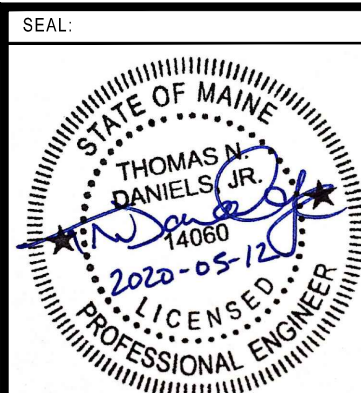
NOT TO SCALE



NOT TO SCALE

NOTES:
1. DETAIL PROVIDED BY ALLEARTH SOLAR OF WILLISTON, VT

NOT FOR CONSTRUCTION



PROFESSIONAL ENGINEER:

THOMAS N. DANIELS, JR.

DATE: _____

MAY 12, 2020

01	TRC	5/12/20	ISSUED FOR LOCAL PERMITTING		TN
NO.	BY	DATE	REVISION		APP

PROJECT: SOLAR FIELDS LLC
PROPOSED 2MW SOLAR ARRAY
242 MANCHESTER RD, BELGRADE, MAINE

CIVIL CONSTRUCTION DETAILS

DRAWN BY:	TRC	PROJ. NO.:	3896
CHECKED BY:	TND	C-3	
APPROVED BY:	TND		
DATE:	MAY 2020		



14 Gabriel Drive
Augusta, ME 04330
Phone: 207.620.3800
www.trcsolutions.com

FILE NO.

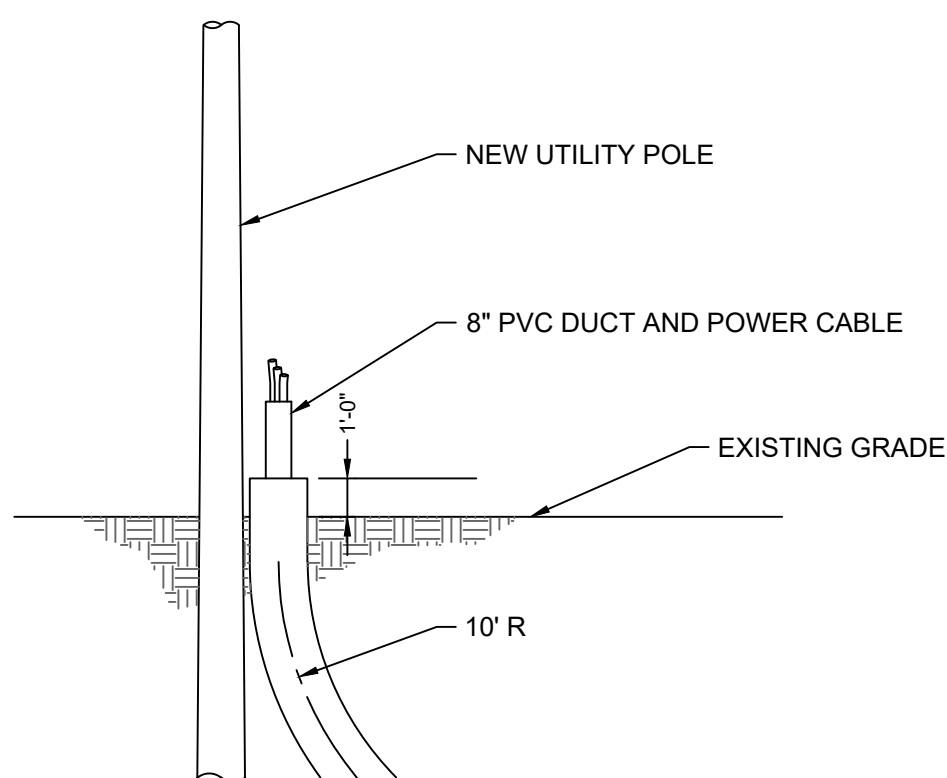
389694 - DT.c

[illegible]

NOT TO SCALE

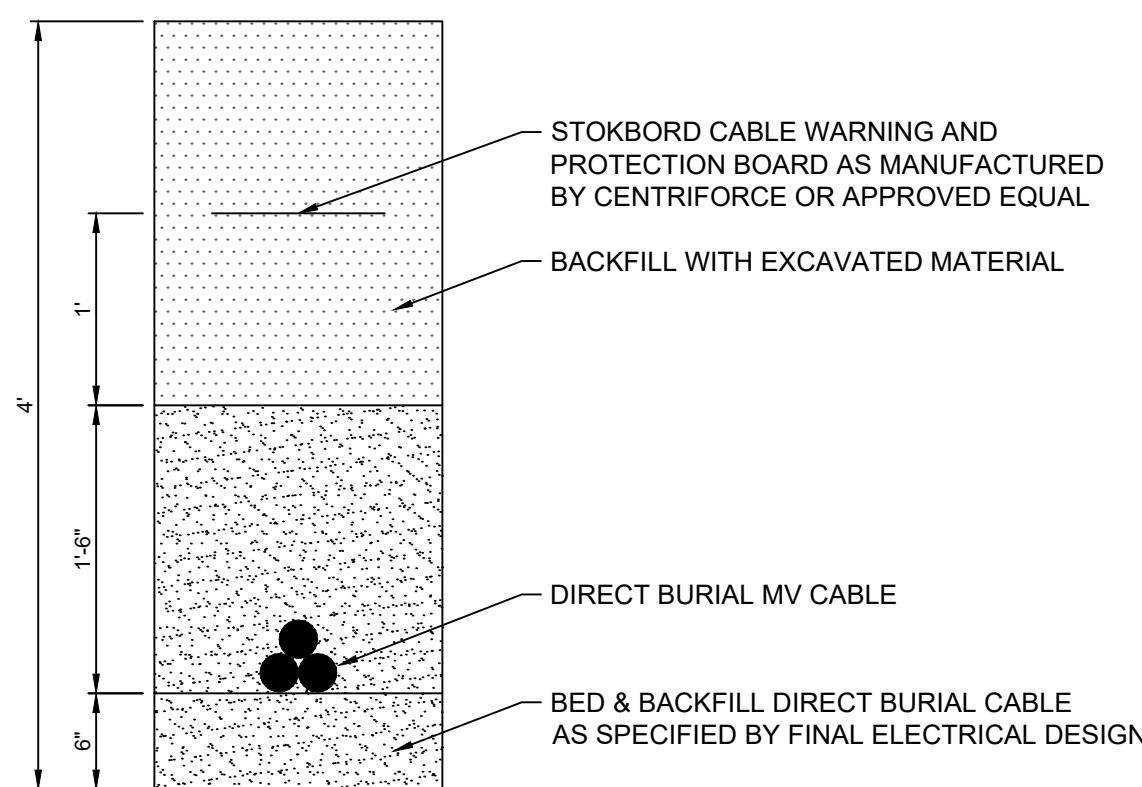
PV MODULE SPECIFICATION SHEET

NOT TO SCALE



UNDERGROUND TO OVERHEAD TRANSITION DETAIL

NOT TO SCALE

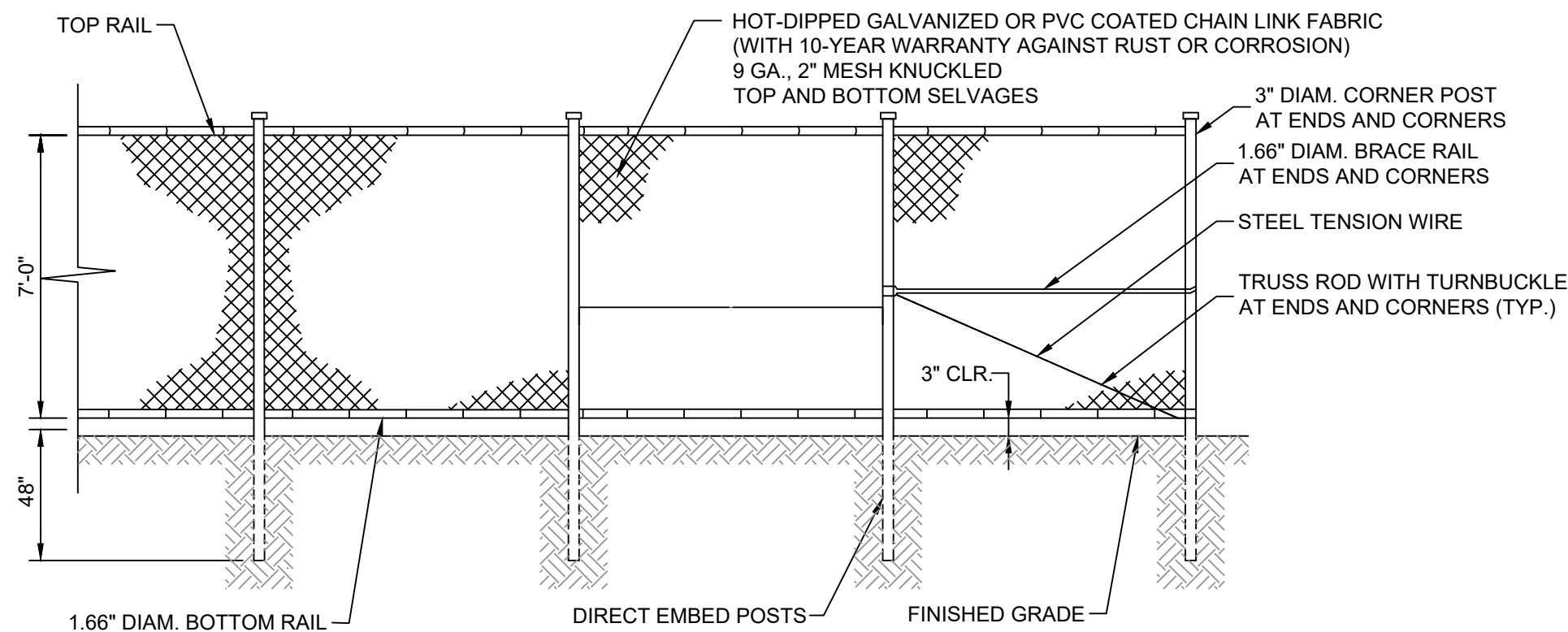


MV UNDERGROUND COLLECTION LINE DETAIL

NOT TO SCALE

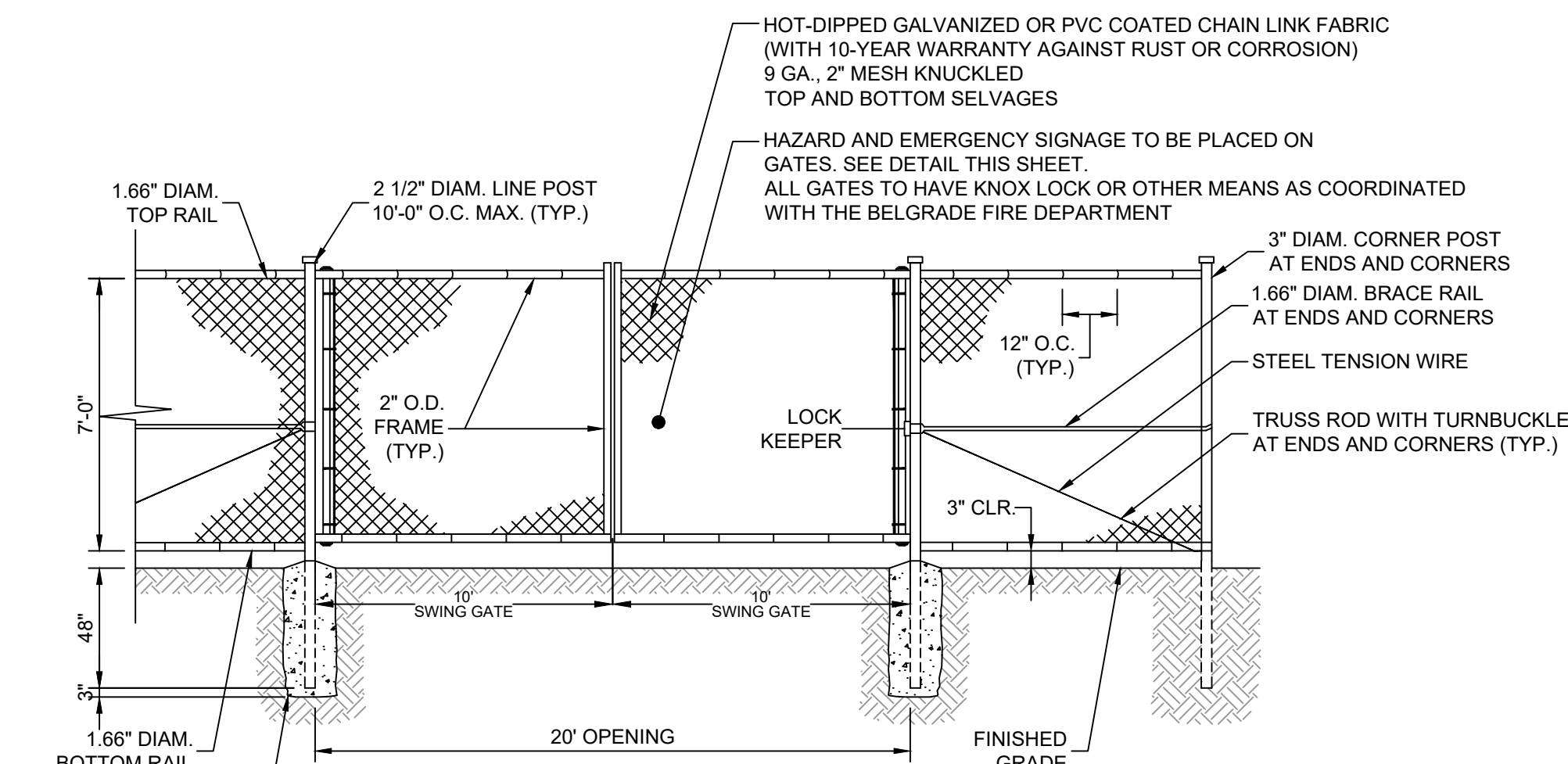
TYPICAL SOLAR ARRAY ISOMETRIC VISUALS

NOT TO SCALE



POWER STATION FENCE DETAIL

NOT TO SCALE



POWER STATION VEHICULAR GATE DETAIL

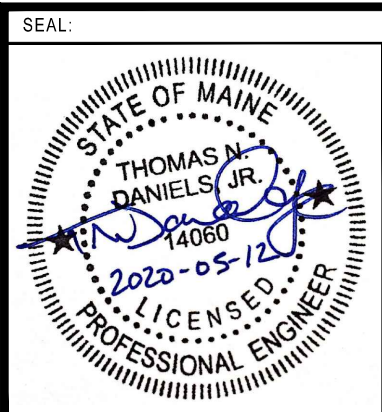
NOT TO SCALE

NOTES

1. DETAILS THIS SHEET ARE FOR CONCEPTUAL AND ILLUSTRATIVE PURPOSES ONLY. FINAL LAYOUT AND CONFIGURATION IS SUBJECT TO DETAILED ENGINEERING DESIGN, INTERCONNECTION AGREEMENT, AND FINAL AHJ APPROVAL.
2. POLE DETAILS ARE DIAGRAMMATIC AND MAY BE CHANGED BASED ON SITE CONDITIONS AND UTILITY REQUIREMENTS.
3. FINAL EQUIPMENT CLEARANCES ARE SUBJECT TO AHJ APPROVAL AND NEC CODE COMPLIANCE.

PERMITTING

NOT FOR CONSTRUCTION



PROFESSIONAL ENGINEER:

THOMAS N. DANIELS, JR.

DATE: _____

MAY 12, 2020

01	TRC	5/12/20	ISSUED FOR LOCAL PERMITTING\	TND
NO.	BY	DATE	REVISION	APP'D.

PROJECT

PROJECT: SOLAR FIELDS LLC
PROPOSED 2MW SOLAR ARRAY
242 MANCHESTER RD, BELGRADE, MAINE

ELECTRICAL DETAILS

DRAWN BY:	TRC	PROJ. NO.:	389694
CHECKED BY:	TND	C-4	
APPROVED BY:	TND		
DATE:	MAY 2020		



14 Gabriel Drive
Augusta, ME 04330
Phone: 207.620.3800
www.trcsolutions.com

FILE NO.

389694 - DT.dwg



LEGEND

ANALYSIS POINT

SUBCATCHMENT

PROPERTY BOUNDARY

TC FLOW PATH

SUBCATCHMENT BOUNDARY

SOILS

SITE SPECIFIC SOILS TABLE

2406 -- USER: Thomas -- ATTACHED: 389694.dwg -- EXISTING: 389694.dwg -- ATTACHED: 389694.dwg -- PLOT DATE: May 12, 2020 - 4:56PM -- LAYOUT: SW-1
DRAWING NAME: \\augusta-01\Environmental\RD\ENV RMD Projects\Solar Fields\389694 - Solar Fields Belgrade, ME\10-DWG\389694 - SW-1.dwg

PERMITTING
NOT FOR CONSTRUCTION

PROFESSIONAL ENGINEER:
THOMAS N. DANIELS, JR.
DATE:
MAY 12, 2020

01	TRC	5/12/20	ISSUED FOR LOCAL PERMITTING	TND
NO.	BY	DATE	REVISION	APPD.

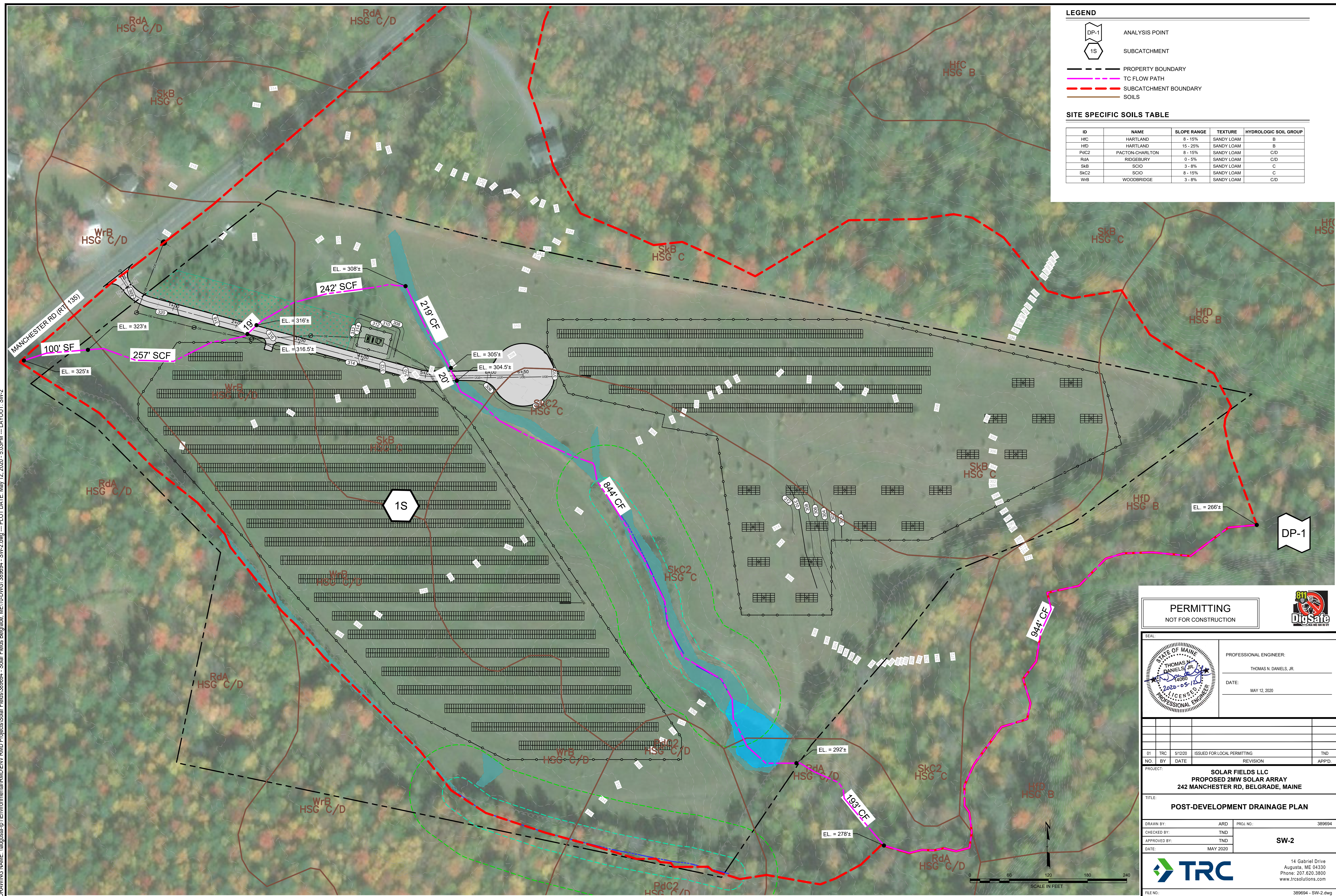
PROJECT: SOLAR FIELDS LLC
PROPOSED 2MW SOLAR ARRAY
242 MANCHESTER RD, BELGRADE, MAINE

TITLE: PRE-DEVELOPMENT DRAINAGE PLAN

DRAWN BY:	ARD	PROJ. NO.:	389694
CHECKED BY:	TND	SW-1	
APPROVED BY:	TND		
DATE:	MAY 2020		

14 Gabriel Drive
Augusta, ME 04330
Phone: 207.620.3800
www.trcsolutions.com

FILE NO.: 389694 - SW-1.dwg



LEGEND

- DP-1: A white pentagon with a black border and the text "DP-1" inside.
- 1S: A white hexagon with a black border and the text "1S" inside.
- PROPERTY BOUNDARY: A solid black line.
- TC FLOW PATH: A dashed magenta line.
- SUBCATCHMENT BOUNDARY: A dashed red line.
- SOILS: A solid brown line.

Belgrade Fire & Rescue

990 Augusta Road
Belgrade, Maine 04917
207 495-7739



Daniel MacKenzie Chief
446-0603
William Pulsifer, Deputy Chief
495-3855

Regarding construction of a new 2.0 MWAC solar array located at 242 Manchester road in Belgrade. Belgrade Fire Department with the mutual aid system that is currently established has the capacity to provide adequate protection for the town with this construction plan. Belgrade Fire Department and the Town of Belgrade will require with this construction project the following.

- Adequate training for the fire/ rescue department paid for by Solar Fields, LLC on the policies and procedures associated with emergency situations including fires which may arise within the boundaries of the solar panel facility.
- Adequate accessibility to and around the solar panel facility with security gates to the back and sides of each gated area to reach the adjacent properties in case of fire spread. The gated openings should be 10' to allow access of our brush truck. The gated areas are to be equipped with a knox box.
- If feasible and enough water a dry hydrant to be installed at the water source on the property.
- A final walk through with the Belgrade Fire Department after the job is complete.

Sincerely

Dan MacKenzie

Fire Chief

Belgrade Fire Department

Edward Ketch, Jr.,
Assistant Chief
Belgrade Lakes
242-7727

Bruce Galouch
Assistant Chief
Belgrade Depot
458-1300

Scott Damren
Assistant Chief
North Belgrade
465-5191

Travis Burton
Rescue Chief
Belgrade Rescue
458-3191



Stormwater Management Report

May 2020



Reviewed and Approved by: Thomas N. Daniels, Jr, PE

**Solar Fields
2.0 MW Solar Array
Manchester Road (Rt. 135)
Belgrade, Maine**

Prepared For:

Solar Fields, LLC
376 West Road
Belgrade, ME 04917

Prepared By:

TRC Companies, Inc.
14 Gabriel Drive
Augusta, ME 04330



TABLE OF CONTENTS

1.0	PROJECT NARRATIVE	1
1.1	Project Location	1
1.2	Surface Water On or Abutting the Site.....	1
1.3	Downstream Waterbodies.....	1
1.4	General Topography	1
1.5	Flood Plain	2
1.6	Alterations to Natural Drainage Ways.....	2
1.7	Alterations to Land Cover Within Watershed.....	2
2.0	MAPS.....	3
2.1	Topographic Site Maps	3
2.2	Site Specific Soils Mapping.....	3
3.0	DRAINAGE PLANS.....	3
4.0	RUNOFF ANALYSIS.....	3
4.1	Precipitation	4
4.2	Runoff Curve Numbers	4
4.3	Time of Concentration Calculations	4
5.0	STORMWATER QUANTITY TREATMENT PLAN – FLOODING STANDARD	5
5.1	Peak Discharge Calculations	5
5.2	Variance Submissions	5
5.3	Calculations for the Sizing of Proposed Culverts and Stormwater Basins	5
5.4	Infiltration Systems.....	6
5.5	Drainage Easement Declarations	6
6.0	STORMWATER QUALITY – PHOSPHORUS CONTROL PLAN	6
6.1	Watershed Per-Acre Phosphorus Allocation	6
6.2	Project Phosphorus Budget	6
6.3	Project Phosphorus Export	7
6.4	Phosphorus Control Measures	7
6.5	Engineering Inspection for Stormwater Management Facilities	7
7.0	EROSION & SEDIMENTATION CONTROL – BASIC STANDARDS.....	8
7.1	Project Schedule.....	8
7.2	Erosion and Sediment Control Measures	8
7.2.1	Temporary Measures	9
7.2.2	Permanent Measures.....	11
7.2.3	Erosion Control Measure Removal.....	13
7.3	Overwinter Construction	13
7.4	Housekeeping	14
7.5	Inspection & Maintenance.....	15
7.6	Erosion & Sedimentation Control Conclusion.....	15

8.0	POST-CONSTRUCTION STORMWATER MAINTENANCE PLAN.....	15
8.1	Facilities to be Maintained	15
8.2	General Inspection and Maintenance Requirements.....	16
8.3	Access Roadway.....	16
8.4	Culverts	16
8.5	Vegetated Buffers	16
8.6	Revegetated Areas and Embankments	16
8.7	Re-certification	16
9.0	CERTIFICATION – PROFESSIONAL ENGINEER	18

ATTACHMENTS

Attachment A – Figures & Maps

Attachment B – Stormwater Calculations

Attachment C – Construction and Post-Construction Stormwater Inspection & Maintenance Log
Examples

Attachment D – Example Stormwater Buffer Deed Restriction

ACRONYMS

BMP	Best Management Practice
cfs	Cubic feet per second
CN	Runoff curve number
CPESC	Certified Professional in Erosion and Sedimentation Control
ECB	Erosion Control Blanket
ECM	Erosion Control Mix
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
fps	Feet per second
HSG	Hydrologic Soil Group
MDEP	Maine Department of Environmental Protection
NRCS	Natural Resources Conservation Service
PE	Professional Engineer
Project	Solar Fields Solar Project
Tc	Time of Concentration
USDA-SCS	United States Department of Agriculture Soil Conservation Service

1.0 Project Narrative

This Stormwater Management Report is provided to describe and quantify the pre- and post-development hydrology of the area to be impacted by the construction of the Solar Fields 2.0 MW_{AC} Solar Array Project (the Project) and to demonstrate that the proposed development will comply with the applicable Maine Department of Environmental Protection (MDEP) stormwater management requirements prescribed in Chapter 500 as well as the requirements of the Town of Belgrade Commercial Development Review Ordinance.

1.1 Project Location

The proposed ground-mounted photovoltaic solar module system will be constructed on portions of an approximately 24.9-acre parcel of land located off Manchester Road (Route 135) in the town of Belgrade, Maine. The parcel is comprised of approximately 21-acres of open fields historically used for a variety of agricultural uses, most notable a Christmas Tree farm from approximately 1966 to 2011, which have eventually returned to fallow un-grazed fields that are mowed periodically. The remainder of the parcel is wooded and undeveloped lands. Land use of abutting properties consist of single-family residences along the Manchester Road corridor and undeveloped wooded lands south, north, and east of the Project parcel.

1.2 Surface Water On or Abutting the Site

Natural resource surveys were conducted by Burman Land & Tree Company, LLC of Orrington, ME in April of 2020 to identify potential streams, wetlands, vernal pools, or other sensitive environmental receptors adjacent to or within the Project Area. A drainage swale traverses the Project parcel diagonally in a southeasterly direction. Wetland areas, and a section of intermittent stream were delineated coincident with this drainage feature until terminating at an excavated farm pond located near the southeast corner of the parcel. Other wetlands areas were delineated along the southern edge of the field where it meets the woodline. Location of delineated natural resources are shown in the civil design drawing package.

1.3 Downstream Waterbodies

Runoff from the Project Area drains southerly to a variety of non-jurisdictional drainages, intermittent streams, and unnamed tributaries eventually converging to Belgrade Stream and on to Messalonskee Lake which is identified by MDEP as a “Lake Most at Risk from New Development” as defined in Chapter 502.

1.4 General Topography

Two-foot contours for the entire Project Area were generated from LiDAR data provided by the Maine Office of GIS. Existing topography within the proposed development area slopes to the interior of the parcel to a drainage swale that traverses the site diagonally in a southeasterly direction. The majority of runoff is routed through a former farm pond prior to discharging offsite. Existing topography is well suited for solar development and is generally less than 15% in slope. Under post-development conditions, site drainage will generally remain the same with the exception of localized grading to conform the site to array racking tolerances and maintain positive drainage and prevent ponding within the proposed array area. Mass import or export of earthen materials is not anticipated. The access road will be graded to promote runoff from impervious

surfaces to existing vegetated areas as sheet flow. Construction and implementation of new stormwater conveyances that would result in discharging concentrated flows are not proposed. Overall the proposed site design gives preference to the natural drainage patterns and was developed to promote sheet flow over vegetated areas.

1.5 Flood Plain

The Federal Emergency Management Authority (FEMA) maintains materials developed to support flood hazard mapping for the National Flood Insurance Program (NFIP). The Project Area does not contain any land designated within a 100-year flood zone according to the Flood Insurance Rate Map (FIRM) for the Town of Belgrade, panel number 23011C0330D, revised date of June 16, 2011 (See **Attachment A**).

1.6 Alterations to Natural Drainage Ways

Construction of the proposed Project will not significantly alter natural drainage ways. A gravel access road will extend from Manchester Road to the eastern portion of the array and cross an existing drainage swale. Alignment of the proposed access road was designed to cross this feature in the location of an existing culverted fill to avoid wetland or natural resource impacts. The Project design includes accommodations to upgrade this culvert for improved hydraulic performance and installation of a culvert at the access road entrance. Calculations supporting the culverts are further described in section 5.3 below.

1.7 Alterations to Land Cover Within Watershed

The location of the proposed development currently consists of an ungrazed meadowed field. The overall watershed delineated for the Project Area also encompasses adjacent wooded areas and a single-family residence to the north of the property.

Under proposed development conditions, alterations to land cover includes the addition of gravel surfaces for the proposed access road, placement of an impervious concrete pad on a crushed stone pad for electrical equipment, and installing the solar array over the meadowed field. Ground disturbance will be minimized as much as possible and will only occur in areas necessary for installation of the proposed access road, array racking posts, equipment pad, and underground electrical conduit runs. Disturbed areas will be revegetated to further improve post-construction ground cover.

New impervious surfaces associated with the proposed development consist of the gravel access road, post-supported racking system, and equipment pad. The solar panels themselves are not considered an impervious surface with respect to stormwater runoff as they are elevated above grade. Separation between rows of panels will allow the passage of precipitation to the ground surface. The array racking posts are anticipated to consist of either steel beams (W6x8.5) with an area of approximately 2.52 square inches each or approximately 3-inch diameter ground screw foundations. Array racking requires a post approximately every 13 feet for fixed-tilt arrays. Impervious surfaces associated with the array posts are considered de minimis and negligible in terms of providing stormwater quality treatment.

Impervious surfaces within the watershed have been increased by approximately 19,375 square feet. This is due to the proposed gravel access road and equipment pad. The table below provides

a summary of land cover changes as represented by the composite runoff curve numbers (CNs) within the assessed watershed:

LAND COVER CHANGES				
SUBCATCHMENT ID	PRE-DEVELOPMENT CONDITIONS		POST-DEVELOPMENT CONDITIONS	
	CN	AREA (Ac.)	CN	AREA (Ac.)
1S	71.8	31.8	72.1	31.8

As shown in the table, changes to the land cover between pre- and post-development conditions within the delineated watershed are minimal with only a small increase in the composite CNs. A summary of the land cover types and CNs for the pre- and post-development subcatchment are provided in **Attachment B**.

2.0 Maps

2.1 Topographic Site Maps

A map of the Project boundaries overlaid on a USGS 7.5-minute topographic quadrangle map is included as **Figure 1** in **Attachment A**.

2.2 Site Specific Soils Mapping

Published NRCS soils data and mapping were utilized to support the hydrologic assessment of the Project Area. The NRCS data was used as the primary source for soils information in determining appropriate runoff curve numbers (CN) used in the runoff analysis. The hydrologic soil groups (HSGs) within the subcatchments included in the study areas are shown on the Pre- and Post-Development Watershed Plans, drawing sheets SW-1 and SW-2 respectively.

3.0 Drainage Plans

The Pre-Development Drainage Plan and the Post-Development Drainage Plan for the proposed Project are included with the Issued For Permitting drawing set. Both plans include two-foot contours, land cover types, HSGs, subcatchment boundaries and analysis points, hydrologic flow lines, existing features, and drainage ways where applicable. The Post-Development Drainage Plans include the locations of proposed roads, structures, and applicable stormwater management features.

4.0 Runoff Analysis

Stormwater runoff was estimated using HydroCAD, Version 10.0. HydroCAD software is based on methodologies developed by the United States Department of Agriculture Soil Conservation Service (USDA-SCS¹), namely *Urban Hydrology for Small Watersheds*, Technical Release 55 and Technical Release 20 (TR-55 and TR-20), in combination with other hydraulic and hydrologic calculations. Based on site specific information including subcatchment area and slopes, HSGs,

¹ Now known as the Natural Resource Conservation Service (NRCS)

land cover types, and rainfall data, the program estimates inflow and outflow hydrographs for each subcatchment and performs reach and pond routing calculations. The pre- and post-development runoff analysis calculations are provided in **Attachment B**.

The hydrologic analysis for this project consists of delineating a single subcatchment for both pre- and post-development conditions which contribute runoff to a single analysis point. The subcatchment boundary was determined from the existing and proposed contours. Runoff from the subcatchment was analyzed at the point of intersection of the respective longest hydrologic flow paths and either a subcatchment boundary, stormwater conveyance or Project Area boundary. The intent of the hydrologic analysis is to demonstrate that the changes in ground cover resulting from the Project will not adversely affect downgradient properties or natural resources. Relevant design information is shown on the Pre- and Post-development Drainage Plans, SW-1 and SW-2 respectively.

4.1 Precipitation

Design storms modeled for the pre- and post-development runoff analyses are based on the information provided in Chapter 500, Appendix H – *24-hour duration rainfalls for various return periods* for Kennebec County. Precipitation events with a 24-hour duration having a Type III distribution with return periods of 2-, 10-, 25-, and 100-years. Rainfall depths for these events are 2.8, 4.2, 5.2, and 7.2 inches respectively.

4.2 Runoff Curve Numbers

A summary of the land cover types, hydrologic soil groups (HSGs), and runoff curve numbers (CNs) for the pre- and post-development subcatchments are provided in the stormwater calculation package in **Attachment B**. Cover types for the impacted areas were determined from the natural resource field surveys, a site visit, and publicly available aerial imagery.

The soil types and HSG information for the Project Study Area are based on NRCS soil maps. The HSGs within the runoff analysis areas are shown on the Pre- and Post-Development Watershed Plans (**Attachment A**).

The CNs were selected from HydroCAD software which incorporates a complete curve number lookup table based on the data developed by the NRCS and published in TR-55, based on the observed cover types and hydrologic soil groups.

4.3 Time of Concentration Calculations

Times of concentration were calculated using NRCS TR-55 methodologies considering the hydrologic flow lengths, slope, land cover type, and surface roughness. The type and length of each flow line segment determining travel times in the area to be developed are indicated on the pre- and post-development drainage plans. A maximum sheet flow length of 100 feet was used for this analysis. Shallow concentrated flow was used for portions of the flow path beyond 100 feet extending until a channel, culvert, or subcatchment boundary was encountered. For each subcatchment, the travel times were summed to determine the time of concentration, which was then input directly into HydroCAD. The calculation spreadsheets are included with the calculations in **Attachment B**.

5.0 Stormwater Quantity Treatment Plan – Flooding Standard

5.1 Peak Discharge Calculations

Peak discharge calculations are included in the HydroCAD output. A single analysis point was assessed under both pre- and post-development conditions. Results of the pre- and post-development runoff analyses are shown and compared in the table below.

ANALYSIS POINT: DP-1				
DESIGN STORM	PRE-DEVELOPMENT		POST-DEVELOPMENT	
	RUNOFF VOL. (AF)	RUNOFF RATE (cfs)	RUNOFF VOL. (AF)	RUNOFF RATE (cfs)
2-Year, 24-hour	1.834	9.30	1.834	9.37
10-Year, 24-hour	4.246	23.80	4.246	23.95
25-Year, 24-hour	6.237	35.68	6.237	35.98
100-Year, 24-hour	10.603	61.32	10.603	61.91

The analyses demonstrate that peak volumes and rates of runoff under post-development conditions are almost identical to pre-development conditions for the assessed watershed. The peak volumes remain constant and there is a minimal difference between the peak runoff rates but the difference is less than 1 percent. These results are due to the minimal changes in land cover in the proposed post development conditions and a negligible increase in impervious area.

5.2 Variance Submissions

A variance from the peak flow standard is not necessary for the Project. The proposed plan of development generally maintains existing hydrology and drainage patterns and will not adversely affect downstream properties.

5.3 Calculations for the Sizing of Proposed Culverts and Stormwater Basins

Stormwater basins are not required for runoff treatment or attenuation; however, the Project will include the installation of two new culverts, one at the access road entrance and one to replace an existing culvert at a swale crossing. The culvert at the swale crossing conveys flows from an existing drainage swale and will allow the proposed access road to cross the drainage swale with limited impacts to wetlands and natural resources. The following table provides a summary of the proposed culverts. Calculations supporting the sizing of the culverts are provided in the Post-Development HydroCAD model included in **Attachment B**.

CULVERT SUMMARY				
CULVERT ID	DRAINAGE AREA (AC.)	CULVERT DIA (IN.)	PEAK FLOW RATE (CFS) 25-YR STORM	DISCHARGE VELOCITY (FPS)
SD-1	0.129	15	0.32	2.32
SD-2	6.868	24	10.63	3.85

The inlet and outlet of the culvert at the access road entrance will be armored and stabilized with rip-rap aprons in accordance with the detail on the civil construction details sheet of the Project Drawings. Armoring with D_{50} =6-inch stone will provide sufficient velocity dissipation to prevent erosion. The inlet and outlet of the culvert at the swale crossing will maintain existing conditions to avoid wetland or natural resource impacts. The proposed culvert at this location has an increased diameter compared to the existing culvert. As a result, the discharge velocities will be reduced. Existing conditions at the inlet and outlet are stable so they are anticipated to adequately manage the reduced velocities from the proposed culvert and prevent erosion.

5.4 Infiltration Systems

No infiltration systems are proposed for the Project.

5.5 Drainage Easement Declarations

The proposed stormwater features are located entirely on lands that are or will be under control of Solar Fields for the entire lifecycle of the Project. Therefore, the development will not require the establishment of drainage easements.

6.0 Stormwater Quality – Phosphorus Control Plan

In order to limit the impact of the proposed development on lake water quality, a Phosphorus Control Plan has been prepared and associated control measures have been provided for in the Project design. The Town of Belgrade Commercial Development Review Ordinance requires that a phosphorus control plan be provided if a proposed development consists of more than 15,000 square feet of disturbed area, 7,500 square feet of impervious area, or construction of new roads/driveways in excess of 250 feet. The Project exceeds the thresholds of the Town's "Simplified Phosphorus Method"; therefore, the Phosphorus Control Plan has been prepared in accordance with the Maine Stormwater Management Design Manual, Volume II – *Phosphorus Control Manual* ("MDEP Phosphorus Control Method"), dated March 2016.

6.1 Watershed Per-Acre Phosphorus Allocation

Runoff from the Project Area drains southerly to a variety of non-jurisdictional drainages, intermittent streams, and unnamed tributaries eventually converging to Belgrade Stream and on to Messalonskee Lake. The allowable phosphorus allocation for the Messalonskee Lake Watershed in the Town of Belgrade is 0.068 lb/acre/yr, as specified in the Town's ordinance and the MDEP Phosphorus Control Method, Appendix C – *Per Acre Phosphorus Allocations for Selected Maine Lakes*, updated November 1, 2017.

6.2 Project Phosphorus Budget

The Project's phosphorus budget (PPB) is the maximum amount of algal available phosphorus which may be exported from the proposed development. The PPB is 1.646 pounds of phosphorus per year, as determined from the calculations provided in the MDEP Phosphorus Control Method, Appendix D, Worksheet 1. As part of the calculation, the acreage of developable land is determined by subtracting the footprints of wetlands and sustained slopes greater than 25% from the total area of the parcel to be developed. The Project did not qualify for the small watershed adjustment which is available for large projects located in relatively small watersheds.

6.3 Project Phosphorus Export

To determine the phosphorus control measures that should be provided with the proposed development in order to meet the PPB, the Project phosphorus export (PPE) is calculated using the MDEP Phosphorus Control Method, Appendix D, Worksheet 2. The pre-treatment PPE is determined based on the land surface types and associated acreage for the proposed development and the phosphorus export coefficients for each land surface type. Table 3.1 of the MDEP Phosphorus Control Method were used to determine the export coefficients since the Project is a commercial development. The total pre-PPE is estimated at 0.713 pounds per year. The pre-PPE is less than the PPB by approximately 0.933 pounds per year; however, stormwater best management practices (BMPs) are still being proposed to further reduce the PPE to accommodate potential future property developments.

6.4 Phosphorus Control Measures

BMPs are used to remove phosphorus from the stormwater before it leaves the Project site and can include phosphorus control measures such as vegetated buffers, wet ponds, soil filters, and infiltration beds. For this Project, a vegetated buffer is being proposed as shown in the Site Grading & Drainage Plan included with the Issued For Permitting drawing set. Worksheet 2 continues to be used to calculate the post-PPE by applying treatment factors for the selected BMPs. The total post-PPE is estimated at 0.586 pounds per year which further reduced the PPE below the PPB by approximately 1.06 pounds per year. The Project is proposing to fully meet the PPB by incorporating BMPs into the design. As a result, mitigation credits for pre-existing sources are not required.

The calculation spreadsheets, including a PPE summary spreadsheet using the MDEP Phosphorus Control Method, Appendix D, Worksheet 4, are included in **Attachment B**.

6.5 Engineering Inspection for Stormwater Management Facilities

Solar Fields ensures that a qualified engineer or professional (a Professional Engineer (PE), a Certified Professional in Erosion and Sedimentation Control (CPESC), or similar specialist) will inspect the construction site periodically to verify that construction is completed in accordance with the details and specifications shown on the civil design drawings, and that proposed structures are functioning as designed. These inspections will commence with the initial earth-disturbing activities on the site and will continue, as needed, during any period when construction activity affecting the stormwater management system occurs, and until the site is permanently stabilized.

Additional inspections of the site will be conducted during and after construction to evaluate and maintain the condition and effectiveness of erosion and sedimentation control measures. BMPs for erosion control and stormwater pollution prevention will be inspected weekly (at a minimum) and after significant (e.g., >0.5") rain events throughout construction. Maintenance of temporary and permanent controls will be completed as needed and to correct any observed erosion or sedimentation. The inspection and maintenance of erosion control measures and phosphorus control measures are described in more detail in Section 7.0.

7.0 Erosion & Sedimentation Control – Basic Standards

This plan has been developed based on good engineering practices, generally accepted industry standards, and in accordance with the guidance provided in the “Maine Erosion and Sediment Control Best Management Practices Manual for Designers and Engineers” (MDEP, Rev. October 2016²).

7.1 Project Schedule

Construction of the Project is tentatively scheduled to commence in the spring of 2021 with the intent of being fully operational by the end of the 2022 calendar year. Currently, the total Project duration is anticipated to be approximately 4 months.

Additionally, specifics of how work is completed will be based on environmental considerations associated with seasonal changes. The following dates are provided to establish a general guideline for these seasons:

- Winter: November 1 to March 19
- Mud Season: March 20 to April 30
- Spring: May 1 to June 21
- Summer: June 22 to September 21
- Fall: September 22 to October 31

7.2 Erosion and Sediment Control Measures

The contractor shall utilize the following general measures and practices throughout construction and development of the Project:

- Erosion and sedimentation control BMPs shall be implemented prior to commencing earth disturbing activities;
- Phase construction activities as practicable to minimize the area and duration bare soils are exposed;
- Route all construction traffic through approved points of access and egress and over stabilized construction entrances;
- Only areas of active construction shall remain un-stabilized or unvegetated;
- Protect and maintain identified buffer areas throughout construction;
- Continuously maintain and inspect installed BMPs; and
- Double rows or paired BMP systems shall be implemented to protect critical areas.

Whenever practicable, no disturbance activities should take place within 50 feet of any protected natural resource. If disturbance activities take place upgradient to and between 30 feet and 50 feet of any protected natural resource, perimeter erosion controls must be doubled. If disturbance activities take place upgradient to and less than 30 feet from any protected natural resource, perimeter erosion controls must be doubled and disturbed areas must be temporarily or permanently stabilized within 7 days.

² Available online: http://www.maine.gov/dep/land/erosion/escbmps/esc_bmp_engineers.pdf

7.2.1 Temporary Measures

The following temporary erosion control BMPs are proposed and/or are likely anticipated to be needed during construction and development of the Project:

- **Stabilized Construction Entrance:** As indicated on the civil design drawings, stabilized construction entrances will be required at each point of ingress/egress. These features will be of significant importance at intersections with public roads. Construction entrances shall have a minimum length of 50 feet and an appropriate width (minimum of 12 feet) to fully contain anticipated construction vehicles. Construction entrances shall be constructed of a 6-inch thick layer of 2-inch angular crushed stone underlain by a woven geotextile fabric. A diversion ridge shall be required at the bottom of slopes exceeding 5% to intercept runoff. Berms may be necessary to divert runoff from the construction entrance to a temporary sediment trap. Under extremely wet conditions or during the mud season, a standard construction entrance may not be sufficient to fully remove sediment from vehicle tires and prevent tracking. In these instances, a construction entrance may either be lengthened as necessary or a wheel washing procedure shall be employed. Stabilized construction entrances shall be inspected on a weekly basis and prior to and immediately following significant rain events (those exceeding 0.5-inches in 24-hours). Tracked mud or sediment shall be removed prior to the next rain event. Periodic replacement of the stone material may be required as sediment accumulates and fills the voids.
- **Dust Control:** Measures to control creation and migration of nuisance dust shall be implemented throughout construction. Primary travel ways and laydown areas shall be surfaced with base gravel or coarse gravel as soon as possible to minimize the creation of dust. Traffic control shall be implemented to reduce speeds and restrict traffic. Frequently traveled surfaces shall be periodically watered to reduce dust. Areas that become a significant source of dust may be treated with calcium chloride to reduce frequency of watering. Paved surfaces shall be vacuum swept when dry.
- **Erosion Control Mix:** Erosion control mix (ECM) mulch may be utilized to stabilize slopes, frozen ground, forested areas, or to provide immediate stabilization without waiting for vegetation to establish. ECM shall be placed at a minimum thickness of 2 inches on slopes of 3H:1V or flatter. Slopes steeper than 3H:1V require a minimum of 4 inches. ECM shall be evenly distributed by hand, excavator bucket, or pneumatic blower. ECM alone is not suitable in areas of groundwater seepage, converging flows, or low-lying areas where ponding is expected.
- **Erosion Control Mix Berms:** Erosion control mix berms shall be lightly compacted or bucket-tamped to minimize large voids within the filter media. Berms shall be a minimum of 12-inches tall and 2 feet wide. Condition of erosion control berms shall be continuously monitored throughout construction and replaced or repaired as necessary.
- **Silt Fence:** Silt fence shall be installed in an alignment that follows the contour as much as practicable. Stakes shall be anchored a minimum of 12-inches into the ground and the bottom flap of the geotextile fabric shall be keyed in a 6-inch by 6-inch trench excavated on the upgradient face of the fence line. Trench shall then be backfilled with compacted native materials and compacted. When joints are necessary, the fabric shall be spliced by wrapping end stakes together.
- **Straw Bale Barrier:** Straw bales are intended for use as a sediment barrier when the contributing drainage area is small or where site conditions prevent installation of more substantive measures. Their use may also be necessary as a secondary form of protection when paired with another sediment barrier (i.e., silt fence) to further protect

critical areas or as an emergency measure for controlling unexpected sedimentation until a permanent BMP can be implemented. When installed, straw bales should be entrenched a minimum of 4-inches and anchored with 2 stakes per bale. Gaps between adjacent bales should be chinked with straw to prevent flow between the bales. Overtime straw bales will degrade and deteriorate and will require frequent inspection and periodic replacement. Due to their versatility and ability for rapid deployment during an emergency situation, it is recommended that a supply of straw bales be maintained on site at all times.

- Compost Filter Sock: Compost filter sock can be purchased from a commercial manufacturer or field-built from nonwoven geotextile fabric and processed ECM or other finely shredded material (i.e., coconut fiber, etc.). Compost filter sock can be a useful sediment barrier for small drainage areas or where trenching for silt fence is not possible (i.e., pavement). Compost filter socks shall be installed so that complete contact with the ground is achieved across the entire length. Staking will be necessary on steeper slopes. Once stabilization is achieved compost filter socks can be cut open and the filter material can be spread in place.
- Topsoil Stockpile: All topsoil stripped from work areas shall be stockpiled onsite for future use. Areas chosen for topsoil stockpiling shall be dry and stable. Stockpiles shall have a maximum slope of 2H:1V and be completely surrounded by perimeter sediment barriers (i.e., silt fence, filter socks, etc.). Once constructed, stockpiles shall be stabilized with seed and mulch for permanent stabilization or covered as temporary stabilization.
- Stone Check Dams: Stone Check dams may be necessary in existing or proposed upland swales and ditches to reduce flow velocity and promote sedimentation prior to final discharge of runoff. Reduction in flow velocity will serve to reduce rilling in flow paths and promote establishment of vegetation. Stone for check dams shall be comprised of well-graded crushed stone, from one to six inches in diameter. The core of the check dams shall be keyed into the trench line to prevent undermining. Check dams shall be spaced so that the top of the downgradient check dam is at the same elevation as the toe of the preceding check dam.
- Concrete Washout: Concrete washout(s) shall be sized to contain all wash water and solids without overflowing. A below-grade washout shall be sized to contain all liquid wastes with 4 inches of freeboard. Access to the washout shall be stable and secure. A washout facility shall not be placed within 50 feet of a storm drain or discharge point unless the containment is lined with anchored plastic sheeting (10-mil min. thickness) and is not allowed to overflow. Inspect washouts daily to assess usage and identify leaks. Dispose of solids appropriately.
- Temporary Mulching: Temporary mulching shall be applied to areas not yet prepared for permanent stabilization but that have been or shall be inactive for a maximum of 7-days. Temporary mulching shall consist of spreading straw mulch or erosion control mix across bare soil. Erosion control blankets or other methods may be substituted for areas where temporary mulching has proven to be ineffective. Areas of temporary mulching shall be inspected weekly and before and after significant storm events (greater than 0.5-inches in 24hrs). Temporary mulch application rates shall be doubled from November 1 through April 15.

7.2.2 Permanent Measures

The following erosion control BMPs are proposed to be used during construction and shall remain in-place after Project completion and be maintained throughout operation of the facility:

- **Erosion Control Blanket:** Erosion control blanket (ECB) shall be utilized on disturbed slopes steeper than 3H:1V, vegetated swales or ditches, to stabilize the array drip edge as necessary, and areas where immediate stabilization is desired. ECB shall be installed on prepared soils in a manner such that complete contact with the subgrade is achieved. ECB shall be anchored with ground staples in accordance with the manufacturer's recommendations and aligned parallel to slopes.
- **Gravel Roads:** Roads shall be constructed with a crown or super-elevated as indicated on the design drawings to ensure runoff is delivered immediately to adjacent stabilized areas. Roadways shall be aligned in general conformance with those shown on the design drawings and constructed of specified aggregate base and subbase materials. Roadways shall be inspected for rutting, washboarding, and other signs of erosion. Installation of water bars, french drains, or other features may be necessary depending on conditions observed in the field and as directed by the Engineer during construction.
- **Vegetative Stabilization:** Seeding and mulching for final stabilization shall be completed as soon as practicable and phased throughout construction. All areas achieving final grades or topsoil placement shall be seeded and mulched within 7 calendar days. Areas of final stabilization shall be clearly marked in the field and protected so as to prevent damage from construction vehicle traffic. Areas shall be inspected throughout construction and at a minimum of monthly after Project completion until 90% vegetative growth is achieved. The following tables provide a summary of permanent mulch and seeding requirements.
- **Vegetated Buffers:** The vegetated buffers are designed to provide long-term stormwater treatment and erosion and sedimentation control. Upgradient runoff not intended for the buffers shall be diverted away through the proposed access road culvert. Upon completion of Project construction, the vegetated buffers will be inspected, and any eroded areas will be repaired as directed by the Engineer.

Table 7.1. Mulch application rates

SUMMARY OF TEMPORARY AND PERMANENT MULCH APPLICATION REQUIREMENTS			
CONDITION	TIMING	MULCH TYPE ²	APPLICATION RATES
Temporary			
Inactive Areas	If no activity in exposed areas for 7 days, or prior to a predicted storm event.	Straw Mulch ¹ , Wood Fiber Mulch Erosion Control Mix	2 tons/acre 1 ton/acre 2" thick over area
All Disturbed Areas of the Construction Workspace	Apply mulch to all exposed areas if no activity occurs within 30 days. Apply mulch and temporary seeding sooner when it can be anticipated that activity is not going to occur within 30 days.	Straw Mulch Wood Fiber Mulch	2 tons/acre 1 ton/acre ³
All Work Areas Exposed Are To Be Mulched Each Time Soil Is Disturbed ⁵	November 1 through April 15	Straw Mulch Wood Fiber Mulch	4 tons/acre 2 tons/acre
Permanent			

On all Exposed Areas After Seeding To Stabilize the Soil Surface	Permanent grass and/or legume seeding covered by hay or straw mulch on all areas that have been restored to final grade. This does not apply to areas stabilized by other means such as ECB or permanent ECM.	Crimped Straw Mulch Paper Mulch Wood Fiber Mulch	2 tons/acre 1500lbs/acre ⁴ 1 ton/acre
Wood Chip Application Areas ⁶	Permanent grass and/or legume seeding covered by hay or straw mulch on all areas that have been restored to final grade. This does not apply to areas stabilized by other means such as ECB or permanent ECM.	Crimped Straw Mulch Paper Mulch Wood Fiber Mulch	2 tons/acre 1500lbs/acre ⁴ 1 ton/acre

Notes:

1. Straw and hay mulch may be used interchangeably, except in wetland areas where straw mulch will be required.
2. Double the rate of wood fiber mulch when used in or adjacent to critical areas. Increase mulch rate by half under solar array drip edge.
3. Straw, hay, or hydraulic mulch shall provide a minimum of 90% ground cover.
4. Paper mulch is acceptable for use during the growing season only. On slopes greater than 30% and in areas where vegetation has no established well, additional hay mulch will be added as a winterizing measure.
5. Mulch may not be spread on top of snow.
6. Woodchips shall be applied at a maximum thickness of 4 inches and only in upland areas.

Table 7.2. Seed mixes

SEED MIX SPECIFICATIONS		
SEEDING PLAN AND SEED MIX	SEED MIX COMPONENTS	LB./ACRE
Temporary Seeding		
Uplands: Annual Ryegrass	-	40
Permanent Seeding		
Uplands: New England Logging Road Mix (New England Wetland Plants) <i>or similar if approved</i>	Native Grasses, Rushes and Forbs	20
Designated Pollinator Planting Areas: New England Conservation/Wildlife Mix (New England Wetland Plants) <i>or similar if approved</i>	Native Grasses, Rushes and Wildflowers	35
Woodchip Application Areas: New England Logging Road Mix (New England Wetland Plants) <i>or similar if approved</i>	Native Grasses, Rushes and Forbs	20
Wetlands: None	-	NA
Supplemental Winter Seed Mix: Winter Ryegrass	-	120

Notes:

1. Increase seeding rates by 10% when hydroseeding.
2. Winter rye will be added to permanent upland mix at a rate of 120lb/acre between October 1 and April 15.

Table 7.3. Seeding requirements

SUMMARY OF SEEDING REQUIREMENTS		
CONDITION	TIMING	SEED MIX
Temporary Seeding	Between April 15 and October 1 Only. Disturbed areas or soil stockpiles will be seeded immediately if further disturbance is not expected for 30 days or more.	Annual Ryegrass
Permanent Seeding		
Upland Areas	Exposed soils to be seeded within 7 days of final grading and topsoil placement	Permanent Upland Mix
Slopes > 3H:1V	Seeded immediately after seedbed preparation	Permanent Upland Mix
Wetlands	No disturbance or seeding in wetlands	NA
Woodchip Application Areas	Seeded within 7 days of final grading and topsoil placement	Woodchip Application Seed Mix
Winter Dormant Seeding	Seeded within 7 days of final grading and topsoil placement	Permanent Upland + Winter Rye
Buffer Areas	Seeded immediately after seedbed preparation	Permanent Upland Mix

Notes:

1. Timing: Weather conditions permitting.
2. Areas that do not successfully revegetate within appropriate period of time will be reseeded as necessary.
3. Scarify compacted surfaces to a minimum depth of 4-inches.
4. Top dress with 4 to 6 inches of loam, as needed.

7.2.3 Erosion Control Measure Removal

The removal and disposal of erosion and sedimentation control measures shall be the responsibility of the Contractor. BMPs shall remain in-place until a minimum of 90% cover of vegetation has been achieved or other permanent measures of stabilization are installed (i.e., rip-rap, erosion control mix, etc.). Sediment trapped in front of perimeter sediment barriers shall be spread within an area undergoing final grading and distributed in a uniform manner conforming to local topography, and then seeded and mulched. Erosion control berms and compost filter socks may be demolished, and the erosion control mix filter media may be evenly distributed across the adjacent areas.

7.3 Overwinter Construction

The following general practices and procedures should be utilized during any construction occurring over the winter season and through April 15:

- Exposed areas should be limited to those where work will occur within the next 14 calendar days;
- Exposed areas should not exceed the limit of what can be mulched in one day (prior to predicted precipitation);
- At the end of each construction day, areas that have been brought to final grade must be stabilized; Where frozen ground prevents installation of silt fence or ground penetrating sediment barriers, the Contractor shall request an appropriate detail modification from the Engineer;
- Permanent seeding shall not be attempted, unless a dormant seeding application method is approved by the Engineer;
- All areas within 75 feet of a protected natural resource must be protected with a double row of sediment barriers; and

- All vegetated ditch lines that have not been stabilized by November 1, or will be worked on between November 1 and April 15, must be stabilized with stone lining backed by gravel bed or geotextile as specified by the Engineer.

7.4 Housekeeping

As an authorized agent of the Applicant, the Contractor shall maintain the Project site in accordance with the following performance standards and housekeeping practices:

Spill Prevention: Controls shall be in place to prevent pollutants from being discharged from materials used and stored onsite. Appropriate controls include, but are not limited to, proper storage practices that minimize exposure of materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.

Groundwater Protection: During construction, the Contractor may not store or handle liquid petroleum products and other hazardous materials with the potential to contaminate groundwater in areas of the Project sites draining to an infiltration area or within 100 feet of a critical resource area or stream. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storing and handling liquid hazardous materials.

Fugitive Sediment and Dust: During construction, the Contractor shall take all necessary actions to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Operations during dry months, that experience fugitive dust problems, should wet down unpaved access roads once a week or more frequently as needed with a water additive. Oil may not be used for dust control. The Contractor shall monitor vehicles entering and exiting the Project site for evidence of tracking mud onto public or private roadways outside the work area. If necessary, the Contractor shall provide a means for sweeping and cleaning road areas experiencing tracking. If off-site tracking occurs on public roads, they should be swept immediately and no less than once a week and prior to significant storm events. During the mud season, it may be necessary to increase the size of stabilized construction entrances or provide a wheel washing station.

Debris and Other Materials: The Contractor shall manage all litter, construction debris, and construction chemicals exposed to stormwater to prevent materials from becoming a source of pollution.

Trench or Foundation Dewatering: Trench dewatering is the removal of water from trenches, foundations, coffer dams, ponds, sumps, basins, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The Contractor shall remove collected water from the ponded areas, either through gravity or by pumping, in a manner that spreads effluent through natural wooded buffers or to areas that are specifically designed to collect the maximum amount of sediment possible (i.e., cofferdam sediment basin or dirt-bag). The Contractor shall avoid practices that allow sediment laden water from dewatering to flow over disturbed areas of the Project site. Other measures or methods may be utilized as reviewed and approved by the Engineer and, if necessary, the MDEP. A typical detail for standard dewatering practices is provided on the civil design drawings.

Non-Stormwater Discharges: The Contractor shall identify and prevent contamination by unauthorized non-stormwater discharges. Unauthorized stormwater discharges include, but are

not limited to, wastewater from concrete washout, fuels or hazardous substances, and detergents used in vehicle and equipment washing.

7.5 Inspection & Maintenance

The Contractor shall bear the responsibility of installation, maintenance, and day to day monitoring, repair, and replacement of erosion and sedimentation control measures throughout the entire duration of the Project. It is the responsibility of the Contractor to ensure installed measures are effective and functioning as designed. Inspections may indicate additional or more substantive measures are required.

At a minimum, inspections shall be conducted on a weekly basis and within 24-hours of a significant rain event (>0.5" in 24-hours). Inspections shall be documented in site inspection reports that are kept on the Project site at all times. An example inspection report template is provided as **Attachment C**. A copy of the site inspection reports shall be retained by Solar Fields for a period of at least three years from the completion of permanent stabilization.

Presence of a third-party inspector does not relieve the Contractor of inspection and reporting responsibilities.

7.6 Erosion & Sedimentation Control Conclusion

In the event that a situation arises that is not specified above or depicted on the civil design drawings, the Contractor shall follow the guidance of "Maine Erosion and Sediment Control Best Management Practices Manual for Designers and Engineers" (MDEP, Rev. October 2016). If the Project is phased and constructed in accordance with the specifications and requirements of the civil design drawings and basic standards listed above, the Project will not result in significant erosion or sedimentation.

8.0 Post-Construction Stormwater Maintenance Plan

The Project will be owned, operated, and maintained solely by Solar Fields. During construction, the site will be periodically inspected by a qualified engineer or professional (PE, CPESC, or similar specialist) to ensure the work is being conducted in accordance with the civil design drawings and the erosion and sedimentation control plan, and that applicable features are functioning as designed. Once permanent stabilization is achieved, the Project will be operated by a qualified maintenance representative who will be responsible for inspection and maintenance of the entire grounds and stormwater management features.

8.1 Facilities to be Maintained

The stormwater management features to be maintained at the Project include:

- Access Roadway;
- Culverts;
- Vegetated Buffers; and
- Revegetated Areas and Embankments.

8.2 General Inspection and Maintenance Requirements

Generally, the proposed facility will be operated and maintained in a manner consistent with good utility practices, including a minimum of biannual (spring and fall) onsite inspections and maintenance of stormwater management system components, as needed. A post-construction maintenance and inspection log will be completed as part of the quarterly onsite inspections, refer to **Attachment C** for a template of this inspection log. A copy of the log shall be retained by Solar Fields for a period of at least five years from the completion of permanent stabilization.

Potential maintenance concerns associated with specific areas and facilities at the facility are discussed in the following paragraphs.

8.3 Access Roadway

The access roadway will typically require little on-going maintenance, owing to their primary and limited use by light-duty vehicles. These areas will be inspected quarterly, and signs of existing or developing erosion, rutting, trash or unwanted vegetation will be removed/repared as needed. Additionally, shoulders shall be inspected for low spots or evidence of channelized flow and false ditching. Repair/maintenance shall be completed as necessary to ensure runoff from the roadways is conveyed as sheet flow to the downgradient stabilized areas.

8.4 Culverts

Culverts shall be inspected on a quarterly basis. Evidence of erosion or sedimentation at the inlet and outlet aprons shall be repaired as necessary. Signs of heaving, reduced cover, blockage/clogging, or piping shall be monitored, recorded, and repaired when necessary.

8.5 Vegetated Buffers

The vegetated buffers will be inspected quarterly to ensure the integrity of the vegetated surface and that runoff is being conveyed as well-distributed sheet flow. Any signs of existing or developing erosion, rutting, debris, or unwanted vegetation within the vegetated buffer will be removed/repared as needed.

8.6 Revegetated Areas and Embankments

Revegetated areas and embankments will be inspected quarterly. Any signs of erosion or inadequate revegetation of these areas will be corrected as needed.

8.7 Re-certification

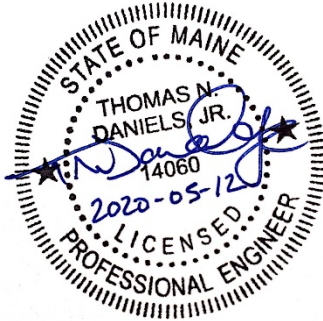
As required in Chapter 500, re-certification will be required for each five-year interval from the date of issuance of the permit. The Owner shall submit certification of the following items within 3-months of the expiration of each permit interval:

- All areas of the Project site have been inspected for evidence of erosion, and all areas of identified erosion have been permanently stabilized.
- All aspects of the permanent stormwater management system (i.e., culverts, buffer areas) have been inspected for evidence of damage, wear, and malfunction, and that all necessary steps have been taken to repair or replace the system, or portions of the system.

- The erosion and stormwater management plan for the Project is being implemented as written, or modifications to the plan have been submitted to and approved by the Department, and the maintenance log is being maintained.

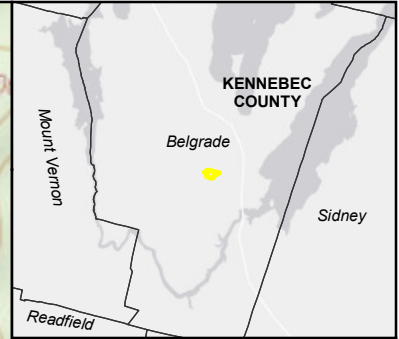
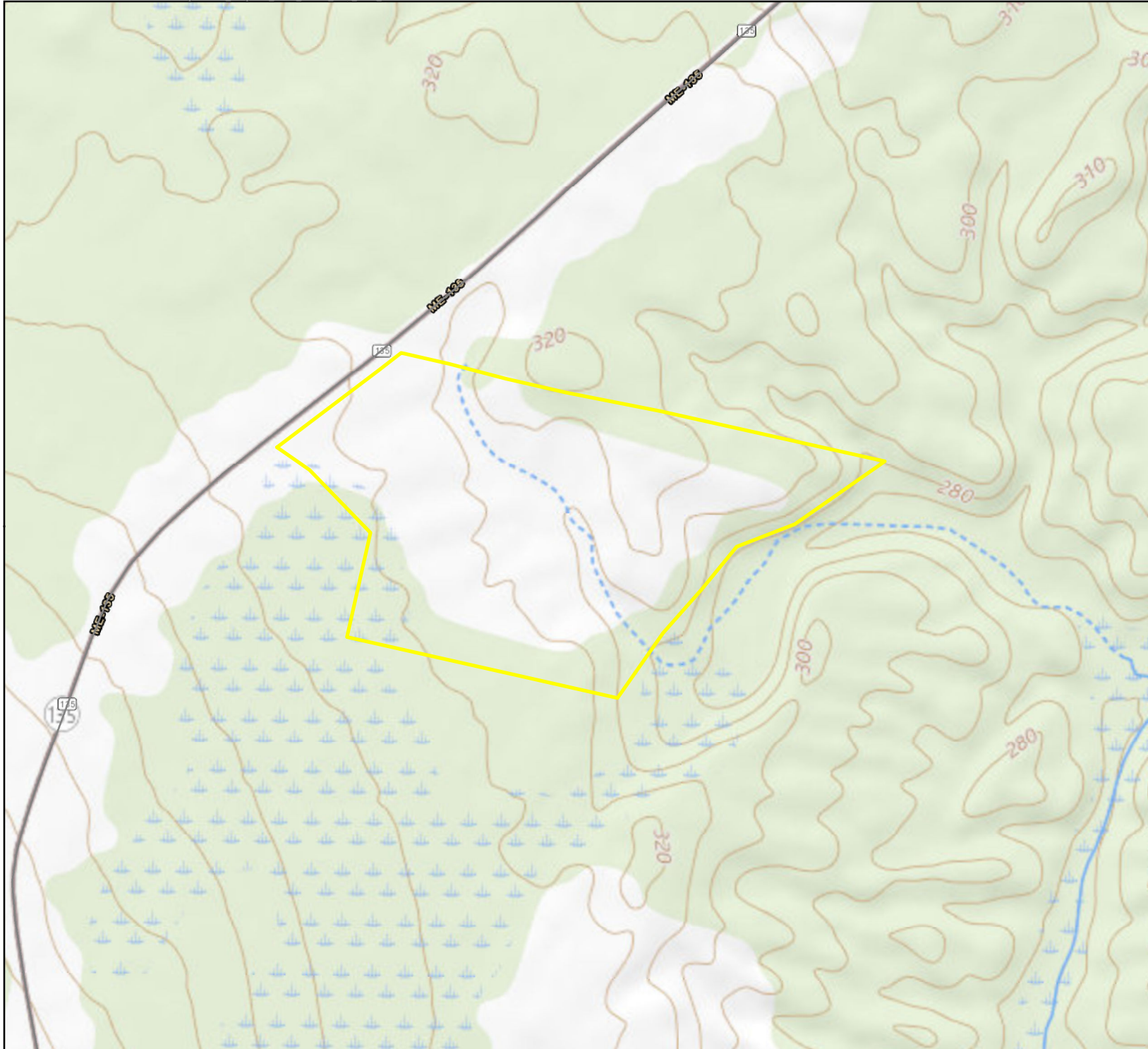
9.0 Certification – Professional Engineer

This stormwater report and the following attachments have been completed by me or under my direct supervision.



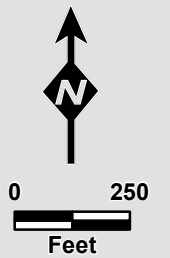
Thomas N. Daniels, TRC Environmental, Inc.
Maine-Registered PE # 14060

Attachment A: Figures & Maps



Legend

— Project Boundary



**Solar Fields
Belgrade Solar Project**
Kennebec County, Maine

Site Topography

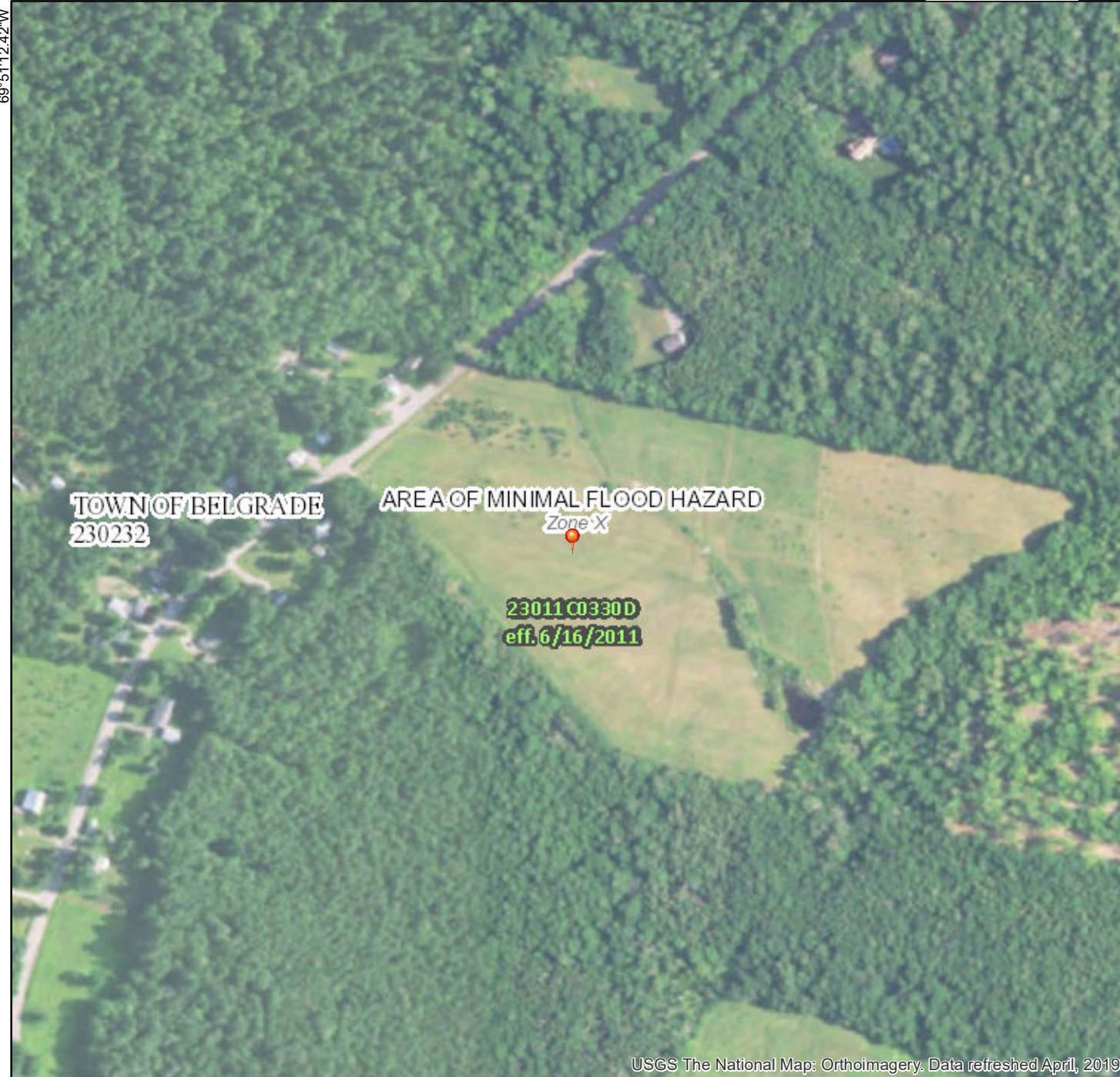


14 Gabriel Drive
Augusta, ME 04330

National Flood Hazard Layer FIRMette



44°27'39.66"N



USGS The National Map: Orthoimagery. Data refreshed April, 2019.

0 250 500 1,000 1,500 2,000 Feet 1:6,000

Legend

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

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped
		The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.



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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **4/14/2020 at 4:18:32 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

Attachment B: Stormwater Calculations



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 **Kennebec County, Maine**

**Solar Fields - Parker Station,
Manchester Road, Belgrade, ME**



April 14, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

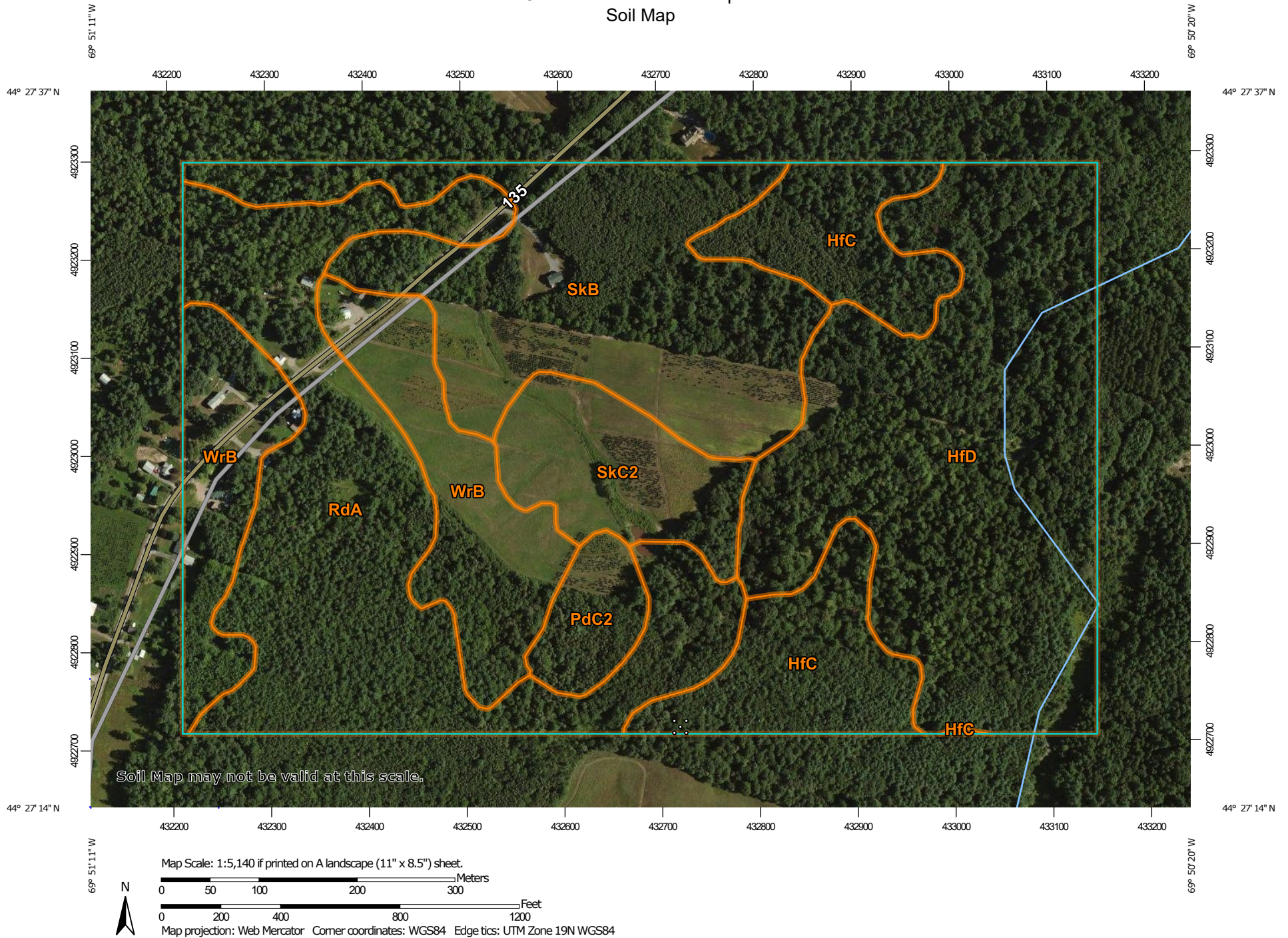
Contents

Preface	2
Soil Map	5
Soil Map.....	6
Legend.....	7
Map Unit Legend.....	8
Map Unit Descriptions.....	8
Kennebec County, Maine.....	10
HfC—Hartland very fine sandy loam, 8 to 15 percent slopes.....	10
HfD—Hartland very fine sandy loam, 15 to 25 percent slopes.....	12
PdC2—Paxton-Charlton fine sandy loams, 8 to 15 percent slopes, eroded.....	14
RdA—Ridgebury very stony fine sandy loam.....	16
SkB—Scio very fine sandy loam, 3 to 8 percent slopes.....	18
SkC2—Scio very fine sandy loam, 8 to 15 percent slopes, eroded.....	20
WrB—Woodbridge fine sandy loam, 3 to 8 percent slopes.....	21

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



Custom Soil Resource Report

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 1:20,000.

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: Kennebec County, Maine
Survey Area Data: Version 18, Sep 16, 2019

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

Date(s) aerial images were photographed: Jul 17, 2010—Aug 31, 2010

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HfC	Hartland very fine sandy loam, 8 to 15 percent slopes	14.5	10.7%
HfD	Hartland very fine sandy loam, 15 to 25 percent slopes	36.4	26.9%
PdC2	Paxton-Charlton fine sandy loams, 8 to 15 percent slopes, eroded	3.3	2.5%
RdA	Ridgebury very stony fine sandy loam	29.8	22.0%
SkB	Scio very fine sandy loam, 3 to 8 percent slopes	25.5	18.9%
SkC2	Scio very fine sandy loam, 8 to 15 percent slopes, eroded	8.0	5.9%
WrB	Woodbridge fine sandy loam, 3 to 8 percent slopes	17.5	13.0%
Totals for Area of Interest		135.1	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

Custom Soil Resource Report

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.

Kennebec County, Maine

HfC—Hartland very fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9k04

Elevation: 10 to 2,200 feet

Mean annual precipitation: 30 to 48 inches

Mean annual air temperature: 37 to 46 degrees F

Frost-free period: 70 to 160 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Hartland and similar soils: 87 percent

Minor components: 13 percent

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

Description of Hartland

Setting

Landform: Coastal plains

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Tread

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Coarse-silty glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: very fine sandy loam

H2 - 7 to 15 inches: very fine sandy loam

H3 - 15 to 28 inches: silt loam

H4 - 28 to 65 inches: very fine sandy loam

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Hydric soil rating: No

Minor Components

Scio

Percent of map unit: 5 percent

Landform: Outwash plains

Landform position (two-dimensional): Toeslope

Custom Soil Resource Report

Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Hartland, < 8 percent slopes

Percent of map unit: 2 percent
Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Buxton

Percent of map unit: 2 percent
Landform: Marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Scantic

Percent of map unit: 2 percent
Landform: Coastal plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Windsor

Percent of map unit: 1 percent
Landform: Eskers
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Hartland, > 15 percent slopes

Percent of map unit: 1 percent
Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

HfD—Hartland very fine sandy loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9k05
Elevation: 10 to 2,200 feet
Mean annual precipitation: 30 to 48 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 70 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Hartland and similar soils: 91 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hartland

Setting

Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Coarse-silty glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: very fine sandy loam
H2 - 7 to 15 inches: very fine sandy loam
H3 - 15 to 28 inches: silt loam
H4 - 28 to 65 inches: very fine sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Buxton

Percent of map unit: 3 percent
Landform: Marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Hartland, > 25 percent slopes

Percent of map unit: 2 percent
Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Scio

Percent of map unit: 2 percent
Landform: Outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Windsor

Percent of map unit: 1 percent
Landform: Eskers
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluvium
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Hartland, < 15 percent slopes

Percent of map unit: 1 percent
Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

PdC2—Paxton-Charlton fine sandy loams, 8 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: 9k0y
Elevation: 10 to 3,500 feet
Mean annual precipitation: 34 to 50 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 60 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Paxton and similar soils: 60 percent
Charlton and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Drumlins
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Coarse-loamy lodgment till derived from mica schist

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 31 inches: gravelly fine sandy loam
H3 - 31 to 65 inches: fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 18 to 40 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 18 to 26 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Description of Charlton

Setting

Landform: Drumlins

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Coarse-loamy supraglacial meltout till derived from mica schist

Typical profile

H1 - 0 to 6 inches: fine sandy loam

H2 - 6 to 20 inches: gravelly fine sandy loam

H3 - 20 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Hydric soil rating: No

Minor Components

Tunbridge

Percent of map unit: 5 percent

Landform: Moraines

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Crest

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Woodbridge

Percent of map unit: 5 percent

Landform: Drumlins

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Hollis

Percent of map unit: 2 percent

Landform: Drumlins

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Crest

Down-slope shape: Convex

Custom Soil Resource Report

Across-slope shape: Convex

Hydric soil rating: No

Paxton, > 15 percent slopes

Percent of map unit: 1 percent

Landform: Drumlins

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Ridgebury

Percent of map unit: 1 percent

Landform: Till plains

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Hydric soil rating: Yes

Paxton, < 8 percent slopes

Percent of map unit: 1 percent

Landform: Drumlins

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

RdA—Ridgebury very stony fine sandy loam

Map Unit Setting

National map unit symbol: 9k17

Elevation: 10 to 2,500 feet

Mean annual precipitation: 30 to 50 inches

Mean annual air temperature: 37 to 46 degrees F

Frost-free period: 70 to 160 days

Farmland classification: Not prime farmland

Map Unit Composition

Ridgebury and similar soils: 85 percent

Minor components: 15 percent

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

Description of Ridgebury

Setting

Landform: Till plains

Landform position (two-dimensional): Footslope

Custom Soil Resource Report

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Parent material: Coarse-loamy lodgment till derived from mica schist

Typical profile

H1 - 0 to 8 inches: fine sandy loam

H2 - 8 to 14 inches: fine sandy loam

H3 - 14 to 65 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent

Percent of area covered with surface fragments: 1.6 percent

Depth to restrictive feature: 10 to 25 inches to densic material

Natural drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)

Depth to water table: About 0 to 12 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C/D

Hydric soil rating: Yes

Minor Components

Peru

Percent of map unit: 5 percent

Landform: Till plains

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Rise

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Woodbridge

Percent of map unit: 5 percent

Landform: Till plains

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Peacham

Percent of map unit: 3 percent

Landform: Till plains

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Ridgebury, > 3% stone cover

Percent of map unit: 2 percent
Landform: Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

SkB—Scio very fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9k1d
Elevation: 10 to 2,200 feet
Mean annual precipitation: 30 to 48 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 70 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Scio and similar soils: 89 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scio

Setting

Landform: Outwash plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Very fine sand glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: very fine sandy loam
H2 - 10 to 22 inches: silt loam
H3 - 22 to 65 inches: very fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C

Hydric soil rating: No

Minor Components

Hartland

Percent of map unit: 3 percent

Landform: Coastal plains

Landform position (two-dimensional): Shoulder

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Scantic

Percent of map unit: 3 percent

Landform: Coastal plains

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Windsor

Percent of map unit: 2 percent

Landform: Outwash plains

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Riser

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Buxton

Percent of map unit: 2 percent

Landform: Till plains

Landform position (three-dimensional): Rise

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Scio, > 3% slopes

Percent of map unit: 1 percent

Landform: Outwash plains

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Talf

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: No

SkC2—Scio very fine sandy loam, 8 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: 9k1f
Elevation: 10 to 2,200 feet
Mean annual precipitation: 30 to 48 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 70 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Scio and similar soils: 89 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scio

Setting

Landform: Eskers
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Very fine sand glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: very fine sandy loam
H2 - 10 to 22 inches: silt loam
H3 - 22 to 65 inches: very fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Hartland

Percent of map unit: 3 percent
Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Head slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Windsor

Percent of map unit: 2 percent
Landform: Outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Scantic

Percent of map unit: 2 percent
Landform: Coastal plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scio, > 15 percent slopes

Percent of map unit: 2 percent
Landform: Eskers
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Buxton

Percent of map unit: 2 percent
Landform: Till plains
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

WrB—Woodbridge fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9k1r

Custom Soil Resource Report

Elevation: 10 to 3,500 feet
Mean annual precipitation: 34 to 50 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 60 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Woodbridge

Setting

Landform: Till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from mica schist

Typical profile

H1 - 0 to 7 inches: fine sandy loam
H2 - 7 to 22 inches: fine sandy loam
H3 - 22 to 65 inches: fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 30 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 16 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Hollis

Percent of map unit: 3 percent
Landform: Till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Tunbridge

Percent of map unit: 3 percent
Landform: Till plains

Custom Soil Resource Report

Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Paxton

Percent of map unit: 3 percent
Landform: Till plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Dip
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury

Percent of map unit: 2 percent
Landform: Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Charlton

Percent of map unit: 2 percent
Landform: Till plains
Landform position (three-dimensional): Dip
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Woodbridge, > 8% slopes

Percent of map unit: 2 percent
Landform: Till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Appendix C

Per Acre Phosphorus Allocations
for Selected Maine Lakes

Updated 11/1/17

Lake Name	Town in which development is located	Direct Watershed Area in Town (acres) DDA	Area not available for development (acres) ANAD	Area available for development (acres) AAD	GF	Expected developed area (acres) D	(lbP/y) F	Water Quality Category WQC	LOP	C	FC	Per acre phosphorus allocation (lb/acre/yr) P	Small Watershed Threshold (acres) SWT
Meduxnekeag Lake	Oakfield	6958	500	6458	0.15	969	70.05	mod-sens	h	0.75	52.54	0.054	242
Meetinghouse Pond	Phippsburg	69	15	54	0.25	14	0.66	mod-sens	m	1.00	0.66	0.049	3
Megunticook Lake Basin 1	Lincolnville	1176	240	936	0.25	234	17.61	mod-sens	h	0.75	13.21	0.056	59
Megunticook Lake Basin 2	Lincolnville	2513	250	2263	0.25	566	28.86	mod-sens	h	0.75	21.65	0.038	141
Megunticook Lake North Basin	Hope	874	100	774	0.25	194	10.03	mod-sens	h	0.75	7.52	0.039	48
Megunticook Lake South Basin	Camden	2807	560	2247	0.3	674	42.07	mod-sens	h	0.75	31.55	0.047	169
Megunticook Lake South Basin	Hope	1363	150	1213	0.25	303	20.44	mod-sens	h	0.75	15.33	0.051	76
Merril Pond	Lee	1465	500	965	0.25	241	14.57	mod-sens	m	1.00	14.57	0.060	60
Messalonskee Lake	Belgrade	11312	1286	10026	0.23	2274	205.7	mod-sens	h	0.75	154.31	0.068	568
Messalonskee Lake	Readfield	2915	150	2765	0.25	691	53.05	mod-sens	h	0.75	39.79	0.058	173
Messalonskee Lake	Mount Vernon	3830	300	3530	0.25	883	69.65	mod-sens	h	0.75	52.24	0.059	221
Messalonskee Lake	Sidney	6333	1500	4833	0.3	1450	115.2	mod-sens	h	0.75	86.39	0.060	362
Mid Basin, Damariscotta Lake	Nobleboro	4047	405	3642	0.3	1093	75.27	mod-sens	h	0.75	56.45	0.051	273
Mid Basin, Damariscotta Lake	Jefferson	405	40	365	0.2	73	7.49	mod-sens	h	0.75	5.62	0.077	18
Middle Branch Pond	Alfred	207	90	117	0.2	23	1.65	mod-sens	m	1.00	1.65	0.071	6
Middle Pond	Waterford	39	20	19	0.25	5	0.39	mod-sens	h	0.75	0.29	0.062	1
Middle Pond	Lovell	79	5	74	0.2	15	0.81	mod-sens	h	0.75	0.61	0.041	4
Middle Range Pond	Poland	3170	300	2870	0.25	718	43.52	mod-sens	h	0.75	32.64	0.045	179
Middle Springy Pond	Clifton	69	35	34	0.2	7	0.79	mod-sens	m	1.00	0.79	0.116	2
Mill Pond	Deer Isle	429	64	365	0.25	91	4.63	mod-sens	m	1.00	4.63	0.051	23
Mill Pond	Washington	1008	40	968	0.2	194	7.18	mod-sens	m	1.00	7.18	0.037	48
Mill Pond	Lee	1596	175	1421	0.25	355	11.86	mod-sens	m	1.00	11.86	0.033	89
Mill Pond	New Vineyard	751	75	676	0.25	169	9.67	mod-sens	m	1.00	9.67	0.057	42
Mill Privilege Lake	Carroll Plt	2614	300	2314	0.15	347	17.08	mod-sens	m	1.00	17.08	0.049	87
Mill Privilege Lake	Lakeville	513	40	473	0.15	71	3.35	mod-sens	m	1.00	3.35	0.047	18
Mill Privilege Lake	Pukakon Twp	343	20	323	0.15	48	2.24	mod-sens	m	1.00	2.24	0.046	12
Millinocket Lake	T1R8 WELS	4190	200	3990	0.25	998	53.31	good	h	1.00	53.31	0.053	249
Millinocket Lake	T1R9 WELS	3165	500	2665	0.25	666	40.28	good	h	1.00	40.28	0.060	167
Milton Pond	Lebanon	931	110	821	0.25	205	9.06	mod-sens	m	1.00	9.06	0.044	51
Minnehonk Lake	Mount Vernon	1116	200	916	0.35	321	20.13	good	h	1.00	20.13	0.063	80
Mirror Lake	Camden	182	30	152	0.25	38	2.29	good	h	1.00	2.29	0.060	10
Mirror Lake	Rockport	753	175	578	0.2	116	9.48	mod-sens	h	0.75	7.11	0.062	29

Worksheet 1 - PPB calculations			
Project Name: Solar Fields - Parker Station			
Lake Watershed: Messalonskee Lake			
Town: Belgrade			
Standard Calculations			
Watershed per acre phosphorus budget (Appendix C)	PAPB	0.068	lbs P/acre/year
Total acreage of development parcel:	TA	24.9	acres
NWI wetland acreage:	WA	0.69	acres
Steep slope acreage:	SA	0	acres
Project acreage: $A = TA - (WA + SA)$	A	24.21	acres
Project Phosphorus Budget: $PPB = P \times A$	PPB	1.64628	lbs P/year
Small Watershed Adjustment			
If Project Acreage (A) is greater than the threshold acreage for the small watershed threshold (SWT, from pertinent lake and town info in the table in Appendix C), calculate an alternative PPB using the analysis below and use this value if it is less than the the Standard Calculation PPB.			
Small Watershed Threshold (Appendix C):	SWT	568	acres
Project acreage:	A	24.9	acres
Allowable increase in town's share of annual phosphorus load to lake (Appendix C):	FC	154.31	lbs P/year
Area available for development (Appendix C):	AAD	10026	acres
Ratio of A to AAD ($R=A/AAD$)	R	N/A	
Project Phosphorus Budget			
If $R < 0.5$, $PPB = [(FC \times R)/2] + [FC/4]$	PPB	N/A	lbs P/year
If $R > 0.5$, $PPB = FC \times R$	PPB	N/A	lbs P/year

Worksheet 2

Pre-PPE and Post-PPE Calculations

Calculate phosphorus export from development for before and after treatment

Use as many sheets as needed for each development type (commercial, roads, residential lots, etc.)

Project name: Solar Fields - Parker Station

Development type: Commercial

Sheet # 1 of 1

Land Surface Type or Lot #(s) with description	Acres or # of lots	Export Coefficient from Table 3.1 Table 3.2	Pre- treatment Algal Av. P Export (lbs P/year)	Treatment Factor for BMP(s) from Chapter 6	Post- treatment Algal Av. P Export (lbs P/year)	Description of BMPs
Power Station	0.00792	0.5	0.00396006	1	0.00396006	No BMP
Crushed Rock	0.03818	0.3	0.01145317	1	0.01145317	No BMP
Gravel Road (Treated)	0.12121	1.75	0.21212121	0.4	0.08484848	Meadow Buffer Sta 0+50 to 3+80
Gravel Road (Untreated)	0.27748	1.75	0.48558884	1	0.48558884	No BMP
			0	1	0	
			0	1	0	
			0	1	0	
			0	1	0	
			0	1	0	
			0	1	0	
			0	1	0	
		Total Pre-PPE (lbs P/year)	0.71312328	Total PostPPE (lbs P/year)	0.58585055	

WORKSHEET 4 - PROJECT PHOSPHORUS EXPORT SUMMARY

Summarizing the project's algal available phosphorus export (PPE)

Project Name: Solar Fields - Parker Station

Project Phosphorus Budget - Worksheet 1	PPB	1.65	lbs P/year
Total Pre-Treatment Phosphorus Export - Worksheet 2	Pre-PPE	0.71	lbs P/year
Total Post-Treatment Phosphorus Export - Worksheet 2	Post-PPE	0.59	lbs P/year
Total Phosphorus Mitigation Credit - Worksheet 3	TMC	0.00	lbs P/year
Project Phosphorus Export (Post-PPE - TMC)	PPE	0.59	lbs P/year

Is the Project Phosphorus Export \leq the Project Phosphorus Budget? ($PPE \leq PPB$)

<p>If YES, PPE is less than or equal to PPB and the project meets its phosphorus budget.</p> <p>If NO, PPE is greater than PPB, more reduction in phosphorus export is required or the payment of a compensation fee may be an option</p>	YES
The amount of phosphorus that needs further treatment or compensation	lbs P/year

Has Project Phosphorus Export been sufficiently reduced?

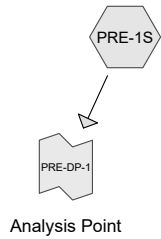
Is $(Pre-PPE - Post-PPE)/Pre-PPE$ greater than 0.60?

<p>If YES, in some watersheds the compensation fee is an available option.</p> <p>If NO, more treatment must be provided. PPE must be further reduced.</p>	
The post-treatment phosphorus export must be less than 40% of the pre-treatment export ($Post-PPE < 0.4 * Pre-PPE$)	%

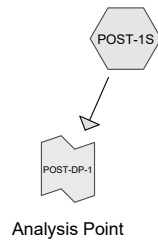
If the project is located in a watershed that is eligible for a compensation fee (or is a residential subdivision with buffers), a compensation fee may be appropriate as follows:

If Project Export has been reduced by greater than 60% and less than 75%, \$25,000 per pound minus \$833 per 1% Percent Export	
If Project Export has been reduced by greater than 75%, \$12,500 per pound minus \$500 per 1% Project Export	

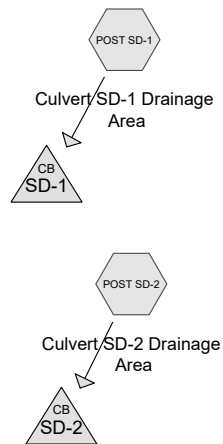
PRE-DEVELOPMENT



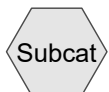
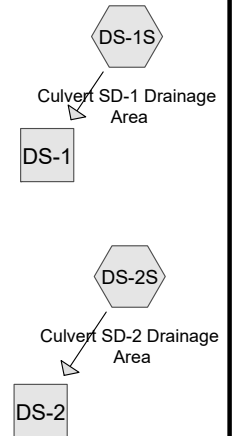
POST-DEVELOPMENT



CULVERT SIZING



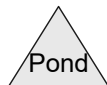
DITCH STABILIZATION



Subcat



Reach



Pond



Link

Routing Diagram for Solar Fields Belgrade - Stormwater Model

Prepared by TRC, Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 2-YR Rainfall=2.80"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 2

Summary for Subcatchment DS-1S: Culvert SD-1 Drainage Area

Runoff = 0.10 cfs @ 12.25 hrs, Volume= 0.011 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.80"

Area (ac)	CN	Description
0.129	78	Meadow, non-grazed, HSG D
0.129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment DS-2S: Culvert SD-2 Drainage Area

Runoff = 3.15 cfs @ 12.57 hrs, Volume= 0.476 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.80"

Area (ac)	CN	Description
1.530	71	Meadow, non-grazed, HSG C
2.297	78	Meadow, non-grazed, HSG D
1.956	70	Woods, Good, HSG C
0.261	77	Woods, Good, HSG D
0.087	79	Woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
0.185	96	Gravel surface, HSG C
6.868	75	Weighted Average
6.779		98.70% Pervious Area
0.089		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST SD-1: Culvert SD-1 Drainage Area

Runoff = 0.10 cfs @ 12.25 hrs, Volume= 0.011 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.80"

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 2-YR Rainfall=2.80"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 3

Area (ac)	CN	Description
0.129	78	Meadow, non-grazed, HSG D
0.129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST SD-2: Culvert SD-2 Drainage Area

Runoff = 3.15 cfs @ 12.57 hrs, Volume= 0.476 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.80"

Area (ac)	CN	Description
1.530	71	Meadow, non-grazed, HSG C
2.297	78	Meadow, non-grazed, HSG D
1.956	70	Woods, Good, HSG C
0.261	77	Woods, Good, HSG D
0.087	79	Woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
0.185	96	Gravel surface, HSG C
6.868	75	Weighted Average
6.779		98.70% Pervious Area
0.089		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST-1S:

Runoff = 9.37 cfs @ 12.84 hrs, Volume= 1.834 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.80"

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 2-YR Rainfall=2.80"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 4

Area (ac)	CN	Description
0.008	98	Unconnected pavement, HSG C
0.437	96	Gravel surface, HSG C
0.425	58	Meadow, non-grazed, HSG B
14.098	71	Meadow, non-grazed, HSG C
6.665	78	Meadow, non-grazed, HSG D
1.935	55	Woods, Good, HSG B
5.386	70	Woods, Good, HSG C
1.609	77	Woods, Good, HSG D
* 0.693	79	Wetland, woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
31.808	72	Weighted Average
31.711		99.70% Pervious Area
0.097		0.30% Impervious Area
0.008		8.25% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
54.9					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment PRE-1S:

Runoff = 9.30 cfs @ 12.85 hrs, Volume= 1.834 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.80"

Area (ac)	CN	Description
0.425	58	Meadow, non-grazed, HSG B
14.426	71	Meadow, non-grazed, HSG C
6.783	78	Meadow, non-grazed, HSG D
1.935	55	Woods, Good, HSG B
5.386	70	Woods, Good, HSG C
1.609	77	Woods, Good, HSG D
* 0.693	79	Wetland, woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
31.809	72	Weighted Average
31.720		99.72% Pervious Area
0.089		0.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
55.6					Direct Entry, See Tc Calculation Sheet

Solar Fields Belgrade - Stormwater Model

Prepared by TRC

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Type III 24-hr 2-YR Rainfall=2.80"

Printed 2020-05-04

Page 5

Summary for Reach DS-1:

Inflow Area = 0.129 ac, 0.00% Impervious, Inflow Depth = 0.99" for 2-YR event
Inflow = 0.10 cfs @ 12.25 hrs, Volume= 0.011 af
Outflow = 0.10 cfs @ 12.25 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.77 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.33 fps, Avg. Travel Time= 1.3 min

Peak Storage= 3 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 1.50' Flow Area= 6.4 sf, Capacity= 28.57 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.5 '/' Top Width= 6.50'
Length= 25.0' Slope= 0.0100 '/'
Inlet Invert= 319.55', Outlet Invert= 319.30'



Summary for Reach DS-2:

Inflow Area = 6.868 ac, 1.30% Impervious, Inflow Depth = 0.83" for 2-YR event
Inflow = 3.15 cfs @ 12.57 hrs, Volume= 0.476 af
Outflow = 3.15 cfs @ 12.59 hrs, Volume= 0.476 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.17 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 3.0 min

Peak Storage= 218 cf @ 12.59 hrs
Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 1.50' Flow Area= 12.4 sf, Capacity= 79.26 cfs

6.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.5 '/' Top Width= 10.50'
Length= 150.0' Slope= 0.0150 '/'
Inlet Invert= 304.50', Outlet Invert= 302.25'



Solar Fields Belgrade - Stormwater Model

Type III 24-hr 2-YR Rainfall=2.80"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 6

Summary for Pond SD-1:

Inflow Area = 0.129 ac, 0.00% Impervious, Inflow Depth = 0.99" for 2-YR event
 Inflow = 0.10 cfs @ 12.25 hrs, Volume= 0.011 af
 Outflow = 0.10 cfs @ 12.25 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.10 cfs @ 12.25 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Peak Elev= 319.91' @ 12.25 hrs

Flood Elev= 322.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	319.75'	15.0" Round Culvert L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 319.75' / 319.55' S= 0.0100 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.10 cfs @ 12.25 hrs HW=319.91' (Free Discharge)

↑1=Culvert (Barrel Controls 0.10 cfs @ 1.78 fps)

Summary for Pond SD-2:

Inflow Area = 6.868 ac, 1.30% Impervious, Inflow Depth = 0.83" for 2-YR event
 Inflow = 3.15 cfs @ 12.57 hrs, Volume= 0.476 af
 Outflow = 3.15 cfs @ 12.57 hrs, Volume= 0.476 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.15 cfs @ 12.57 hrs, Volume= 0.476 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Peak Elev= 305.80' @ 12.57 hrs

Flood Elev= 308.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	305.00'	24.0" Round Culvert L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 305.00' / 304.50' S= 0.0250 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=3.15 cfs @ 12.57 hrs HW=305.80' (Free Discharge)

↑1=Culvert (Inlet Controls 3.15 cfs @ 2.69 fps)

Summary for Link POST-DP-1: Analysis Point

Inflow Area = 31.808 ac, 0.30% Impervious, Inflow Depth = 0.69" for 2-YR event
 Inflow = 9.37 cfs @ 12.84 hrs, Volume= 1.834 af
 Primary = 9.37 cfs @ 12.84 hrs, Volume= 1.834 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 2-YR Rainfall=2.80"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 7

Summary for Link PRE-DP-1: Analysis Point

Inflow Area = 31.809 ac, 0.28% Impervious, Inflow Depth = 0.69" for 2-YR event
Inflow = 9.30 cfs @ 12.85 hrs, Volume= 1.834 af
Primary = 9.30 cfs @ 12.85 hrs, Volume= 1.834 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 10-YR Rainfall=4.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 8

Summary for Subcatchment DS-1S: Culvert SD-1 Drainage Area

Runoff = 0.22 cfs @ 12.24 hrs, Volume= 0.022 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.20"

Area (ac)	CN	Description
0.129	78	Meadow, non-grazed, HSG D
0.129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment DS-2S: Culvert SD-2 Drainage Area

Runoff = 7.32 cfs @ 12.54 hrs, Volume= 1.041 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.20"

Area (ac)	CN	Description
1.530	71	Meadow, non-grazed, HSG C
2.297	78	Meadow, non-grazed, HSG D
1.956	70	Woods, Good, HSG C
0.261	77	Woods, Good, HSG D
0.087	79	Woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
0.185	96	Gravel surface, HSG C
6.868	75	Weighted Average
6.779		98.70% Pervious Area
0.089		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST SD-1: Culvert SD-1 Drainage Area

Runoff = 0.22 cfs @ 12.24 hrs, Volume= 0.022 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.20"

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 10-YR Rainfall=4.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 9

Area (ac)	CN	Description
0.129	78	Meadow, non-grazed, HSG D
0.129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST SD-2: Culvert SD-2 Drainage Area

Runoff = 7.32 cfs @ 12.54 hrs, Volume= 1.041 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.20"

Area (ac)	CN	Description
1.530	71	Meadow, non-grazed, HSG C
2.297	78	Meadow, non-grazed, HSG D
1.956	70	Woods, Good, HSG C
0.261	77	Woods, Good, HSG D
0.087	79	Woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
0.185	96	Gravel surface, HSG C
6.868	75	Weighted Average
6.779		98.70% Pervious Area
0.089		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST-1S:

Runoff = 23.95 cfs @ 12.78 hrs, Volume= 4.246 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.20"

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 10-YR Rainfall=4.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 10

Area (ac)	CN	Description
0.008	98	Unconnected pavement, HSG C
0.437	96	Gravel surface, HSG C
0.425	58	Meadow, non-grazed, HSG B
14.098	71	Meadow, non-grazed, HSG C
6.665	78	Meadow, non-grazed, HSG D
1.935	55	Woods, Good, HSG B
5.386	70	Woods, Good, HSG C
1.609	77	Woods, Good, HSG D
* 0.693	79	Wetland, woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
31.808	72	Weighted Average
31.711		99.70% Pervious Area
0.097		0.30% Impervious Area
0.008		8.25% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
54.9					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment PRE-1S:

Runoff = 23.80 cfs @ 12.80 hrs, Volume= 4.246 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.20"

Area (ac)	CN	Description
0.425	58	Meadow, non-grazed, HSG B
14.426	71	Meadow, non-grazed, HSG C
6.783	78	Meadow, non-grazed, HSG D
1.935	55	Woods, Good, HSG B
5.386	70	Woods, Good, HSG C
1.609	77	Woods, Good, HSG D
* 0.693	79	Wetland, woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
31.809	72	Weighted Average
31.720		99.72% Pervious Area
0.089		0.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
55.6					Direct Entry, See Tc Calculation Sheet

Solar Fields Belgrade - Stormwater Model

Prepared by TRC

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Type III 24-hr 10-YR Rainfall=4.20"

Printed 2020-05-04

Page 11

Summary for Reach DS-1:

Inflow Area = 0.129 ac, 0.00% Impervious, Inflow Depth = 2.05" for 10-YR event
Inflow = 0.22 cfs @ 12.24 hrs, Volume= 0.022 af
Outflow = 0.22 cfs @ 12.24 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.02 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.36 fps, Avg. Travel Time= 1.2 min

Peak Storage= 5 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 1.50' Flow Area= 6.4 sf, Capacity= 28.57 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.5 '/' Top Width= 6.50'
Length= 25.0' Slope= 0.0100 '/'
Inlet Invert= 319.55', Outlet Invert= 319.30'



Summary for Reach DS-2:

Inflow Area = 6.868 ac, 1.30% Impervious, Inflow Depth = 1.82" for 10-YR event
Inflow = 7.32 cfs @ 12.54 hrs, Volume= 1.041 af
Outflow = 7.32 cfs @ 12.55 hrs, Volume= 1.041 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.94 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.03 fps, Avg. Travel Time= 2.4 min

Peak Storage= 373 cf @ 12.55 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 1.50' Flow Area= 12.4 sf, Capacity= 79.26 cfs

6.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.5 '/' Top Width= 10.50'
Length= 150.0' Slope= 0.0150 '/'
Inlet Invert= 304.50', Outlet Invert= 302.25'



Solar Fields Belgrade - Stormwater Model

Type III 24-hr 10-YR Rainfall=4.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 12

Summary for Pond SD-1:

Inflow Area = 0.129 ac, 0.00% Impervious, Inflow Depth = 2.05" for 10-YR event
 Inflow = 0.22 cfs @ 12.24 hrs, Volume= 0.022 af
 Outflow = 0.22 cfs @ 12.24 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.22 cfs @ 12.24 hrs, Volume= 0.022 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Peak Elev= 319.98' @ 12.24 hrs

Flood Elev= 322.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	319.75'	15.0" Round Culvert L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 319.75' / 319.55' S= 0.0100 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.22 cfs @ 12.24 hrs HW=319.98' (Free Discharge)

↑1=Culvert (Barrel Controls 0.22 cfs @ 2.14 fps)

Summary for Pond SD-2:

Inflow Area = 6.868 ac, 1.30% Impervious, Inflow Depth = 1.82" for 10-YR event
 Inflow = 7.32 cfs @ 12.54 hrs, Volume= 1.041 af
 Outflow = 7.32 cfs @ 12.54 hrs, Volume= 1.041 af, Atten= 0%, Lag= 0.0 min
 Primary = 7.32 cfs @ 12.54 hrs, Volume= 1.041 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Peak Elev= 306.29' @ 12.54 hrs

Flood Elev= 308.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	305.00'	24.0" Round Culvert L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 305.00' / 304.50' S= 0.0250 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=7.31 cfs @ 12.54 hrs HW=306.29' (Free Discharge)

↑1=Culvert (Inlet Controls 7.31 cfs @ 3.41 fps)

Summary for Link POST-DP-1: Analysis Point

Inflow Area = 31.808 ac, 0.30% Impervious, Inflow Depth = 1.60" for 10-YR event
 Inflow = 23.95 cfs @ 12.78 hrs, Volume= 4.246 af
 Primary = 23.95 cfs @ 12.78 hrs, Volume= 4.246 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Summary for Link PRE-DP-1: Analysis Point

Inflow Area = 31.809 ac, 0.28% Impervious, Inflow Depth = 1.60" for 10-YR event
Inflow = 23.80 cfs @ 12.80 hrs, Volume= 4.246 af
Primary = 23.80 cfs @ 12.80 hrs, Volume= 4.246 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 25-YR Rainfall=5.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 14

Summary for Subcatchment DS-1S: Culvert SD-1 Drainage Area

Runoff = 0.32 cfs @ 12.23 hrs, Volume= 0.031 af, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.20"

Area (ac)	CN	Description
0.129	78	Meadow, non-grazed, HSG D
0.129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment DS-2S: Culvert SD-2 Drainage Area

Runoff = 10.63 cfs @ 12.53 hrs, Volume= 1.495 af, Depth= 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.20"

Area (ac)	CN	Description
1.530	71	Meadow, non-grazed, HSG C
2.297	78	Meadow, non-grazed, HSG D
1.956	70	Woods, Good, HSG C
0.261	77	Woods, Good, HSG D
0.087	79	Woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
0.185	96	Gravel surface, HSG C
6.868	75	Weighted Average
6.779		98.70% Pervious Area
0.089		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST SD-1: Culvert SD-1 Drainage Area

Runoff = 0.32 cfs @ 12.23 hrs, Volume= 0.031 af, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.20"

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 25-YR Rainfall=5.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 15

Area (ac)	CN	Description
0.129	78	Meadow, non-grazed, HSG D
0.129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST SD-2: Culvert SD-2 Drainage Area

Runoff = 10.63 cfs @ 12.53 hrs, Volume= 1.495 af, Depth= 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.20"

Area (ac)	CN	Description
1.530	71	Meadow, non-grazed, HSG C
2.297	78	Meadow, non-grazed, HSG D
1.956	70	Woods, Good, HSG C
0.261	77	Woods, Good, HSG D
0.087	79	Woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
0.185	96	Gravel surface, HSG C
6.868	75	Weighted Average
6.779		98.70% Pervious Area
0.089		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST-1S:

Runoff = 35.98 cfs @ 12.76 hrs, Volume= 6.237 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.20"

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 25-YR Rainfall=5.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 16

Area (ac)	CN	Description
0.008	98	Unconnected pavement, HSG C
0.437	96	Gravel surface, HSG C
0.425	58	Meadow, non-grazed, HSG B
14.098	71	Meadow, non-grazed, HSG C
6.665	78	Meadow, non-grazed, HSG D
1.935	55	Woods, Good, HSG B
5.386	70	Woods, Good, HSG C
1.609	77	Woods, Good, HSG D
* 0.693	79	Wetland, woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
31.808	72	Weighted Average
31.711		99.70% Pervious Area
0.097		0.30% Impervious Area
0.008		8.25% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
54.9					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment PRE-1S:

Runoff = 35.68 cfs @ 12.78 hrs, Volume= 6.237 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.20"

Area (ac)	CN	Description
0.425	58	Meadow, non-grazed, HSG B
14.426	71	Meadow, non-grazed, HSG C
6.783	78	Meadow, non-grazed, HSG D
1.935	55	Woods, Good, HSG B
5.386	70	Woods, Good, HSG C
1.609	77	Woods, Good, HSG D
* 0.693	79	Wetland, woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
31.809	72	Weighted Average
31.720		99.72% Pervious Area
0.089		0.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
55.6					Direct Entry, See Tc Calculation Sheet

Solar Fields Belgrade - Stormwater Model

Prepared by TRC

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Type III 24-hr 25-YR Rainfall=5.20"

Printed 2020-05-04

Page 17

Summary for Reach DS-1:

Inflow Area = 0.129 ac, 0.00% Impervious, Inflow Depth = 2.88" for 25-YR event
Inflow = 0.32 cfs @ 12.23 hrs, Volume= 0.031 af
Outflow = 0.32 cfs @ 12.24 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.15 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.38 fps, Avg. Travel Time= 1.1 min

Peak Storage= 7 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 1.50' Flow Area= 6.4 sf, Capacity= 28.57 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.5 '/' Top Width= 6.50'
Length= 25.0' Slope= 0.0100 '/'
Inlet Invert= 319.55', Outlet Invert= 319.30'



Summary for Reach DS-2:

Inflow Area = 6.868 ac, 1.30% Impervious, Inflow Depth = 2.61" for 25-YR event
Inflow = 10.63 cfs @ 12.53 hrs, Volume= 1.495 af
Outflow = 10.63 cfs @ 12.54 hrs, Volume= 1.495 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.36 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.15 fps, Avg. Travel Time= 2.2 min

Peak Storage= 475 cf @ 12.54 hrs
Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 1.50' Flow Area= 12.4 sf, Capacity= 79.26 cfs

6.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.5 '/' Top Width= 10.50'
Length= 150.0' Slope= 0.0150 '/'
Inlet Invert= 304.50', Outlet Invert= 302.25'



Solar Fields Belgrade - Stormwater Model

Type III 24-hr 25-YR Rainfall=5.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 18

Summary for Pond SD-1:

Inflow Area = 0.129 ac, 0.00% Impervious, Inflow Depth = 2.88" for 25-YR event
Inflow = 0.32 cfs @ 12.23 hrs, Volume= 0.031 af
Outflow = 0.32 cfs @ 12.23 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min
Primary = 0.32 cfs @ 12.23 hrs, Volume= 0.031 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Peak Elev= 320.03' @ 12.23 hrs

Flood Elev= 322.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	319.75'	15.0" Round Culvert L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 319.75' / 319.55' S= 0.0100 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.31 cfs @ 12.23 hrs HW=320.03' (Free Discharge)

↑**1=Culvert** (Barrel Controls 0.31 cfs @ 2.32 fps)

Summary for Pond SD-2:

Inflow Area = 6.868 ac, 1.30% Impervious, Inflow Depth = 2.61" for 25-YR event
Inflow = 10.63 cfs @ 12.53 hrs, Volume= 1.495 af
Outflow = 10.63 cfs @ 12.53 hrs, Volume= 1.495 af, Atten= 0%, Lag= 0.0 min
Primary = 10.63 cfs @ 12.53 hrs, Volume= 1.495 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Peak Elev= 306.64' @ 12.53 hrs

Flood Elev= 308.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	305.00'	24.0" Round Culvert L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 305.00' / 304.50' S= 0.0250 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=10.61 cfs @ 12.53 hrs HW=306.64' (Free Discharge)

↑**1=Culvert** (Inlet Controls 10.61 cfs @ 3.85 fps)

Summary for Link POST-DP-1: Analysis Point

Inflow Area = 31.808 ac, 0.30% Impervious, Inflow Depth = 2.35" for 25-YR event
Inflow = 35.98 cfs @ 12.76 hrs, Volume= 6.237 af
Primary = 35.98 cfs @ 12.76 hrs, Volume= 6.237 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 25-YR Rainfall=5.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 19

Summary for Link PRE-DP-1: Analysis Point

Inflow Area = 31.809 ac, 0.28% Impervious, Inflow Depth = 2.35" for 25-YR event

Inflow = 35.68 cfs @ 12.78 hrs, Volume= 6.237 af

Primary = 35.68 cfs @ 12.78 hrs, Volume= 6.237 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 100-YR Rainfall=7.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 20

Summary for Subcatchment DS-1S: Culvert SD-1 Drainage Area

Runoff = 0.51 cfs @ 12.23 hrs, Volume= 0.050 af, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=7.20"

Area (ac)	CN	Description
0.129	78	Meadow, non-grazed, HSG D
0.129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment DS-2S: Culvert SD-2 Drainage Area

Runoff = 17.68 cfs @ 12.52 hrs, Volume= 2.476 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=7.20"

Area (ac)	CN	Description
1.530	71	Meadow, non-grazed, HSG C
2.297	78	Meadow, non-grazed, HSG D
1.956	70	Woods, Good, HSG C
0.261	77	Woods, Good, HSG D
0.087	79	Woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
0.185	96	Gravel surface, HSG C
6.868	75	Weighted Average
6.779		98.70% Pervious Area
0.089		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST SD-1: Culvert SD-1 Drainage Area

Runoff = 0.51 cfs @ 12.23 hrs, Volume= 0.050 af, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=7.20"

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 100-YR Rainfall=7.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 21

Area (ac)	CN	Description
0.129	78	Meadow, non-grazed, HSG D
0.129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST SD-2: Culvert SD-2 Drainage Area

Runoff = 17.68 cfs @ 12.52 hrs, Volume= 2.476 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=7.20"

Area (ac)	CN	Description
1.530	71	Meadow, non-grazed, HSG C
2.297	78	Meadow, non-grazed, HSG D
1.956	70	Woods, Good, HSG C
0.261	77	Woods, Good, HSG D
0.087	79	Woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
0.185	96	Gravel surface, HSG C
6.868	75	Weighted Average
6.779		98.70% Pervious Area
0.089		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.6					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment POST-1S:

Runoff = 61.91 cfs @ 12.75 hrs, Volume= 10.603 af, Depth= 4.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=7.20"

Solar Fields Belgrade - Stormwater Model

Type III 24-hr 100-YR Rainfall=7.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 22

Area (ac)	CN	Description
0.008	98	Unconnected pavement, HSG C
0.437	96	Gravel surface, HSG C
0.425	58	Meadow, non-grazed, HSG B
14.098	71	Meadow, non-grazed, HSG C
6.665	78	Meadow, non-grazed, HSG D
1.935	55	Woods, Good, HSG B
5.386	70	Woods, Good, HSG C
1.609	77	Woods, Good, HSG D
* 0.693	79	Wetland, woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
31.808	72	Weighted Average
31.711		99.70% Pervious Area
0.097		0.30% Impervious Area
0.008		8.25% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
54.9					Direct Entry, See Tc Calculation Sheet

Summary for Subcatchment PRE-1S:

Runoff = 61.32 cfs @ 12.77 hrs, Volume= 10.603 af, Depth= 4.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=7.20"

Area (ac)	CN	Description
0.425	58	Meadow, non-grazed, HSG B
14.426	71	Meadow, non-grazed, HSG C
6.783	78	Meadow, non-grazed, HSG D
1.935	55	Woods, Good, HSG B
5.386	70	Woods, Good, HSG C
1.609	77	Woods, Good, HSG D
* 0.693	79	Wetland, woods/grass comb., Good, HSG D
0.463	74	>75% Grass cover, Good, HSG C
0.019	98	Roofs, HSG C
0.070	98	Paved parking, HSG C
31.809	72	Weighted Average
31.720		99.72% Pervious Area
0.089		0.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
55.6					Direct Entry, See Tc Calculation Sheet

Solar Fields Belgrade - Stormwater Model

Prepared by TRC

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Type III 24-hr 100-YR Rainfall=7.20"

Printed 2020-05-04

Page 23

Summary for Reach DS-1:

Inflow Area = 0.129 ac, 0.00% Impervious, Inflow Depth = 4.66" for 100-YR event
Inflow = 0.51 cfs @ 12.23 hrs, Volume= 0.050 af
Outflow = 0.51 cfs @ 12.23 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.36 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.43 fps, Avg. Travel Time= 1.0 min

Peak Storage= 9 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 1.50' Flow Area= 6.4 sf, Capacity= 28.57 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.5 '/' Top Width= 6.50'
Length= 25.0' Slope= 0.0100 '/'
Inlet Invert= 319.55', Outlet Invert= 319.30'



Summary for Reach DS-2:

Inflow Area = 6.868 ac, 1.30% Impervious, Inflow Depth = 4.33" for 100-YR event
Inflow = 17.68 cfs @ 12.52 hrs, Volume= 2.476 af
Outflow = 17.66 cfs @ 12.53 hrs, Volume= 2.476 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.99 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 1.9 min

Peak Storage= 664 cf @ 12.53 hrs
Average Depth at Peak Storage= 0.64'
Bank-Full Depth= 1.50' Flow Area= 12.4 sf, Capacity= 79.26 cfs

6.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.5 '/' Top Width= 10.50'
Length= 150.0' Slope= 0.0150 '/'
Inlet Invert= 304.50', Outlet Invert= 302.25'



Solar Fields Belgrade - Stormwater Model

Type III 24-hr 100-YR Rainfall=7.20"

Prepared by TRC

Printed 2020-05-04

HydroCAD® 10.00-12 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Page 24

Summary for Pond SD-1:

Inflow Area = 0.129 ac, 0.00% Impervious, Inflow Depth = 4.66" for 100-YR event
 Inflow = 0.51 cfs @ 12.23 hrs, Volume= 0.050 af
 Outflow = 0.51 cfs @ 12.23 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.51 cfs @ 12.23 hrs, Volume= 0.050 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Peak Elev= 320.11' @ 12.23 hrs

Flood Elev= 322.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	319.75'	15.0" Round Culvert L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 319.75' / 319.55' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.50 cfs @ 12.23 hrs HW=320.11' (Free Discharge)

↑1=Culvert (Barrel Controls 0.50 cfs @ 2.57 fps)

Summary for Pond SD-2:

Inflow Area = 6.868 ac, 1.30% Impervious, Inflow Depth = 4.33" for 100-YR event
 Inflow = 17.68 cfs @ 12.52 hrs, Volume= 2.476 af
 Outflow = 17.68 cfs @ 12.52 hrs, Volume= 2.476 af, Atten= 0%, Lag= 0.0 min
 Primary = 17.68 cfs @ 12.52 hrs, Volume= 2.476 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Peak Elev= 307.75' @ 12.52 hrs

Flood Elev= 308.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	305.00'	24.0" Round Culvert L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 305.00' / 304.50' S= 0.0250 ' S= 0.0250 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=17.62 cfs @ 12.52 hrs HW=307.74' (Free Discharge)

↑1=Culvert (Inlet Controls 17.62 cfs @ 5.61 fps)

Summary for Link POST-DP-1: Analysis Point

Inflow Area = 31.808 ac, 0.30% Impervious, Inflow Depth = 4.00" for 100-YR event
 Inflow = 61.91 cfs @ 12.75 hrs, Volume= 10.603 af
 Primary = 61.91 cfs @ 12.75 hrs, Volume= 10.603 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Summary for Link PRE-DP-1: Analysis Point

Inflow Area = 31.809 ac, 0.28% Impervious, Inflow Depth = 4.00" for 100-YR event
Inflow = 61.32 cfs @ 12.77 hrs, Volume= 10.603 af
Primary = 61.32 cfs @ 12.77 hrs, Volume= 10.603 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs



Solar Fields Belgrade 2MW Solar Project *Time of Concentration Summary*

PROJECT NO.: 389694
 CALCULATED BY: A.DAVIDSON
 CHECKED BY: T.DANIELS
 DATE: 2020/04/27

Time of Concentration Equations:

1. Where $T_t := \frac{0.007 \cdot (N \cdot L)^{0.8}}{P_2^{0.5} \cdot S^{0.4}}$ from SCS TR-55 For Sheet Flow (300 feet or less)
2. Where $v := 20.3282 \cdot \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Shallow Concentrated Flow (Paved surfaces)
3. Where $T_t := \frac{L}{3600 \cdot V}$ from the SCS Upland Method *Channel Flow Chart* Travel time equation
4. Where $v := 16.1345 \cdot \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Shallow Concentrated Flow (Unpaved surfaces)
5. Where: $v = 2.5 \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Shallow Concentrated Flow (Meadows)
6. Where: $v = 5 \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Shallow Concentrated Flow (Woodland)
7. Where $v := 12 \cdot \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Channel Flow - Waterways and Swamps, No Channels
8. Where $v := 15 \cdot \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Channel Flow - Grassed Waterways and Roadside Ditches
9. Where $v := 21 \cdot \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Channel Flow - Small Tributary & Swamp w/Channels
10. Where $v := 35 \cdot \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Channel Flow - Large Tributary
11. Where $v := 60 \cdot \sqrt{S}$ from the SCS Upland Method *Channel Flow Chart* For Channel Flow - Main River
12. Where $v := \frac{1.49 \cdot R^{0.667} \cdot \sqrt{S}}{N}$ For Channel Flow - Culvert Flow
13. Where $P_2 = 2\text{-Year, 24 Hour Rainfall (in)}$ (Kennebec County, ME: $P_2 = 2.8$ inches)

Manning's Roughness Coefficients Table

Surface Description	n - value
Smooth surfaces	0.011
Crush Stone/Substation Yards	0.025
Fallow	0.050
Cultivated: Residue<=20%	0.060
Cultivated: Residue>=20%	0.170
Grass: Short	0.150
Grass: Dense	0.240
Grass: Bermuda	0.410
Range	0.130
Woods: Light underbrush	0.400
Woods: Dense underbrush	0.800

File:	Appendix B - Time of Concentration						Calculated By:	ARD	
PROJECT:	Solar Fields Belgrade 2MW Solar Project						Checked By:	TND	
TRc Proj. No.:	389694						Date:	2020-04-27	
Subcatchment:	Pre Dev 1S						Revised:		
Time of Concentration Determination Worksheet, SCS Methods									
	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Seg 6	Seg 7	Seg 8	Seg 9
SHEET FLOW									
Manning's No.	0.240								
Length, ft	100								
P2, in	2.8								
Slope, ft/ft	0.020								
T _t ¹ , hr	0.254								0.2543
SHALLOW CONCENTRATED FLOW									
Paved									
Length, ft									
Slope, ft/ft									
Velocity ² , ft/sec									
T _t ³ , hr									0.0000
Unpaved									
Length, ft									
Slope, ft/ft									
Velocity ² , ft/sec									
T _t ³ , hr									0.0000
Meadows									
Length, ft		518							
Slope, ft/ft		0.029							
Velocity ⁴ , ft/sec		0.4254							
T _t ³ , hr		0.338							0.3382
Woodland									
Length, ft									
Slope, ft/ft									
Velocity ⁵ , ft/sec									
T _t ³ , hr									0.0000
CHANNEL FLOW									
Waterways & Swamps, No Channels									
Length, ft			219		844	193			
Slope, ft/ft			0.009		0.017	0.073			
Velocity ⁶ , ft/sec			1.147		1.546	3.232			
T _t ³ , hr			0.053		0.152	0.017			0.2213
Grassed Waterways/Roadside Ditches									
Length, ft									
Slope, ft/ft									
Velocity ⁷ , ft/sec									
T _t , hr									0.0000
Small Tributary & Swamp w/Channels									
Length, ft						944			
Slope, ft/ft						0.013			
Velocity ⁸ , ft/sec						2.368			
T _t , hr						0.111			0.1108
Large Tributary									
Length, ft									
Slope, ft/ft									
Velocity ⁹ , ft/sec									
T _t , hr									0.0000
Culvert									
Diameter, ft				1.5					
Area, ft ²				1.76625					
Wetted Perimeter, ft				4.71					
Hydraulic Radius, R, ft				0.375					
Slope, ft/ft				0.010					
Manning's No.				0.024					
Velocity ¹¹ , ft/sec				3.22740808					
Length, L, ft				20					
T _t , hr				0.00172					0.0017
									HR 0.926
									Min 55.58

File:	Appendix B - Time of Concentration						Calculated By:	ARD		
PROJECT:	Solar Fields Belgrade 2MW Solar Project						Checked By:	TND		
TRc Proj. No.:	389694						Date:	2020-05-04		
Subcatchment:	Post Dev 1S						Revised:			
Time of Concentration Determination Worksheet, SCS Methods										
	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Seg 6	Seg 7	Seg 8	Seg 9	
SHEET FLOW										
Manning's No.	0.240									
Length, ft	100									
P2, in	2.8									
Slope, ft/ft	0.020									
T _t ¹ , hr	0.254									0.2543
SHALLOW CONCENTRATED FLOW										
Paved										
Length, ft			19							
Slope, ft/ft			0.026							
Velocity ² , ft/sec			3.2977							
T _t ³ , hr			0.002							0.0016
Unpaved										
Length, ft										
Slope, ft/ft										
Velocity ² , ft/sec										
T _t ³ , hr										0.0000
Meadows										
Length, ft		257		242						
Slope, ft/ft		0.025		0.033						
Velocity ⁴ , ft/sec		0.3976		0.4545						
T _t ³ , hr		0.180		0.148						0.3274
Woodland										
Length, ft										
Slope, ft/ft										
Velocity ⁵ , ft/sec										
T _t ³ , hr										0.0000
CHANNEL FLOW										
Waterways & Swamps, No Channels										
Length, ft					219		844	193		
Slope, ft/ft					0.014		0.015	0.073		
Velocity ⁶ , ft/sec					1.404		1.460	3.232		
T _t ³ , hr					0.043		0.161	0.017		0.2204
Grassed Waterways/Roadside Ditches										
Length, ft										
Slope, ft/ft										
Velocity ⁷ , ft/sec										
T _t , hr										0.0000
Small Tributary & Swamp w/Channels										
Length, ft									944	
Slope, ft/ft									0.013	
Velocity ⁸ , ft/sec									2.368	
T _t , hr									0.111	0.1108
Large Tributary										
Length, ft										
Slope, ft/ft										
Velocity ⁹ , ft/sec										
T _t , hr										0.0000
Culvert										
Diameter, ft						2				
Area, ft ²						3.14				
Wetted Perimeter, ft						6.28				
Hydraulic Radius, R, ft						0.5				
Slope, ft/ft						0.025				
Manning's No.						0.024				
Velocity ¹¹ , ft/sec						6.18241315				
Length, L, ft						20				
T _t , hr						0.00090				0.0009
										HR 0.915
										Min 54.92



Description: This calculation determines appropriate outlet stabilization for a culvert or channel based on the selected design storm. Reference: NH DES Stormwater Manual Vol. 2

 =Input Value
 =Calculated

Givens:

L_a = Length of Apron Required, ft
 Q = Discharge from Design Storm, cfs
 D_o = Culvert Diameter or Channel Width, ft
 TW = Tailwater Depth, ft
 W_1 = Width of Apron Required at Discharge, ft
 W_2 = Width of Apron Required at Outlet, ft
 D_{50} = Required Diameter of Rip-Rap, ft

Equations:

$$L_a = \frac{1.8Q}{1.50D_o} + 7D_o \quad \text{When } TW < 0.5D_o$$

$$L_a = \frac{3.0Q}{1.50D_o} + 7D_o \quad \text{When } TW > 0.5D_o$$

$$W_1 = 3D_o$$

$$W_2 = 3D_o + L_a \quad \text{When } TW < 0.5D_o$$

$$W_2 = 3D_o + 0.4L_a \quad \text{When } TW > 0.5D_o$$

$$D_{50} = (0.02Q^{1/3}) / (TW * D_o)$$

Input:

Q = 0.32 cfs 25YR STORM EVENT @ Culvert SD-1 OUTLET
 D_o = 1.25 ft
 TW = 0.24 ft

Output:

	TW <0.5D _o	TW >0.5D _o
L_a =	9.1 ft	L_a = NA ft
W_1 =	3.8 ft	W_1 = NA ft
W_2 =	12.8 ft	W_2 = NA ft
D_{50} =	0.0 ft	D_{50} = NA ft

Attachment C: Construction and Post-Construction Stormwater Inspection & Maintenance Log Examples

STORMWATER MANAGEMENT SYSTEM: INSPECTION & MAINTENANCE LOG				
	SCHEDULE		INITIALS & DATE	COMMENTS
	BIANNUAL	MAINTENANCE		
REVEGETATED AREAS AND EMBANKMENTS				
Inspect revegetated areas and embankments				
Replant bare areas or areas with sparse growth		As Required		
Armor areas with rill erosion with an appropriate lining		As Required		
DRAINAGE CONVEYANCE SYSTEMS				
Inspect swales and areas of concentrated flow for evidence of erosion, debris, woody growth, and excessive sediment accumulation				
Remove any obstructions and accumulated sediments or debris		As Required		
Control vegetated growth and woody vegetation (as allowed)		As Required		
Repair any erosion of the swale lining		As Required		
Mow vegetated swales (as allowed)		As Required		
Clean-out any accumulation of sediment		As Required		
Remove woody vegetation growing through rip-rap		As Required		
Repair any slumping side slopes		As Required		
Replace rip-rap where underlying filter fabric is showing or where stones have dislodged		As Required		
CULVERTS				
Inspect Culvert inlets, outlets, and armoring				
Remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit		As Required		
Repair any erosion damage at the culvert's inlet and outlet		As Required		
ACCESS ROAD SURFACES				
Inspect access road surfaces and shoulders for erosion, false ditches, rutting, or excess accumulation of fines that could impede water flow				
Remove excess fines either manually or with a front-end loader		As Required		
Re-grade roads and shoulders		As Required		
VEGETATED BUFFERS				
Inspect vegetated buffers for existing or developing erosion, rutting, debris, unwanted vegetation				
Correct any erosion/rutting and/or remove debris		As Required		
MAINTENANCE NEEDED AND WHEN:				

CONSTRUCTION STORMWATER SITE INSPECTION REPORT

Solar Fields Parker Station Solar 2.0 MW Solar Array

General Information			
Project Name	Solar Fields Parker Station 2.0 MW Solar Array		
Permit No.		Location	Belgrade, ME
Date of Inspection		Start/End Time	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Describe present phase of construction			
Type of Inspection: <input type="checkbox"/> Regular <input type="checkbox"/> Pre-storm event <input type="checkbox"/> During storm event <input type="checkbox"/> Post-storm event			
Weather Information			
Has there been a storm event since the last inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide: Storm Start Date & Time: Storm Duration (hrs): Approximate Amount of Precipitation (in):			
Weather at time of this inspection? <input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Rain <input type="checkbox"/> Sleet <input type="checkbox"/> Fog <input type="checkbox"/> Snowing <input type="checkbox"/> High Winds <input type="checkbox"/> Other: Temperature:			
Have any discharges occurred since the last inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe:			
Are there any discharges at the time of inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe:			

Site-specific BMPs

- Number the structural and non-structural BMPs identified in your Stormwater Management Report on your site map and list them below (add as many BMPs as necessary). Carry a copy of the numbered site map with you during your inspections. This list will ensure that you are inspecting all required BMPs at your site.
- Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
1		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
9		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes

Overall Site Issues

- Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	Are perimeter controls and sediment barriers adequately installed?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	Are discharge points and receiving waters free of any sediment deposits?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	Are storm drain inlets properly protected?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5	Is the construction exit preventing sediment from being tracked into the street?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	Is trash/litter from work areas collected and placed in covered dumpsters?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
7	Are vehicle and equipment cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8	Are materials that are potential stormwater contaminants stored inside or under cover?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
9	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10	(Other)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

Non-Compliance

Describe any incidents of non-compliance not described above:

CERTIFICATION STATEMENT

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

Print name and title: _____

Signature: _____ Date: _____

Attachment D: Example Stormwater Buffer Deed Restriction

DECLARATION OF RESTRICTIONS

(Forested Buffer, Limited Disturbance)

THIS DECLARATION OF RESTRICTIONS is made this _____ day of _____, 20____,
by _____, _____,
(name) (street address)
_____, _____ County, Maine, _____, (herein referred to as the
(city or town) (county) (zip code)
"Declarant"), pursuant to a permit received from the Maine Department of Environmental Protection under
the Stormwater Management Law, to preserve a buffer area on a parcel of land near
_____.
(road name) (known feature and/or town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(town)
described in a deed from _____ to _____ dated
(name) (name of Declarant)
_____, 20____, and recorded in Book _____ Page _____ at the _____ County
Registry of Deeds, herein referred to as the "property"; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a
portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows: (Note:
Insert description of restricted buffer area location here)

WHEREAS, pursuant to the Stormwater Management Law, 38 M.R.S. Section 420-D and Chapter 500 of
rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"),
Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set
forth herein and has agreed that these restrictions may be enforced by the Maine Department of
Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be
held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set
forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties
having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs,
personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted
Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant
Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express,
shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to
be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set
forth.

- 1. Restrictions on Restricted Buffer Area.** Unless the owner of the Restricted Buffer Area, or any
successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must
remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and
absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit

issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.

- a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material may be placed, stored or dumped on the Restricted Buffer Area, nor may the topography of the area be altered or manipulated in any way;
- b. Any removal of trees or other vegetation within the Restricted Buffer Area must be limited to the following:
 - (i) No purposefully cleared openings may be created and an evenly distributed stand of trees and other vegetation must be maintained. An "evenly distributed stand of trees" is defined as maintaining a minimum rating score of 24 points in any 25 foot by 50 foot rectangle (1,250 square feet) area, as determined by the rating scheme in Table 11:

**Table 11.
Point System for Determining an Evenly
Distributed Stand of Trees**

Diameter of tree at 4½ feet above ground level	Points
2 - 4 inches	1
4 - 8 inches	2
8 - 12 inches	4
>12 inches	8

Where existing trees and other vegetation result in a rating score less than 24 points, no trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;

- (ii) No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;
- c. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole (whether constructed of wood, steel or other materials) and appurtenant equipment such as guys and guy anchors, or fence;
- d. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area;
- e. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if

such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. **Enforcement.** The MDEP may enforce any of the Restrictions set forth in Section 1 above.
3. **Binding Effect.** The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.
4. **Amendment.** Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.
5. **Effective Provisions of Declaration.** Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.
6. **Severability.** Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.
7. **Governing Law.** This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

(NAME)

STATE OF MAINE _____ County, _____, 20__.
(County) (date)

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

Notary Public

DECLARATION OF RESTRICTIONS

(Forested Buffer, No Disturbance)

THIS DECLARATION OF RESTRICTIONS is made this _____ day of _____, 20____,
by _____, _____,
(name) (street address)
_____, _____ County, Maine, _____, (herein referred to as the
(city or town) (county) (zip code)
"Declarant", pursuant to a permit received from the Maine Department of Environmental Protection under
the Stormwater Management Law, to preserve a buffer area on a parcel of land near
_____, _____.
(road name) (known feature and/or town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(town)
described in a deed from _____ to _____, dated
(name) (name of Declarant)
_____, 20____, and recorded in Book ____ Page ____ at the _____ County
Registry of Deeds, herein referred to as the "property"; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a
portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows: (Note:
Insert description of restricted buffer location here)

WHEREAS, pursuant to the Stormwater Management Law, 38 M.R.S. Section 420-D and Chapter 500 of
rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"),
Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set
forth herein and has agreed that these restrictions may be enforced by the Maine Department of
Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be
held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set
forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties
having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs,
personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted
Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant
Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express,
shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to
be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set
forth.

1. **Restrictions on Restricted Buffer Area.** Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.
 - a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Restricted Buffer Area, nor shall the topography of the area be altered or manipulated in any way;
 - b. No trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;
 - c. No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;
 - d. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence (whether constructed of wood, steel or other materials) and appurtenant equipment such as guys and guy anchors;
 - e. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area;
 - f. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. **Enforcement.** The MDEP may enforce any of the Restrictions set forth in Section 1 above.
3. **Binding Effect.** The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.
4. **Amendment.** Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.

5. **Effective Provisions of Declaration.** Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.
6. **Severability.** Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.
7. **Governing Law.** This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

(NAME)

STATE OF MAINE, _____ County, dated _____, 20__.
(County)

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

Notary Public

DECLARATION OF RESTRICTIONS

(Non-Wooded Meadow Buffer)

THIS DECLARATION OF RESTRICTIONS is made this _____ day of _____, 20____, by

_____, _____
(name) (street address)
_____, _____ County, Maine, _____, (herein referred to as the
(city or town) (county) (zip code)

"Declarant"), pursuant to a permit received from the Maine Department of Environmental Protection under the Stormwater Management Law, to preserve a buffer area on a parcel of land near

_____, _____
(road name) (known feature and/or town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(town)

described in a deed from _____ to _____, dated
(name) (name of Declarant)

_____, 20____, and recorded in Book ____ Page ____ at the _____ County
Registry of Deeds, herein referred to as the "property"; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows: (Note: Insert description of restricted buffer location here)

WHEREAS, pursuant to the Stormwater Management Law, 38 M.R.S. Section 420-D and Chapter 500 of rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"), Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1. **Restrictions on Restricted Buffer Area.** Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.
 - a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Restricted Buffer Area, nor may the topography or the natural mineral soil of the area be altered or manipulated in any way;
 - b. A dense cover of grassy vegetation must be maintained over the Restricted Buffer Area, except that shrubs, trees and other woody vegetation may also be planted or allowed to grow in the area. The Restricted Buffer Area may not be maintained as a lawn or used as a pasture. If vegetation in the Restricted Buffer Area is mowed, it may be mown no more than two times per year.
 - c. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence (whether constructed of wood, steel or other materials) and appurtenant equipment such as guys and guy anchors;
 - d. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area, except for vehicles used in mowing;
 - e. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. **Enforcement.** The MDEP may enforce any of the Restrictions set forth in Section 1 above.
3. **Binding Effect.** The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.
4. **Amendment.** Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.
5. **Effective Provisions of Declaration.** Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.

6. **Severability.** Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.
7. **Governing Law.** This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

(NAME)

STATE OF MAINE, _____, County, dated _____, 20__ .
(County)

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

Notary Public

Fred Rancourt
11 Lens Ave
Portsmouth, NH 03801
603-436-3462
susanfredrancourt@gmail.com

5/14/2021

Planning Board
Town of Belgrade, Maine

Gentlemen:

This letter refers to my approved Building Permit #21-15 attached. I am requesting to relocate the 10 x 16 Shed as shown on the revised Site plan attached. Purpose of this change is to move the shed out from under the power line. This was a concern brought to my attention by the planning board. I request Planning Board approval of the new location which is 123 ft from Lake, 22 ft from northerly property line and 61 ft from westerly property line as shown on revised Site plan.

Sincerely,

Frederic Rancourt

TOWN OF BELGRADE BUILDING PERMIT

ANY DEVIATION FROM PERMIT
REQUIRES APPROVAL BY
PB ☒ / CEO ☐

Number 15
Map # 47 Lot # 2
Application # 21-15

Issued to: Frederic Rancourt

Mailing Address For Permit: 11 Lens Ave, Portsmouth NH 03801

For Following Uses: Construct a 10'x30' deck on side of house & construct 10'x16' shed

Location Of Property: 93 Ambrose Cove Rd : Messalonskee Lake

The following conditions and safeguards are prescribed as authorized in Section 12 B.7 of the Ordinance.
Any Violation of these conditions shall be a violation of the ordinance.

1. Manage stormwater run-off from new or expanded structures in accordance
2. with section 15(1) of the Belgrade SZO and Maine DEP's Best Management
3. Practices as outlined in the Conservation Practices for Homeowner's
4. publication. Such measures are to be put in place prior to building use.
5.

Issue Date: 04/13/2021

Expiration Date: 04/13/2022

CEO: _____

PLEASE NOTE:

CONTACT CODE ENFORCEMENT OFFICER
WHEN PROJECT HAS BEEN COMPLETED
FOR FINAL INSPECTION.

CALL: HM: 495-3868 OR OFFICE: 495-2258

Planning Board: _____

George Sull

41B83EDEA4F34E0

DocuSigned by:

DocuSigned by:

Dora Fungne

0402929691C1478...

E58A053853E244F...

Fee: \$52.60 paid

☒ Shoreland
 Certified Contractor
 Number # _____
☐ Non Shoreland

Town of Belgrade, Maine
 APPLICATION FOR PERMIT

990 Augusta Road Belgrade Me 04917
 207-495-2258
 Application # 21-15
 Map# 47 Lot# 2
 Permit# 15

Date Logged 3/29/21 Date Rec'd by PB/CEO 3/29/21 \$ 52.00 Fee Paid Receipt# 1440

003-969-5325

- Applicant:
 Name Frederic Rancourt
 Mailing Addr 11 Lens Ave. Portsmouth
 State/Zip NH 03801 Phone# 603-436-3462
- Owner (if other than applicant):
 Name _____
 Mailing Addr _____
 State/Zip _____ Phone# _____
- Specific location of property 93 Ambrose Cove Rd. Map# 47 Lot# 02
 Name of Lake/Pond/Stream (if applicable) Messalonskee Lake
- Current use of property (check all that apply)
☒ Residential/Recreational; _____ Individual Private Campsite; _____ Commercial; _____ Industrial; _____ Other
- Proposed construction or change in use: To construct a 10' x 30' Deck on side of house and to construct a 10' x 16' shed as shown on attached drawing.
- Existing sewage disposal system type and capacity: 1000 Gal. Concrete Tank with pump to Leach Field.
 Present number of bedrooms 3; Bedrooms to be added under this application 0 Installed 9/2001.
 When did you purchase the property within Shoreland Zone? 4/1985 (month/year) If after 11/6/18, attach copy of septic system inspection report documenting it is not malfunctioning.
- Total lot area 18,000 sq. ft.; Lot area within the Shoreland Zone 18,000 sq. ft.
- Square footage of unvegetated surface within shoreland zone including all structures, driveways, parking, walkways and patios. 1224 sq. ft.
- What is the total area of cleared openings of woody vegetation (Sqft) 10,000 sq. ft.
- Total number of structures on the lots 1. A site plan to-scale MUST accompany this application and be prepared in accordance with the requirements on the attached Instruction Sheet (Item #10 on the Instruction Sheet). All required attachments must accompany this application.

Present Structure Square Footage 1160 sq. ft.
 Proposed Structure Square Footage Deck = 300 sq. ft. Shed = 160 sq. ft.

*Required only for structures within Shoreland Zone

I/We have obtained and understand the requirements of all Town of Belgrade Ordinance which apply to the proposed construction or change of use. The undersigned applies for a permit to build, alter or improve existing structure(s) or grounds as stated above on this application and portrayed on the attachments. The information provided is true and correct.

Signature: Frederic Rancourt 3/25/21

Signature: _____

There may be additional Federal, State or local permits required depending on the nature of the project.

TOWN USE ONLY 3-0

DECISION: ☒ APPROVE _____ DISAPPROVED

Conditions Manage stormwater run-off from new or expanded structures in accordance with section 15(f) of the Belgrade SDO and ME DEP's Best Management Practices as outlined in the Conservation Practices for Homeowners publication. Such measures due to be put in place prior to building use.

Date: 4/13/2021 PB ☒ CEO _____

DocuSigned by:
 Signatures:

George Sul

DocuSigned by:

Dora Funguel

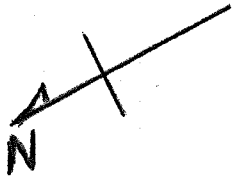
DocuSigned by:

Ruth Baker

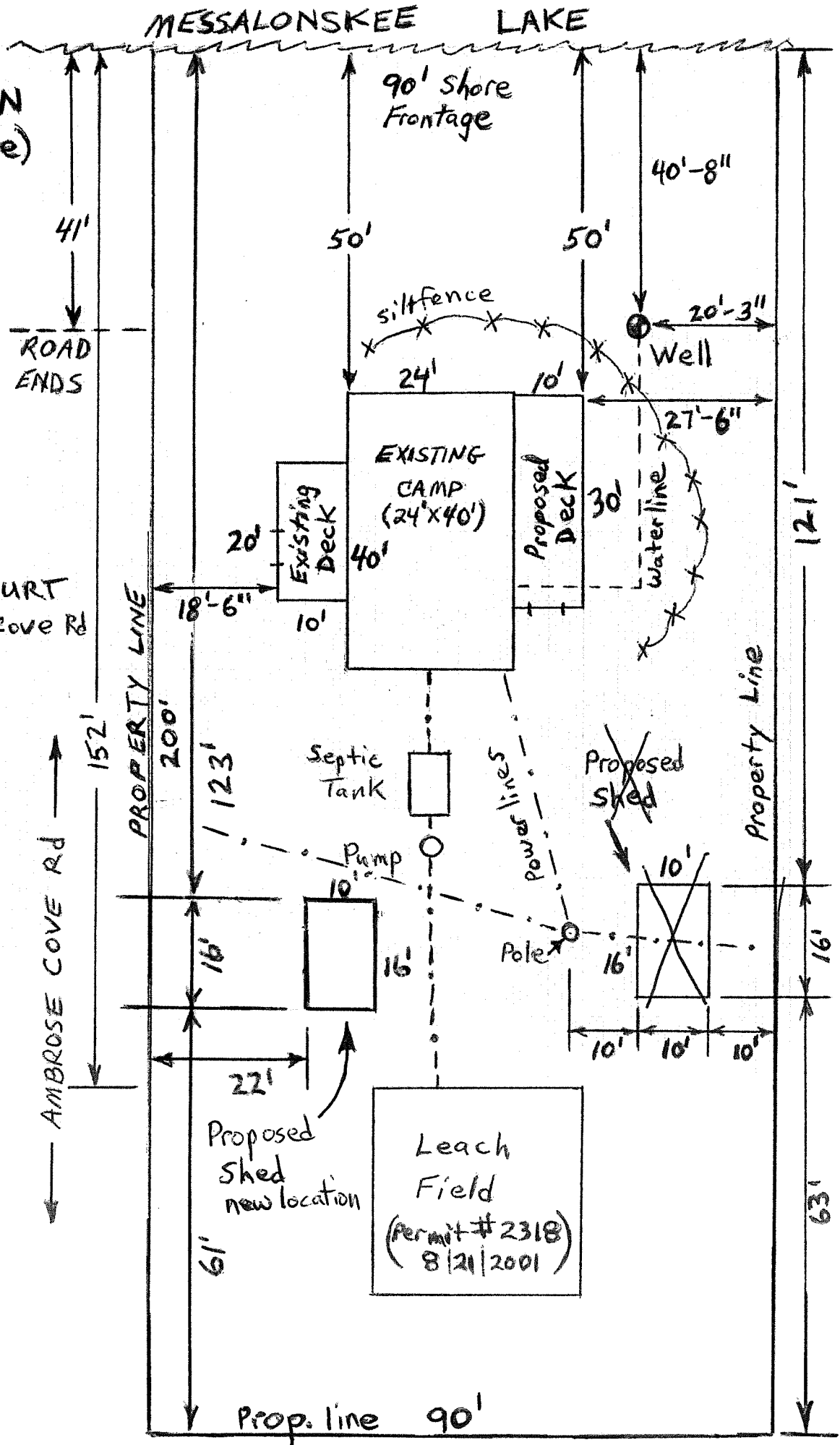
DB02929691C1478...

SITE PLAN
(to-scale)

Scale:
 $\frac{1}{2}'' = 10'$



FRED RANCOURT
93 Ambrose Cove Rd



Memo

To: Planning Board
From: Gary Fuller, Code Enforcement Officer
Date: 5-25-2021
Re: John & Lisa Veilleux shoreland zoning application
37 Parchill Point Rd, Belgrade
Great Pond, Map 12 Lot 4

☐ Non-conforming lot

☒ Non-conforming structure

Missing info?

Issues involved in this application include:

- 1) Expansion of a non-conforming structure
- 2)

I would encourage you to focus on:

- Beyond 75 the maximum size is 1500 sq. feet most of this structure is outside the 100 ft. setback.
- There is little no soil disturbance for this addition as it is proposed to go on posts and pads

Questions you might want the applicant to address include:

I would recommend you approve/reject this application based on ...

Approve

☒ Shoreland
Certified Contractor
Number # Owner
☐ Non Shoreland

Town of Belgrade, Maine
APPLICATION FOR PERMIT

990 Augusta Road Belgrade Me 04917

207-495-2258

Application # 21-21
Map# 12 Lot# 7
Permit# 21

Date Logged 3/31/21 Date Rec'd by PB/CEO 42.00 \$ 25.00 Fee Paid 67.20 Receipt# 2099

1. Applicant:

Name John + Lisa Neill
Mailing Addr 19 Astor Lane Yarmouth
State/Zip ME 04096 Phone# 207-632-9886

2. Owner (if other than applicant):

Name _____
Mailing Addr _____
State/Zip _____ Phone# _____

3. Specific location of property 37 Parichill Point Rd. Belgrade Map# 12 Lot# 4
Name of Lake/Pond/Stream (if applicable) Great Pond

4. Current use of property (check all that apply)

☒ Residential/Recreational; _____ Individual Private Campsite; _____ Commercial; _____ Industrial; _____ Other

5. Proposed construction or change in use: Construct 24x20 addition w/ incorporated 24x10 porch/Screenroom to be attached to existing Camp - No clearing necessary.

6. Existing sewage disposal system type and capacity: New in spring 2021 (permit approved) - 3 BR 1000 gal
Present number of bedrooms 1; Bedrooms to be added under this application 2 Concrete tank w/ leach field
When did you purchase the property within Shoreland Zone? 7/31/2007 (month/year) If after 11/6/18, attach copy of septic system inspection report documenting it is not malfunctioning. (see permit on file)

7. Total lot area 206x250' = 50,000 Sq. ft.; Lot area within the Shoreland Zone All

8. Square footage of unvegetated surface within shoreland zone including all structures, driveways, parking, walkways and patios. 1251 sq. ft. 1000 Sq. feet (existing Camp footprint + shed)

9. What is the total area of cleared openings of woody vegetation (Sqft) 3,000 Sq. feet

10. Total number of structures on the lots 2. A site plan to-scale MUST accompany this application and be prepared in accordance with the requirements on the attached Instruction Sheet (Item #10 on the Instruction Sheet). All required attachments must accompany this application.

Present Structure Square Footage 840 existing Camp 120 sq. feet for shed (+100 feet in Shoreland)
Proposed Structure Square Footage 480 + 240 Screen room

*Required only for structures within Shoreland Zone

I/We have obtained and understand the requirements of all Town of Belgrade Ordinance which apply to the proposed construction or change of use. The undersigned applies for a permit to build, alter or improve existing structure(s) or grounds as stated above on this application and portrayed on the attachments. The information provided is true and correct.

Signature: [Signature] Signature: _____

There may be additional Federal, State or local permits required depending on the nature of the project.

TOWN USE ONLY

DECISION: _____ APPROVE _____ DISAPPROVED

Conditions _____

Date: _____ PB _____ CEO _____

Signatures: _____

632-9886

Veilux Addition Site Plan - 37 Parkhill Point Rd., Belgrade, MS

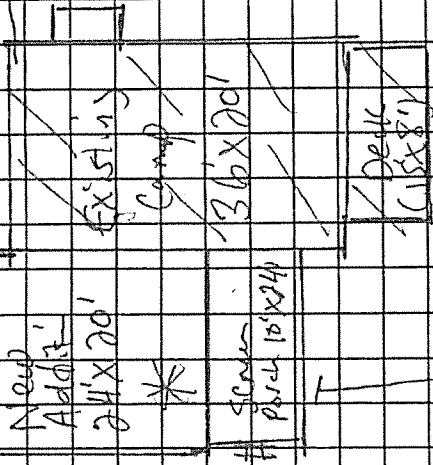
Submitted Permit Application

March 2001

Scale: 1" = 20'

New Landfield
spring pool

* See Addition
Building Plan
Attached



200' Frontage

Great Pond

Graph Paper Template Copyright © 2014 Dutch Renaissance Press LLC

VEILLEUX ADDITION PERMIT APPLICATION AND PLAN

37 PARKHILL POINT ROAD

BELGRADE, MAINE

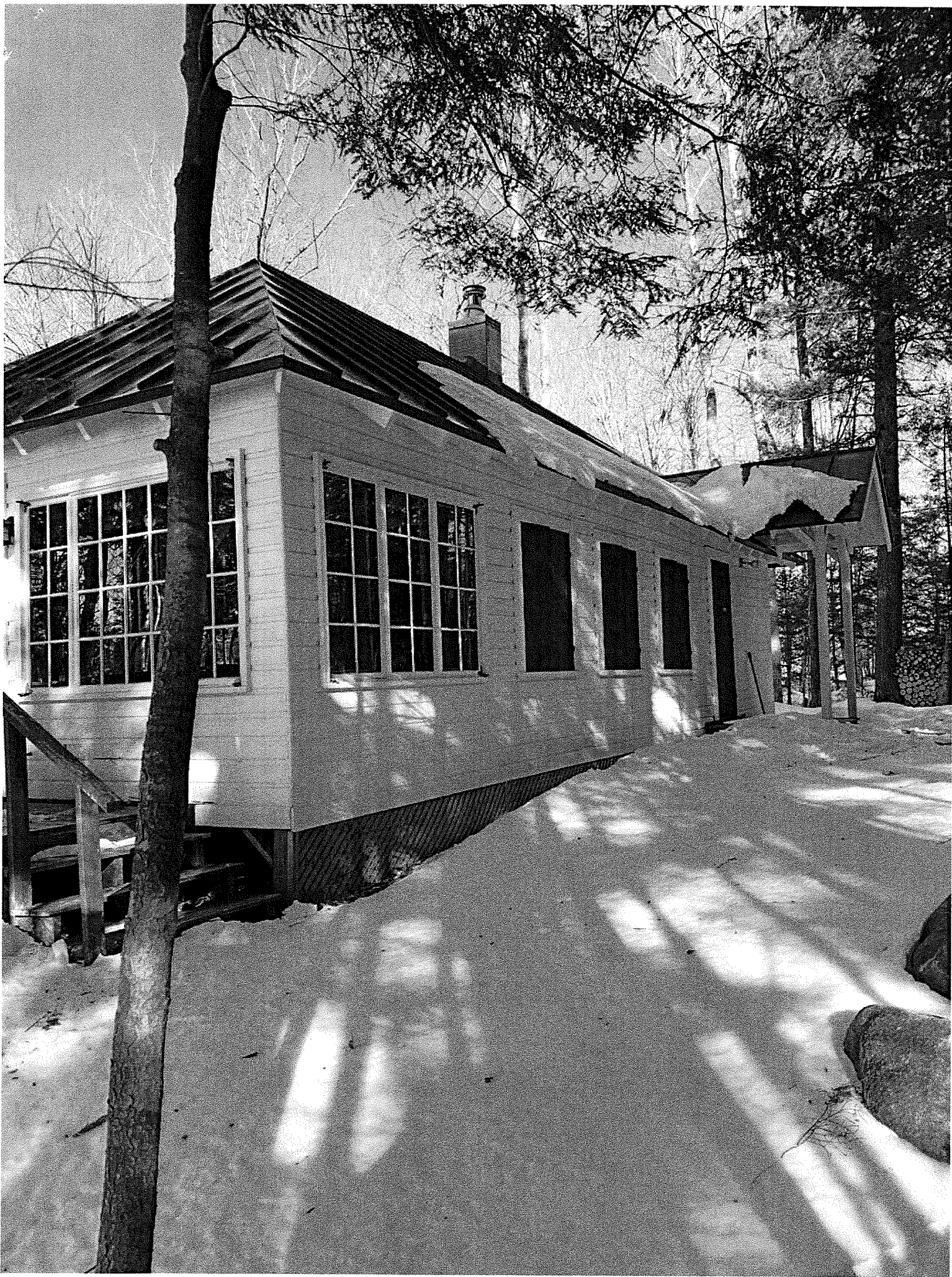
Please accept this summary related to our renovation and addition application for our camp on Great Pond. We own a small, old camp located across from Pine Island that sits on 1.15 acres (200 feet waterfront x 250 feet). The camp itself is in great shape, but it is small. There are technically no bedrooms. The camp itself is 36 x 20 feet (720 square feet), and the front deck is 15 x 8 (120 square feet). Rather than trying to expand up by adding a 2nd level and losing the charm of the old camp, our plan is to build an addition attached to the left side of the camp (looking at it from the water – photos attached to application) that fits the sizing and aesthetic of the original camp. The area where we propose the addition is the current location of the old, but functioning gravel leach field, with an old, steel septic tank behind it. We already obtained a septic permit last fall to install a 1000-gallon concrete septic tank and a new leach field farther back from the water and to the left of the existing leach bed. Kevin Hawes is installing the new system this spring. Because we will be constructing the addition on top of the abandoned leach bed, there is no clearing required and the land is flat.

Hammond worked with us on a plan that was appropriate in scope, while mimicking the existing metal roofing, pitches, and siding of the original camp. We will be adding a small dormer on the existing front in the sleeping loft, and 2 similar dormers on the front of the addition for design continuity, and to break up the roofline. The Hammond plan is attached to the application. The living space in the addition will be 24 x 20 (480 sq. feet) and will include 2 bedrooms, 1 bathroom, a sleeping loft above, and a smaller family room where it connects to the existing living room. There will be a 10-foot deep (240 square feet) screen room on the front/lakeside of the addition accessed by 2 sliding doors. The elevation of the floor will match the existing, and the roof will be the same general height (within 2-3 feet of the low-sling hip roof on the main camp). The main camp foundation will be leveled and pier footers replaced and shored up. The addition will be supported on concrete footers, concrete piers, and pressure-treated posts, which is consistent with the original camp. Finally, all of the old, single pane windows on the camp will be replaced with triple pane, energy efficient windows in the same size as existing.

Gary Fuller met with us on site last summer, and gave us guidance on what size and location are allowed for any additions. This plan is consistent with those discussions and Belgrade's applicable shoreland zoning regulations and codes, with the added benefit that we will be discontinuing the old septic system and replacing it with a more environmentally friendly system.

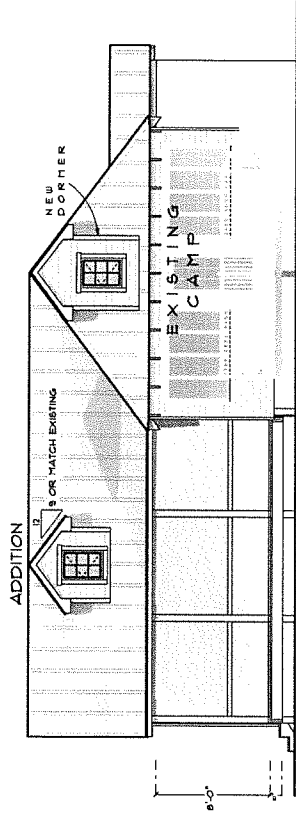
Thanks for your consideration.

John and Lisa Veilleux – 37 Parkhill Point Rd., Belgrade (Great Pond) – 207-632-9886

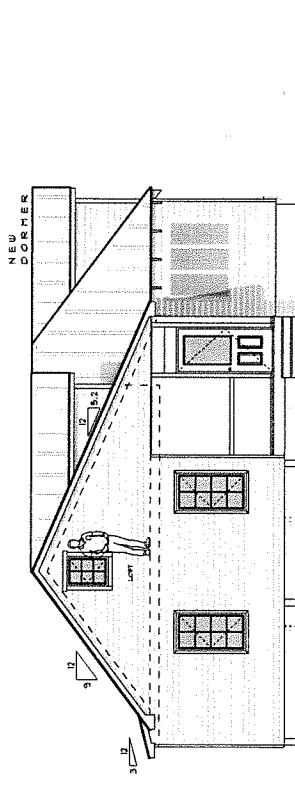




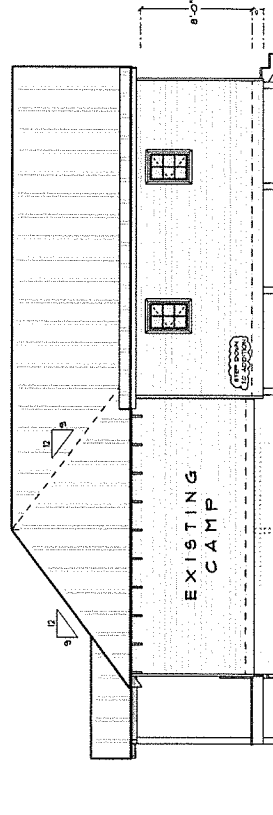
PRELIMINARY DRAWING
NOT FOR CONSTRUCTION



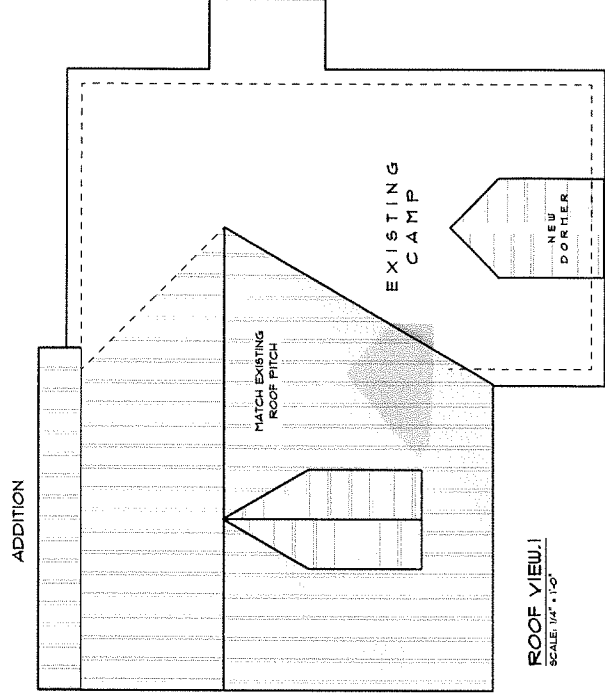
FRONT ELEVATION.2
SCALE: 1/4" = 1'-0"



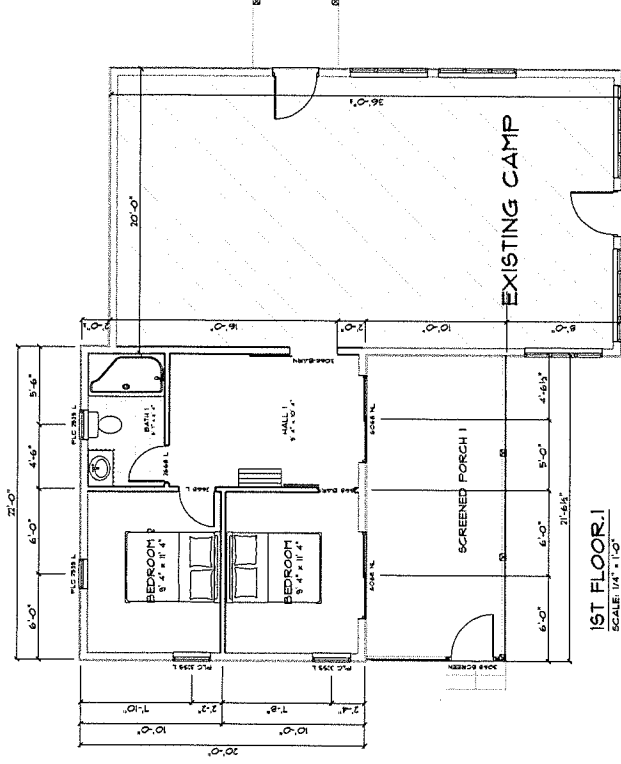
LEFT ELEVATION.1
SCALE: 1/4" = 1'-0"



REAR ELEVATION.2
SCALE: 1/4" = 1'-0"



ROOF VIEW.1
SCALE: 1/4" = 1'-0"



1ST FLOOR.1
SCALE: 1/4" = 1'-0"

HOME
PLANNING CENTER

JOHN VEILLEUX

VEILLEUX CAMP
ADDITION

BELGRADE, ME

SCALE: AS NOTED

DATE: 10/10/2019

DATE: 10/10/2019

DATE: 10/10/2019

AD201915

1 OF 1

21 LOCATIONS ACROSS MAINE
Hammond
Lumber Company
WWW.HAMMONDLUMBER.COM

Receipt # 265-

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept. Health & Human Services
Div of Environmental Health, 11 SHS
(207) 287-2070 Fax: (207) 257-4172

PROPERTY LOCATION		>> CAUTION: LPI APPROVAL REQUIRED <<	
City, Town, or Plantation	Belgrade	Town/City	Belgrade
Street or Road	37 Parkhill Point Road	Permit #	3884
Subdivision, Lot #		Date Permit Issued	9/10/20
OWNER/APPLICANT INFORMATION		Fee: \$	250.00
Name (last, first, MI)	Veilleux, John	Double Fee Charged ()	
Mailing Address of Owner/Applicant	19 Aspilbe Lane Yarmouth, Maine 04096	L.P.I. #	850
Daytime Tel. #	207-632-9886	Municipal Tax Map # 12 Lot # 4	
OWNER OR APPLICANT STATEMENT		CAUTION: INSPECTION REQUIRED	
I state and acknowledge that the information submitted is correct to the best of my knowledge and understand that any falsification is reason for the Department and/or Local Plumbing Inspector to deny a Permit.		I have inspected the installation authorized above and found it to be in compliance with the Subsurface Wastewater Disposal Rules Application.	
Signature of Owner or Applicant: <u>John Veilleux</u> Date: <u>9/15/2020</u>		Local Plumbing Inspector Signature: <u>[Signature]</u> (1st) date approved: <u>9/15/2020</u>	

PERMIT INFORMATION	
TYPE OF APPLICATION	THIS APPLICATION REQUIRES
<input type="checkbox"/> 1. First Time System <input checked="" type="checkbox"/> 2. Replacement System Type replaced: ? (stone) Year installed: ? <input type="checkbox"/> 3. Expanded System a. <25% Expansion b. ≥25% Expansion <input type="checkbox"/> 4. Experimental System <input type="checkbox"/> 5. Seasonal Conversion	<input type="checkbox"/> 1. No Rule Variance <input type="checkbox"/> 2. First Time System Variance a. Local Plumbing Inspector Approval b. State & Local Plumbing Inspector Approval <input checked="" type="checkbox"/> 3. Replacement System Variance a. Local Plumbing Inspector Approval b. State & Local Plumbing Inspector Approval <input type="checkbox"/> 4. Minimum Lot Size Variance <input type="checkbox"/> 5. Seasonal Conversion Permit
SIZE OF PROPERTY	DISPOSAL SYSTEM TO SERVE
1.23 <input type="checkbox"/> SQ. FT. <input checked="" type="checkbox"/> ACRES	<input checked="" type="checkbox"/> 1. Single Family Dwelling Unit, No. of Bedrooms: 3 <input type="checkbox"/> 2. Multiple Family Dwelling, No. of Units: _____ <input type="checkbox"/> 3. Other: _____ (specify)
SHORELAND ZONING	DISPOSAL SYSTEM COMPONENTS
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> 1. Complete Non-engineered System <input type="checkbox"/> 2. Primitive System (graywater & alt. toilet) <input type="checkbox"/> 3. Alternative Toilet, specify: _____ <input type="checkbox"/> 4. Non-engineered Treatment Tank (only) <input type="checkbox"/> 5. Holding Tank, _____ gallons <input type="checkbox"/> 6. Non-engineered Disposal Field (only) <input type="checkbox"/> 7. Separated Laundry System <input type="checkbox"/> 8. Complete Engineered System (2000 gpd or more) <input type="checkbox"/> 9. Engineered Treatment Tank (only) <input type="checkbox"/> 10. Engineered Disposal Field (only) <input type="checkbox"/> 11. Pre-treatment, specify: _____ <input type="checkbox"/> 12. Miscellaneous Components
	TYPE OF WATER SUPPLY
	<input checked="" type="checkbox"/> 1. Drilled Well <input type="checkbox"/> 2. Dug Well <input type="checkbox"/> 3. Private <input type="checkbox"/> 4. Public <input type="checkbox"/> 5. Other

DESIGN DETAILS (SYSTEM LAYOUT SHOWN ON PAGE 3)			
TREATMENT TANK	DISPOSAL FIELD TYPE & SIZE	GARBAGE DISPOSAL UNIT	DESIGN FLOW
<input checked="" type="checkbox"/> 1. Concrete a. Regular b. Low Profile <input type="checkbox"/> 2. Plastic <input type="checkbox"/> 3. Other: _____ CAPACITY: 1000 GAL.	<input checked="" type="checkbox"/> 1. Stone Bed <input type="checkbox"/> 2. Stone Trench <input type="checkbox"/> 3. Proprietary Device a. cluster array <input type="checkbox"/> c. Linear b. regular load <input type="checkbox"/> d. H-20 load <input type="checkbox"/> 4. Other: _____ SIZE: 900 <input type="checkbox"/> sq. ft. <input type="checkbox"/> lin. ft.	<input checked="" type="checkbox"/> 1. No <input type="checkbox"/> 2. Yes <input type="checkbox"/> 3. Maybe If Yes or Maybe, specify one below: <input type="checkbox"/> a. multi-compartment tank <input type="checkbox"/> b. _____ tanks in series <input type="checkbox"/> c. increase in tank capacity <input type="checkbox"/> d. Filter on Tank Outlet	270 _____ gallons per day BASED ON: <input checked="" type="checkbox"/> 1. Table 4A (dwelling unit(s)) <input type="checkbox"/> 2. Table 4C (other facilities) SHOW CALCULATIONS for other facilities
SOIL DATA & DESIGN CLASS	DISPOSAL FIELD SIZING	EFFLUENT/EJECTOR PUMP	LATITUDE AND LONGITUDE
PROFILE CONDITION 3 / C at Observation Hole # TP-1 Depth 22" of Most Limiting Soil Factor	<input type="checkbox"/> 1. Medium---2.6 sq. ft. / gpd <input checked="" type="checkbox"/> 2. Medium---Large 3.3 sq. ft. / gpd <input type="checkbox"/> 3. Large---4.1 sq. ft. / gpd <input type="checkbox"/> 4. Extra Large---5.0 sq. ft. / gpd	<input checked="" type="checkbox"/> Not Required <input type="checkbox"/> May Be Required <input type="checkbox"/> Required Specify only for engineered systems: DOSE: _____ gallons	<input type="checkbox"/> 3. Section 4G (meter readings) ATTACH WATER METER DATA at center of disposal area Lat. " _____ d " _____ m " _____ s Lon. " _____ d " _____ m " _____ s if g.p.s, state margin of error: _____

SITE EVALUATOR STATEMENT		
I certify that on <u>9/10/20</u> (date) I completed a site evaluation on this property and state that the data reported are accurate and that the proposed system is in compliance with the State of Maine Subsurface Wastewater Disposal Rules (10-144A CMR 241).		
Site Evaluator Signature <u>Kenneth Pratt</u>	SE # <u>422</u>	Date <u>9/10/20</u>
Site Evaluator Name Printed	Telephone Number <u>207-576-1413</u>	E-mail Address <u>ceolpi@msn.com</u>

Note : Changes to or deviations from the design should be confirmed with the Site Evaluator.

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Department of Human Services
Division of Health Engineering
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation

Belgrade

Street, Road, Subdivision

37 Parkhill Point Road

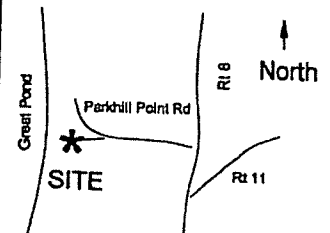
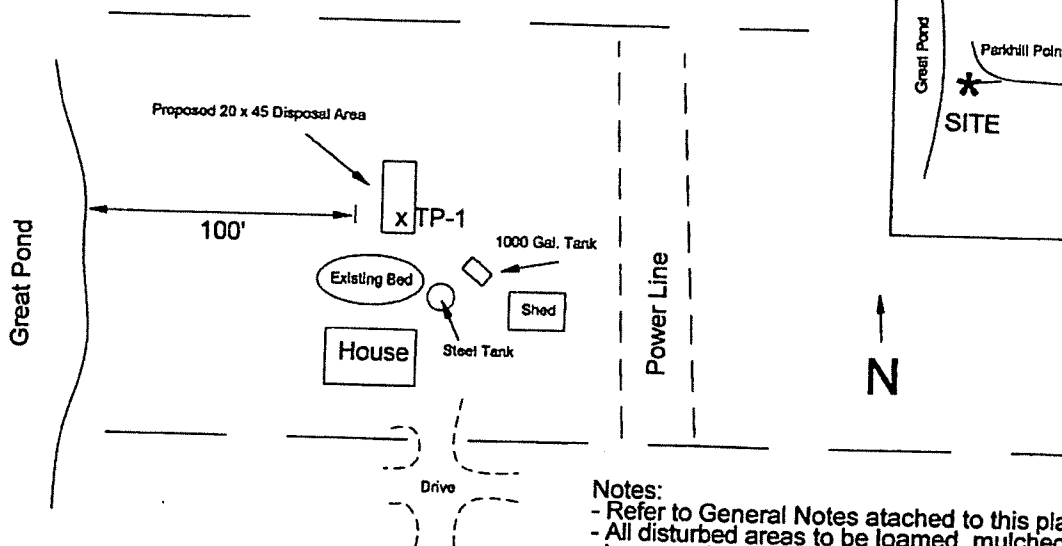
Owner's Name

John Veilleux

SITE PLAN

Scale 1" = 100 ft. or as shown

SITE LOCATION PLAN



Notes:

- Refer to General Notes attached to this plan.
- All disturbed areas to be loamed, mulched and seeded to prevent erosion.
- Surface water must be drained away from system.
- D-Box and Lines shall be insulated to prevent freezing

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP-1 ☐ Test Pit ☒ Boring
0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (Inches)	Texture	Consistency	Color	Mottling
0				
10	Loam	friable	Brown	None
20				Observed
30	Fine Sandy Loam	Firm	Grey brown	
40				
50				

Note: I have been informed that an independent inspection of the septic system was done on this lot, prior to purchase. The report said that the existing system is in good working order with a 1000 Gallon concrete tank. This tank was not found, but the cover of a steel tank was. If a 1000 gallon concrete tank, in good working order is uncovered and inspected. It may be used with the new system, as long as the elevation is addiquit. The existing steel tank should be uncovered, pumped and filled.

Soil Classification	Slope	Limiting Factor	<input type="checkbox"/> Ground Water
7 C	2 %	22	<input checked="" type="checkbox"/> Restrictive Layer
Profile Condition			<input type="checkbox"/> Bedrock
			<input type="checkbox"/> Pit Depth

Site Evaluator Signature

422

SE #

9/10/20

Date

Page 2 of 3
HHE-200 Rev. 8/01

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION		Department of Human Services Division of Health Engineering (207) 287-5672 Fax: (207) 287-3165
Town, City, Plantation Belgrade	Street, Road, Subdivision 37 Parkhill Point Road	Owner's Name John Veilleux
SUBSURFACE WASTEWATER DISPOSAL PLAN		

(207) 287-5672 Fax: (207) 287-3165

Owner's Name
John Veilleux

SUBSURFACE WASTEWATER DISPOSAL PLAN		John Veilleux
-------------------------------------	--	---------------

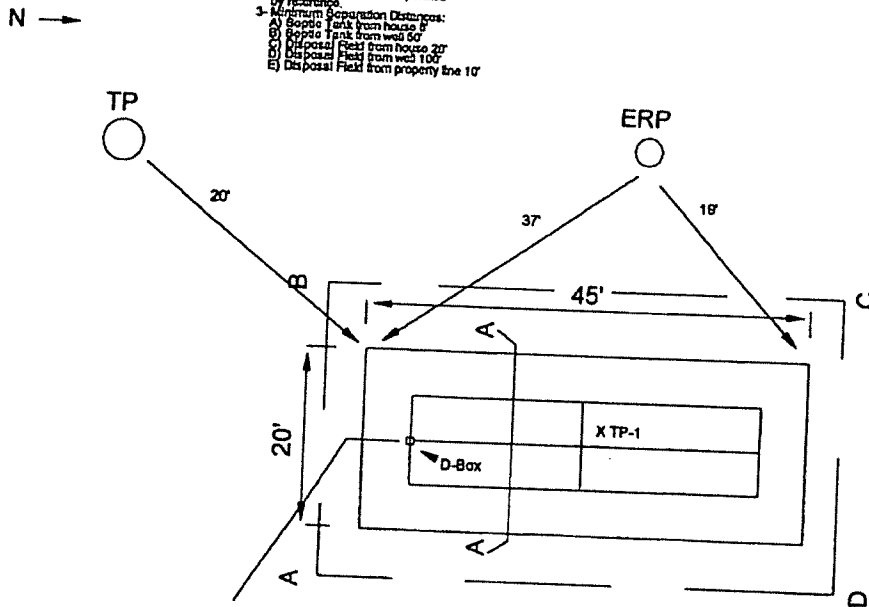
SCALE: 1" = 20 FT.

Notes:

- 1- Refer to General Notes attached to HHE-200.
- 2- The State of Maine Subsurface Wastewater and Disposal Rules are incorporated by reference.
- 3- Minimum Separation Distances:
 - A) Septic Tank from house 5'
 - B) Septic Tank from well 50'
 - C) Disposal Field from house 20'
 - D) Disposal Field from well 100'
 - E) Disposal Field from property line 10'

Original Elevations

A= -27°
B= -33°
C= -42°
D= -30°



FILL REQUIREMENTS	CONSTRUCTION ELEVATIONS	ELEVATIONS
-------------------	-------------------------	------------

Depth of Fill (Upslope) 24"

Finished Grade Elevation

CONSTRUCTION ELEVATIONS

-18"

ELEVATION REFERENCE POINT

Location & Description: Flagged Nail
12" Ash 42" AG

Reference Elevation: 0"

Depth of Fill (Downslope) 24"

Bottom of Disposal Area

-30
-42"

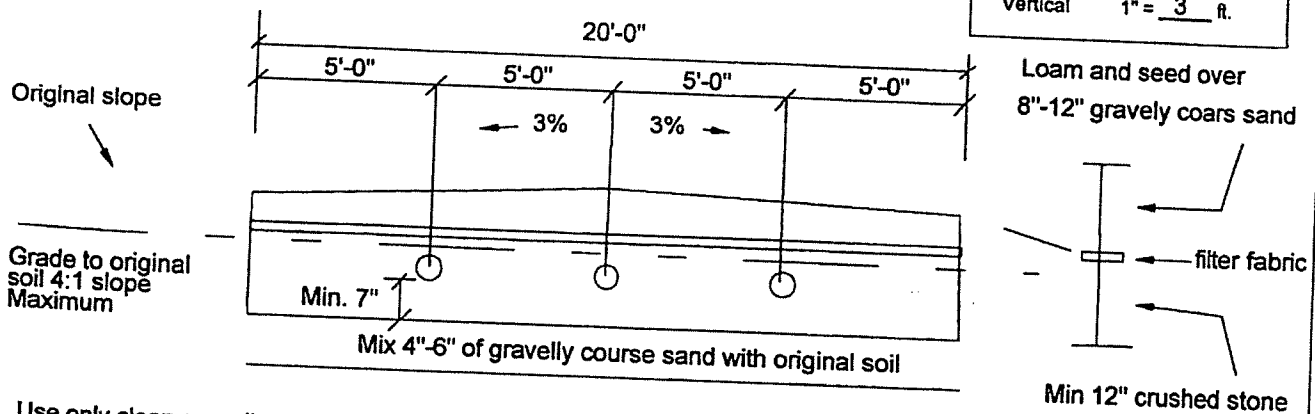
DISPOSAL AREA CROSS SECTION

CROSS SECTION A-A

Scale

Horizontal 1" = 5 ft.

Vertical $1" = \underline{3} \text{ ft.}$



Use only clean gravelly coarse sand Backfill material.
Remove all organic materials, rocks and foreign materials from disposal area

Site Evaluator Signature

422

SE #

9/10/20

Date _____

TOWN OF BELGRADE

SUBDIVISION APPLICATION

Subdivision Name Cedar Mill Ridge

APPLICANT INFORMATION

1. Name of Property Owner: Evans Development LLC

Address: PO Box 586

Belgrade Lakes, ME

Zip: 04918

2. Name of Applicant: Tyler Evans

Address: PO Box 586

Belgrade Lakes, ME

Zip: 04918

Telephone: 207-485-1800

3. If applicant is a corporation, check if licensed in Maine:
____ Yes ____ No Attach a copy of State's Registration.

4. Name of applicant's authorized agent:

N/A

Address: _____

Zip: _____

Telephone: _____

5. Name of Land Surveyor, Engineer, Architect or others preparing plan:

K+K Land Surveyors, Inc.

Address: PO Box 596

Oakland, ME

Zip: 04963

Telephone: (207) 465 - 7077

Registration #: 1132

6. Person and Address to which all correspondence regarding this application should be sent:

Tyler Evans

Address: PO Box 586

Belgrade Lakes, ME

Zip: 04918

SUBDIVISION APPLICATION

7. What legal interest does the applicant have in the property to be developed (ownership, option, purchase & sales contract, etc.)? Ownership

8. What interest does the applicant have in any abutting property? Ownership

LAND INFORMATION

9. Location of Property

from County Registry of Deeds: Book 13127 Page 222

from Tax Maps: Map 6 Lot(s) 16B

10. Is any portion of the property within 250 feet of the high water mark of a pond, river or stream? Yes X No

11. Acreage to be developed: ± 20 Acres

12. Indicate the nature of any restrictive covenants to be placed in the deeds: minimum S.F., no mobile homes,
no livestock, no further subdivision.

13. Has this land been part of a prior approved subdivision?
Yes X No

Or other division within the past 5 years? X Yes No

14. Identify existing use(s) of land (farmland, woodlot, etc.):
woodlot

15. Does the parcel include any waterbodies? X Yes No

16. Is any portion of the property within a special flood hazard area as identified by the Federal Management Agency?
Yes X No

17. List below the names and mailing addresses of abutting property owners and owners across the road:

<u>Name</u>	<u>Address</u>
<u>Mark + Luanne Hovey</u>	<u>45 Hardwood Circle, Belgrade</u>
<u>Chris + Linda Ryan</u>	<u>41 Hardwood Circle, Belgrade</u>

SUBDIVISION APPLICATION

<u>Name</u>	<u>Address</u>
Jason + Catherine Carey	17 Hardwood Circle, Belgrade
Brent Chisholm + Erin Merrill	27 Hardwood Circle, Belgrade
Cole McElwain	90 Dunn Rd. Belgrade
Christa Roddy + Eric Goodale	100 Dunn Rd. Belgrade
Rockshore LLC	PO Box 586 Belgrade Lakes
Tyler + Rees Evans	70 Dunn Rd. Belgrade

GENERAL INFORMATION

18. Number of lots or units: ±10 Lots
19. Anticipated date for construction: Spring 2021
20. Anticipated date of completion: 2026
21. Identify method of water supply to the proposed development:
☒ individual wells
☐ central well with distribution lines
☐ other - please state alternative: _____
22. Identify method of sewage disposal to the proposed development:
☒ individual septic tanks
☐ central onsite disposal with distribution lines
☐ other - please state alternative: _____
23. Identify method of fire protection for the proposed development:
☐ dry hydrants located on an existing pond or water body
☐ existing fire pond
☒ other - please state alternative: TBD
24. Does the applicant propose to dedicate to the public any roads, recreation or common lands?
If any: road(s) ☐ Yes ☒ No
Estimated length: _____
recreation area(s) ☐ Yes ☒ No
Estimated Acreage _____
common land(s) ☐ Yes ☒ No
Estimated Acreage _____

SUBDIVISION APPLICATION

25. Does the applicant intend to request waivers of any of the subdivision submission requirements? - Yes X No If yes, list them and state reasons for the request:

26. Submission: The Preapplication Sketch Plan shall show, in simple sketch form, the proposed layout of streets, lots, and other features in relation to existing conditions. The Sketch Plan, which may be a free-hand pencilled sketch, should be supplemented with general information to describe or outline the existing conditions of the site and the proposed development. It is recommended that the Sketch Plan be superimposed on or accompanied by a copy of the Assessor's Map(s) on which the land is located. The Sketch Plan shall be accompanied by a copy of a portion of the U.S.O.S. Topographic Map of the area showing the outline of the proposed Subdivision, unless the proposed Subdivision is less than ten acres in size.

TO THE BEST OF MY KNOWLEDGE, all the above-stated information submitted in this application is true and correct.

9/10/2020
Date

[Signature]
Signature of Applicant

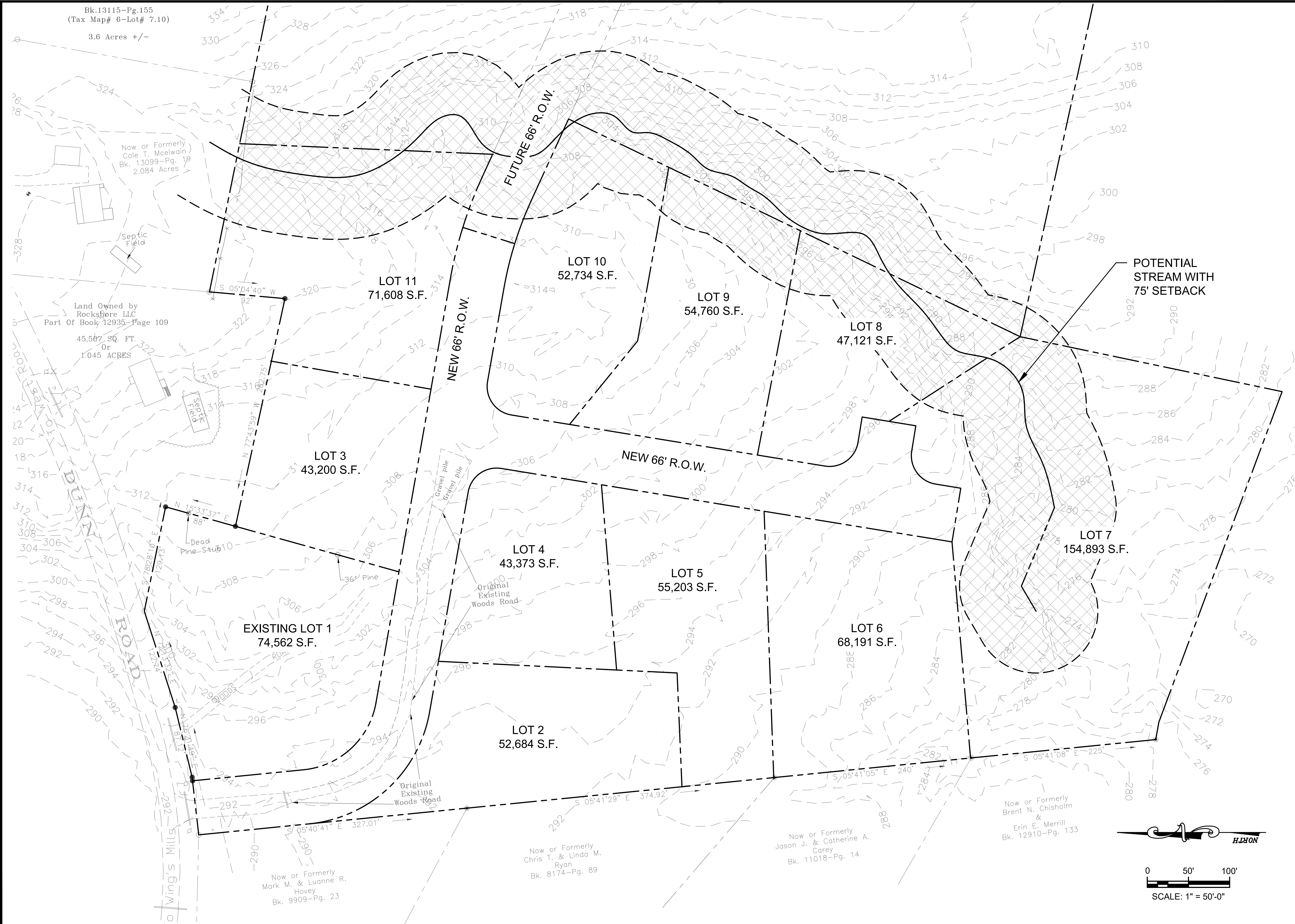
ROCKSHORE@OUTLOOK.COM 267-485-1800

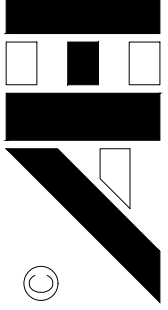
NOTES:

- 1) BEARINGS ARE REFERENCED TO NAD 83 STATE PLANE, WEST ZONE (NAD 83).
- 2) Easements based on 1925 Adams, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551

[illegible]







AEHodsdon
CONSULTING ENGINEERS

10 Common Street Waterville, Maine 04901
(207) 873-5164
(207) 872-0645

REV.	DATE	STATUS
1	JLA 00-00-2021	XXX

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM A.E. HODSDON CONSULTING ENGINEERS. ANY ALTERATIONS AUTHORIZED OR OTHERWISE SHALL BE AT THE USER'S SALES RISK AND WITHOUT LIABILITY TO A.E. HODSDON CONSULTING ENGINEERS.

PRELIMINARY WITHOUT ORIGINAL SIGNATURE AND SEAL

PRELIMINARY
NOT FOR
CONSTRUCTION

SUBDIVISION LAYOUT PLAN
OF:
SUBDIVISION PLAN - PHASE I
DUNN ROAD
BELGRADE, MAINE
FOR:
TYLER EVANS
P.O. BOX 586
BELGRADE, MAINE

DRAWN	CHECKED
PLS	JLA
SCALE	DATE
AS NOTED	05-19-2021

C0.1

PROJECT#: 125-21

Planning Board Meeting Minutes

May 20, 2021

**will be sent as a separate document