STATE OF CONNECTICUT SITING COUNCIL

PETITION OF LSE PICTOR LLC FOR A DECLARATORY RULING THAT NO CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED IS REQUIRED FOR THE CONSTRUCTION, OPERATION, AND MAINTENANCE OF A 1.99 MW AC SOLAR PHOTOVOLTAIC FACILITY IN WINCHESTER, CONNECTICUT

PETITION NO. 1398

May 12, 2020

PETITIONER LSE PICTOR LLC'S RESPONSES TO SITING COUNCIL INTERROGATORIES DATED APRIL 21, 2020

Project Development

1. ***Referring to the Petition p. 7, identify all permits necessary for construction and operation and what entity will hold the permit(s)?***

Petitioner will require a stormwater permit from the Department of Energy and Environmental Protection ("DEEP"), the application for which will be submitted to DEEP upon approval of this petition. Petitioner will file for and hold such stormwater permit upon issuance. In addition, Petitioner will require a building permit and electrical permit from the Town of Winchester. Additionally, Petitioner has submitted an Interconnection Application to the electric distribution company, Connecticut Light & Power, dba Eversource ("Eversource"), who has performed an interconnection analysis and system impact study, and issued an Interconnection Services Agreement pursuant to the authority granted to them via the Public Utility Regulatory Administration ("PURA").

2. ***Referring to Petition p. 3, what is the length of the LREC/ZREC agreement with Eversource? Is there an option within the LREC/ZREC agreement to allow for changes in the total output of the facility based on unforeseen circumstances or resulting from a reduced site footprint?***

The LREC agreement with Eversource is for a period of fifteen (15) years. In the LREC/ZREC agreement, there is a maximum annual quantity established and Eversource agrees to purchase up to that amount each year. If there is a change in the size of the Project before the system is operational, the maximum annual quantity is adjusted per the terms of agreement.

3. ***Referencing Petition p. 3, how is the Virtual Net Metering (VNM) split between the Towns of Winchester and Windsor? Please explain how the sale of LREC/ZREC credits is related to VNM.***

Petitioner has an executed letter of intent with the Town of Windsor and the Petitioner and the Town are working towards a definitive agreement. The Town of Winchester is currently reviewing a draft letter of Intent. The COVID-19 pandemic and associated restrictions has delayed the timing of these

reviews. The allocation of the virtual net metering credits between the two municipalities will be finalized when the virtual net metering agreements are finalized. There is no relationship between the LREC/ZREC program and VNM--they are two separate programs both applicable to renewable energy projects in the State of Connecticut.

4. ***What percent of the energy produced is under VNM contract? In other words, what percentage of the annual electrical energy generated by the project would be attributed to each municipality? If there is any electrical energy produced that is not subject to the VNM program, where will it be sold?***

Petitioner is planning to allocate 100% of the net metering credits generated by the Project between the towns of Windsor and Winchester. The allocation between these two municipalities has not been finalized since, as noted in response to #3 above, the VNM agreements with the municipalities have not been finalized.

5. ***If the LREC/ZREC agreement and VNM agreement are not renewed at the end of the contracts and the solar facility has not reached the end of its lifespan, will the Petitioner decommission the facility or seek other revenue mechanisms for the electricity produced by the facility?***

Petitioner's LREC/ZREC agreement is for a period of fifteen (15) years. If that agreement is not renewed at the end of the fifteen (15) year period, Petitioner would look at opportunities to sell the environmental attributes at that time. The virtual net metering agreement, on the other hand, is for a time period of twenty (20) years. At the end of the term of the agreement, the VNM program will continue, and the current offtakers may renew, or Petitioner may seek to contract with another municipality for the remaining useful life of the Facility.

Proposed Site

6. ***The petition states Trade Wind Farms, LLC is the Property Owner. Petition Attachment 9 states the property will be sold to Reservoir Holdings, LLC. When will the sale occur? Who will be the property owner at the time Lodestar's lease will be executed?***

Petitioner would like to correct attachment 9. The Property is currently owned by Trade Wind Farms, LLC and Mayland Energy, LLC (not Reservoir Holdings, LLc) has an irrevocable option to purchase the Property, which will occur upon approval of this petition. Mayland Energy, LLC as the owner of the Property, and Petitioner will enter into a lease for the portion of the Property occupied by the Facility. Mayland Energy, LLC's purchase of the Property and lease to Petitioner is anticipated to occur in July of 2020.

7. ***Are there any provisions in the lease agreement with the property owner related to site restoration at the end of the project's useful life? If so, please provide any such provisions.***

The lease between Petitioner and Mayland Energy, LLC contains decommissioning and site restoration obligations. The Lease requires that all equipment will be removed from the Property upon the expiration or termination of the lease and/or cessation of the operation of the Project.

8. ***Provide the distance, direction and address of the nearest off-site residence and nearest property line from the solar field perimeter fence. (different values are listed in the petition narrative and noise report).***

The nearest off-Property residence is the Kolek property to the northwest. It is eight hundred and seventy-five feet (875') from the northwest corner of Project to the residence on the Kolek property. It is one hundred forty feet (140') from the northwest corner of Project to the property boundary of the Kolek property. The reason for the difference in the values from the petition narrative and noise report is due to the fact that the noise report is measuring the distance from the closest piece of equipment to the nearest property boundary, not the fence line.

9. ***What is the distance from the Gillette and the Kolek properties to the 1) proposed limit of tree clearing, and 2) the proposed fence line? What visual impacts are anticipated from these two properties?***

The distance from the southeast corner of the Kolek property to the clearing limits varies between one hundred thirty feet (130') to one hundred sixty feet (160'). The distance from the southeast corner of the Kolek property to the actual solar array varies between one hundred fifty feet (150') to one hundred seventy feet (170'). The distance from the southeast corner of the Gillette property to the clearing limits varies between one hundred seventy-eight feet (178') to three hundred twenty-eight feet (328'). The distance from the southeast corner of the Gillette property to the actual solar array varies between two hundred twenty-eight feet (228') and three hundred thirty-six feet (336'). Due to the significant (over one hundred feet (130'-336') of mature forested coverage between those properties and the Project, Petitioner anticipates no visual impact to either property.

10. ***Petition p. 4 states the proposed installation will utilize existing access and infrastructure. Provide information as to what existing access/infrastructure will be incorporated into the proposed projec***t.

Petitioner was referring to the existing infrastructure on Platt Hill Road including the existing Eversource distribution system located thereon.

11. ***Referencing Petition Attachment 9, please provide the following:***

a) Indicate the ground slopes within the solar array area;

The natural slope in the area of the proposed solar array is variable, so Petitioner has provided representative slope measurements. Slope along ridge line (north to south) = 5.6%, Slope from ridge line to east along Row #1 = 8.1%, Slope from ridge line to west along Row #6 = 9.9%, Slope from ridge line to west along Row #12 = 8.5%, Slope from ridge line to east along Row #17 = 7.1%, Slope from ridge line to west along Row #17 = 9.5%, Slope from ridge line to east along Row #23 = 7.4%, Slope from ridge line to west along Row #23 = 7.9%

b) Figures 1, 4 & 5 are not legible - provide legible copies;
c) Provide a solar facility overlay using the Figure 1 color topographic map;
d) Figure 2 depicts a subdivision plot map. Revise Figure 2 to show the proposed solar facility;
e) Figure 3 is dated 1978 –is this the most recent FEMA mapping for this area? If not, submit the most recent version; and
f) Estimate the acreage of prime farmland soils affected by the project development area and laydown area;

Please see Exhibit A (Revised Site Plans) attached here to showing updating information for (a)-(d). In addition, the 1978 FEMA map is the most recent FEMA map available for this the Project location. None of the prime farmland soils on the Property will be impacted by the Project, including the laydown area.

Energy Output

12. ***Have electrical loss assumptions been factored into the output of the facility? If so, identify what losses would potentially occur. What is the output (MW AC) at the point of interconnection at year one?***

Yes, electrical losses have been accounted for in the system modeling. Transformers generally incur a 1% efficiency loss and medium voltage line losses will be limited to 2% loss at full output. In effect, the maximum output at the point of interconnection is 1.931 MW including the modeled losses. The 1.99 MW AC output rating of the Project is the "name-plate" which is the definition required in our Interconnection Application to the electric distribution company.

13. ***Would the power output of the solar panels decline over time? If so, estimate the percent loss per year.***

Yes, solar panels do incur degradation over time. The expected degradation rate is 0.3% to 0.4% per year. The solar panel warranty guarantees power generation of 85% of the original production in year twenty-five (25) of operation.

14. ***Referring to petition p. 9, what is the projected annual capacity factor for the proposed Project?***

The projected capacity factor for the proposed Project is 19.1%.

15. ***Does the design of the Project, including the method of interconnection, allow it to serve as a microgrid?***

There is no current plan for this Project to service as a microgrid. Petitioner's interconnection agreement with Eversource is not designed for islanding the power.

16. ***Is Lodestar designing the Project to accommodate a potential battery storage system?***

There is no current plan for battery installation because such technology is not currently provided for under the existing regulatory regime. In the event that the regulatory environment changes, Petitioner may later seek to install batteries at the Project and, if so, would seek the required regulatory approvals to do so, including any approvals required by the Siting Council.

17. ***Do the string inverters service one section of the solar array so that if one section experiences an electrical problem that causes the section to shut down, could the other sections of the solar array still operate and transmit power to the grid?***

In the event there is an issue with an inverter located on a portion of the array, the inverter dedicated to this portion will issue a fault and safely restrict power flow within that portion of the array. The remainder of the inverters will remain operational during this period.

Site Components and Solar Equipment

18. ***Petition p. 6 mentions a ballasted fence. Please define the term "ballasted".***

This reference is incorrect and Petitioner would like to correct such reference. The fence will be supported by driven post construction.

19. ***Petition pp. 6 & 7 both refer to images but no images were provided. Please submit.***

Please see below.

Typical module type, racking system

Sample project:

20. ***Is the wiring from the panels to the inverters installed on the racking? If wiring is external, how would it be protected from potential damage from weather exposure, vegetation maintenance, or animals?***

Yes, DC wiring is to be installed on the racking directly below the modules. The racking system is designed to incorporate the wiring close to the modules with no loose conductors. According to the National Electric Code, this circuitry must be comprised of a special conductor called USE-2 also known as "photovoltaic wire." USE-2 is specifically designed for this Project. Although the circuitry is mounted below the modules and not exposed to direct sunlight, USE-2 consists of a unique insulation that is resistant to UV exposure for extended periods. In addition, USE-2 wire consists of a thicker insulation jacket that shields the circuit from animal intrusion, chafing, etc. As a fail-safe for unanticipated events, each circuit is fuse-protected, which protects the circuit from thermal concerns and short circuits.

21. ***The solar panels are identified as 340 to 380 watts. Is it feasible to use a higher power output rated panel to reduce the project footprint?***

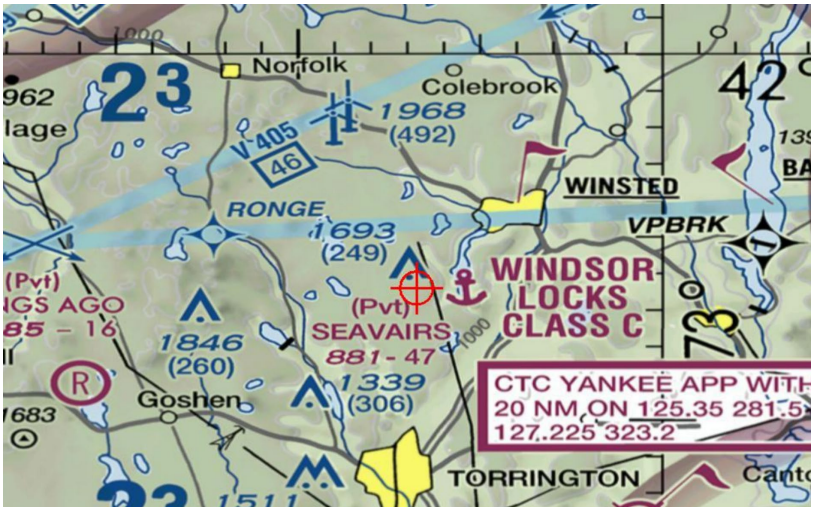
Larger wattage panels do result in a reduced footprint and construction cost. The output and efficiency of the modules is constantly improving. At this time, 390W modules represent the pinnacle of commercially available module efficiency and thus the smallest footprint attainable for the Project. Petitioner will continue to review the availability of panels prior to construction and will finalize the design based on the size (wattage) accordingly. Any increase in the proposed name-plate wattage or

design of the overall Facility would be submitted to the Council for any approvals that may be required for such changes.

Public Safety

22. ***Referring to the FAA Analysis at Petition Tab 12, what is the distance/direction to the nearest airport from the site? Is a glare analysis required under FAA rules?***

The nearest airport is a private seaport (SEAVAIRS) located within Highland Lake located 1.25 miles East of the proposed site. The airport has no jurisdictional airspace. The FAA has performed their analysis and determined the structure does not pose any hazard to air navigation with respect to the proximity of this airport and surrounding. The FAA did not require a glare analysis due to the Determination of No Hazard received as a result of the FAA aeronautical study. In addition, PV panels are constructed of dark, light absorbing materials and are covered in an anti-reflective coating designed to maximize absorption and minimize reflection.



23. ***Referring to Petition p.15, a health and safety plan is mentioned. Does it include an emergency response plan? Is training planned for local emergency responders in the event of a fire or other emergency at the site? How would site access be ensured for emergency responders?***

Emergency response plan is outlined in the Operations and Maintenance Plan (Exhibit 4 to the Petition). After construction completion and prior to energization, local emergency responders are provided training with our O&M team to ensure emergency response personnel are educated upon the location of specific components of the emergency response plan. The fire department is provided 24/7 access by installing their own lock on the access gate to the site.

24. ***Are there any drinking water wells in the vicinity of the site? If so, how will Lodestar ensure there are no impacts to these wells resulting from construction activities?***

Yes, the single-family residences in the vicinity of the site all have individual wells as public water is not located on Platt Hill Road or Taylor Brook Road. Individual wells for potable water use are

driven into bedrock as required by the Connecticut Public Health Code. Based upon the location of the existing single-family residences adjacent to the subject property, the closest well to the solar array is more than eight hundred feet (800') away. As no blasting will be necessary for the Project, there will be no impact on any of the residential wells. Additionally, the discharge from the stormwater basin into the intermittent stream flows away from any possible wells.

Facility Construction

25. ***What is the anticipated construction time from start to finish (different time periods on Petition p. 7 & p. 17)? What are the approvals necessary as listed in the chart on p. 7?***

The chart on page 7 of the Petition is the anticipated construction schedule and is a reflection of the typical process for solar projects of this size. The "approvals and commissioning" section within the chart on page 7 encompasses the following:

1) Eversource energization approval and testing
2) Electrical inspection and electrical permit closing
3) Stormwater inspection and permit closing
4) Site inspection and building permit closing

26. ***For the proposed electrical equipment concrete pad, would the concrete be pre-cast or poured on site? What other concrete components are proposed at the site? Where and by what method would cement trucks be cleaned at the site?***

Concrete for the single electrical pad proposed will be poured on-site. It will require **one** concrete truck. The truck will be cleaned at the western end of the access driveway off of Platt Hill Road. A concrete washout area has been added to the revised plans attached hereto as Exhibit A.

27. ***What is the length of the racking posts and to what ground depth do the posts need to be installed? How will the posts be installed if shallow bedrock is encountered?***

The embedment depth of the racking posts is site specific and soil specific. This depth will be determined during final structural engineering for the proposed project. Typical embedment depths are 5-7 feet. Based on soil testing completed thus far, no bedrock was encountered at depths of seven (7) feet or more. While encountering bedrock is not anticipated, refusals when installing posts can occur. Based on the specifics of the refusal, there are several methods to accommodate. This includes:

A) testing the uplift and lateral capacity of the post at the depth bedrock is encountered and potentially leaving as is;
B) moving the post to a nearby location and reconfiguring using pre-engineered splice;
C) encasing the post in a concrete foundation.

28. ***List the types of construction equipment that would be used at the sit***e.

Petitioner proposes to use typical construction equipment including but not limited to GRT post driving

machine (tracked), mini excavator (tracked), skid steer (tracked), bulldozer (tracked) and timber harvesters (tracked) are types of construction equipment that will be used for construction of the Project. In addition, commercial trucks will be required to deliver materials to the Project Site.

29. ***Do the two wetland crossings for the site access road require permits from the U.S. Army Corps of Engineers and/or DEEP?***

U.S. Army Corps of Engineers regulate stream/wetlands crossings only if the total square footage impacted is five thousand (5,000) square feet or more. The total proposed area of disturbance here is only one thousand six hundred seventeen (1,617) square feet and therefore no Army Corps permit is required. The wetlands crossings do not require DEEP approval. As noted in the Petition and while not required in connection with this Project, the proposed two wetlands crossings were previously approved by the Town of Winchester's inland wetlands commission in connection with the previous subdivision approval.

30. ***For clarity, revise the Phasing Site Plans 9, 10, &11 sheets to match the descriptions of each phase. Clearly show erosion controls per phase, site clearing limits, acreage of tree clearing, acreage of grubbing, stockpiles, and various seeding areas***.

Please see revised plans attached hereto as Exhibit A. Sheets 9, 10 and 11 are meant to show the limits of each phase of construction and provide an overview of the work being done in each phase. The construction sequence governs the work to be done in each phase. Sheets 3, 4, and 5 are the detailed plans which will be used by the contractor to perform the actual construction and all of the erosion control measures are clearing visible on sheets 3, 4, and 5 as they have a scale of 1" = 40', versus the scale of 1" = 80' for sheets 9, 10, and 11. Site clearing limits are shown on Sheet 9 already. For Phase I, no erosion controls are required by the CT DEP 2002 Guidelines as no soil disturbance will occur during this phase, only the cutting and removal of trees will occur. The phasing line on the plan has been moved so the erosion controls are visible on sheet 9, 10, and 11. Acreage of tree clearing has already been provided on sheet 9 and is 13.6 acres. A stockpile is already shown on the plan for material excavation for the construction of the driveway. Stockpiles are not required in the area of the solar array as we are not removing soil for the area of the solar array. Excavation material for the construction wetland will be used to construct the berm of the constructed wetland.

31. ***Site Plan Sheet 9, Phase I, provide plan detail of the temporary wetland crossings***.

Please see revised plans attached hereto as Exhibit A, which show the proposed temporary wetland crossing utilizing logs which are placed parallel to the stream will be used to provide access for the timber clearing.

32. Site Plan Sheet 10, Phase II clarify the following:
a) Will dewatering procedures be necessary to construct the wetland detention basin? Provide detail.
b) What material will be used to fill holes/depressions resulting from stump removal?

c) How will seeding occur in areas where stumps are to remain (outside solar array)? Will brush, small branches from tree removal, deadfall, and forest duff be removed or left in place? If left in place, how would seed growth be promoted?
d) What is the time interval between Phase II and IIIA? What time interval is necessary to establish stable ground cover and functional swale cover?

Please see revised plans attached hereto as Exhibit A. Petitioner does not anticipate that dewatering will be needed to construct the wetlands basis but, in the event it is needed, the detail has been included in Exhibit A. Native soil will be used to fill in any holes remaining following stump removal. Phase IIIA would commence two (2) weeks after the completion of Phase II as additional erosion control measures consisting of Filtrexx Soxx and Wood Chip Berms will be utilized to maintain non-erosive velocities of any runoff.

33. ***Site Plan Sheets 9 & 10 show limited clearing in the area of the large swale and associated wetland detention basin. How will tree cutting equipment and construction vehicles access this area using the limited cleared area shown? Provide revised plans that clearly show how access will be facilitated***.

Please see revised plans attached hereto as Exhibit A. The clearing limited has been slightly expanded to forty feet (40') to accommodate excavation equipment.

3***4. Site Plan Sheet 11, Phase III, provide the following:***
a) The proposed filter sox in the solar array area do not follow the contours of the hillside. Please revise to comply with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control (2002 Guidelines).
b) Wood chip berms are described but not shown on the site plan. Identify locations.
c) What is the acreage of Phase IIIA and IIIB?
d) For final seeding of the solar array, who will determine if the soil in the area is suitable for the selected seed mix? What methodology will be used? What uniform depth of nutrient rich topsoil is necessary to promote seedling growth?

With respect to Interrogatories 34 (a)-(c), please see revised plans attached hereto as Exhibit A. Alignment of the Filtrexx Soxx has been revised to follow contours. The locations of wood chip berms have been added to Exhibit A. The acreage of Phase IIIA is 4.3 acres and Phase IIIB is 4.2 acres respectively.

With respect to Interrogatory 34 (d), Petitioner proposes to seed the area with a combination of a New England wildflower seed mix and a dixie reseeding crimson clover, as recommended by Trinkhaus Engineering. The rye, fescue and crimson clover are shade tolerant; whereas the wildflower mix and clover both provide flowers for pollinators. Trinkhaus Engineering has performed a visual inspection of the site and determined that the Property will support the proposed seed mix. The Property is a wooded site which has been selectively cleared over the past decade. The deciduous foliage has contributed to high organic concentrations of two to four inches of depth in the shallowest areas. Therefore, broadcast seeding is proposed.

35. ***The site phasing plan does not include any specification for temporary sediment traps or other temporary sediment control measures beyond filter sox arranged across the contours of the hill. Please describe/provide detail of temporary features/measures that will be used to control sediment during construction***.

Sedimentation will be controlled during the construction period by limiting the area of disturbance to less than five (5) acres at one time (per CT DEP 2002 Soil Erosion and Sediment Control Guidelines). Use of Filtrexx Soxx and wood chip berms will ensure that runoff does not achieve a velocity where erosion would occur.

36. ***The proposed construction schedule has a majority of work occurring during winter months. Provide detailed winter work procedures for each phase that address construction erosion and sediment control as well as stabilization of stormwater control swales and the wetland detention basin. If applied in winter, how will seeding be maintained until the spring growing season?***

Petitioner would propose to clear and stabilize the Site prior to the winter months. In the event that Petitioner constructs during the winter months, additional erosion control measures will be implemented to ensure Site stabilization.

37. ***What effect would runoff from the drip edge of each row of solar panels have on site drainage patterns? Would channelization below the drip edge be expected? If not, why not?***

No., channelization is not expected for the following reasons:

1) Except for the removal of stumps, there will be no removal of topsoil within the area of the solar array;

2) The soil surface will be lightly scarified by an excavator prior to the seeding to loosen any compacted soil which may have occurred during the use of equipment to install the racking system and the solar panels themselves;

3) The specified seed mixture for the area of the array was chosen as it will quickly germinate in both sun and shade;

4) The Filtrexx Soxx and Wood Chip Berms will remain in place under the vegetation cover has become established and will not be removed as the material in them will decompose into soil; and

5) 0.75" gaps exist between each module and allow for water intrusion throughout the array. The drip edge of the panel is not restricted to the leading edge of each row and is rather distributed to the drip edge of each module.

38. ***Site plan 13- Notes, Please address the following:***
a) Section TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES - MAINTENANCE REQUIREMENTS - #2 – Why is Filtrexx Soxx being inspected on a monthly basis rather than on a more frequent basis, as outlined in other Sections?

b) Section GENERAL EROSION AND SEDIMENTATION CONTROL PLAN NOTES – -- #7 where will accumulated sediment be disposed of? --#8, #9, & #10 - please clarify the information provided.

Please see revised plans attached hereto as Exhibit A. Filtrexx Soxx are a much more effective sedimentation barrier than a siltation fence so they only need to be inspected on a monthly basis. As Petitioner is not proposing to remove the topsoil or otherwise disturbing the soil in the area of the array, there will likely be little to no accumulation of sediment behind a control barrier. If any sediment does accumulate it will be removed and hand spread in an upland area outside the limit of the array area. The notes referenced are in conformance with CT DEEP 2002 Soil Erosion and Sediment Control Guidelines.

39. ***Petition p. 11 states Lodestar consulted with CT DEEP. What divisions of DEEP were consulted? Please describe any recommendations, comments or concerns about the project provided by the DEEP Stormwater Division. Would the on-site wetland detention basin require consultation with the Dam Safety Division?***

Petitioner consulted with the Natural Diversity Database at DEEP and that information was included in the petition filing. In addition, Petitioner will consult with the DEEP Stormwater division upon Siting Council approval of the proposed Project. The berm for the constructed wetland basin does not require a permit from the Dam Safety Division as the berm is four feet (4') or less above original grade.

40. ***Based on the soil and subsurface testing, do site conditions support the overall project design, including the location of proposed stormwater control features? Would rock chipping and/or blasting be required to install site components and/or stormwater features?***

Based upon the extensive soil testing which was done for the subdivision, it is not anticipated that rock will be encountered in the constructed wetland basin. If rock is encountered, which is above the proposed bottom of the basin, it would be chipped/hammered out. No blasting would be proposed.

41. ***What is the specific function of the wetland detention basin? How will it function in summer if the designed one-foot pool level dries out and wetland plants die off? How will it function in the winter if the pool is frozen or the plants are dormant or dead?***

The constructed wetland basin provides multiple functions including:

1) improvement of runoff quality which will be discharged to the intermittent stream by having a long, back and forth flow path increasing the contact time between the runoff and the soils and vegetation in the bottom of the basin;

2) a staged outlet structure will contain the Water Quality Volume below the lowest orifice per the CT DEP 2004 Storm Water Quality Manual;

3) provide the Channel Protection Volume per the 2004 DEP Manual, reducing the post-development peak rate of 20.29 cfs to 4.28 cfs for the 2-year rainfall event which is less than 50% of the pre-development peak rate of 9.38 cfs.

The basin also provides peak rate reduction for all other design storms. During the winter it is possible to have ice on the water surface in the basin, however, the ground will likely be covered with snow, so there is no runoff going to the basin. Snow blankets the ground surface and a depth of snow (6" or more) insulating the ground and thus any frost in the upper soil layer melts and when the snow starts to melt, it infiltrates into the ground and does not become surface runoff. While the plants are dormant in the winter, the root systems are active and continue to provide treatment of runoff which may drain to the basin.

42. ***Provide a cross section detail of the proposed wetland detention basin***.

Please see revised plans attached hereto as Exhibit A.

43. ***Provide a slope profile of the three proposed drainage swales. The design of the swale system shows the east and west swales meeting at the top of the larger swale- could high flow storms cause erosive forces that could result in swale failure or damage at the point where all three swales meet?***

Please see revised plans attached hereto as Exhibit A. A section (profile) of each swale is being provided for the two (2) grass swales and one riprap swale. In preparing the section of the eastern grass swale, Petitioner determined that at one section south of the array would have more earthwork than initially anticipated. The alignment of the eastern grass swale was revised to more closely follow the existing contours. This slight modification does not affect the design or capacity of the eastern grass swale. The swale is an average of two feet (2') in depth relative to existing grade.

There is no concern of swale failure or damage at the top of the proposed riprap swale for the following reasons:

1) flow velocities in both grass swales are less than three feet (3') per second which are non-erosive for upland soils in the grass swales;

2) swales are designed to pass the 10-year rainfall event, which is 6" in 24-hours while 90% of all of our annual rainfall events are one inch (1") or less in 24-hours;

3), stone checks are being utilized in the swale create temporary ponded areas above each check dam which will allow some runoff to infiltrate in the soil;

4) the riprap swale at the convergence point to the constructed wetland basin has been sized to fully contain the runoff from the 10-year storm and not cause any erosion as it is located on a steeper slope than the grass swales.

44. ***Does the large swale leading to the plunge pool have any velocity dissipaters beyond the 9-inch rip rap bottom? Would high storm events cause runoff to flow at a high velocity into the detention basin plunge pool, thus suspending and dispersing accumulated sediment from the plunge pool into the wetland portion of the detention basis, and ultimately into the adjacent watercourse?***

No, an additional energy dissipator is not necessary as runoff enters a pool of the water in the forebay and does not discharge onto the bare ground. The forebay is six feet (6') in depth (meeting the requirement of the CT DEP 2004 Storm Water Quality Manual), and any sediment which is discharged to the forebay settles out at the bottom of the forebay. New runoff enters the forebay at the top of the permanent pool of water in the forebay which stills the velocity of the runoff entering from the swale and thus prevents the new runoff from disturbing any accumulated sediments in the bottom of the forebay. There will be minimal, if any sediment build-up in the forebay as there is no source of sediment from an impervious area draining to the forebay. As the forebay has been designed fully complying with the standards found in the 2004 Manual (noted above), any accumulated sediment will not be discharged from the forebay to the larger constructed wetland portion of the basin or potentially to the downstream watercourse. There is a permanent pool (12" or less in depth) within the larger portion of the basin, so additional settlement of suspended particles will further occur in this area. The outlet structure for the basin provides a retention time for rainfall events which will be a minimum of 24 hours after a rainfall event less than 3" in 24-hours and up to 48 hours for larger rainfall events. During large storm events, the basin is large enough to provide adequate retention time to allow natural sedimentation to occur and thus reduce the turbidity levels to within adequate discharge limits. The outlet control structure is also sized to throttle water discharge rates so that it does not cause excessive flow into adjacent wetlands. The table below (reproduced below from Exhibit B attached hereto (revised stormwater report) shows the reductions in the peak rate of runoff which will occur in the constructed wetland basin. To protect the natural integrity of the adjacent watercourse, the Channel Protection Volume (CPV) is the most critical criteria to meet. The CPV reduces the post-development peak rate for the 2-year rainfall event to 50% of the pre-development peak rate for the 2-year rainfall event while extending the duration of discharge from the basin. These criteria prevents the stream channel from eroding.

The table below shows the reductions of peak rates of runoff from Constructed Wetlands:

Storm Event	**Pre-development**	**Post to CW**	**CW Discharge**	**Net Change**
WQ storm	0.03 cfs	2.28 cfs	0.06 cfs	+0.03 cfs
1-year	5.30 cfs	14.56 cfs	2.26 cfs	-3.04 cfs
2-year	9.38 cfs	20.29 cfs	4.28 cfs	-5.10 cfs

5-year	17.00 cfs	29.72 cfs	8.13 cfs	-8.87 cfs
10-year	23.92 cfs	37.60 cfs	17.59 cfs	-8.39 cfs
25-year	33.90 cfs	48.36 cfs	34.96 cfs	+1.06 cfs
50-year	41.28 cfs	56.06 cfs	42.12 cfs	+0.84 cfs
100-year	49.72 cfs	64.69 cfs	50.34 cfs	+0.62 cfs

45. ***Was the larger swale leading to the plunge pool modeled within the stormwater calculations? If so, where is it identified?***

It was to confirm the adequacy to contain the flows from the 10-year rainfall event per the CT DEP 2004 Manual. The requested calculation has been added to the stormwater management report, attached hereto as Exhibit B.

46. ***Was a swale depth of 2 feet used in the stormwater calculations? If so, was the depth to the soil or rip rap installed within the swales accounted for?***

The depth of the swale used in the calculations is to the top of the riprap service. The depth of riprap and soil underneath do not factor into the computations.

47. ***Why was the plunge pool designed as conical in shape rather than being designed with a uniform depth? Is a uniform depth recommended in the 2004 Connecticut Stormwater Quality Manual? How will the depth of the conical plunge pool be cleaned of sediment without damaging the sides? What is the average depth of the plunge pool?***

The forebay was designed in full compliance with the CT DEP 2004 Storm Water Quality Manual. It has a 6' depth (manual suggests 4-6'), it meets the minimum 2:1 length to width ratio from inlet to outlet, the side slopes are at 2:1 per the manual. You cannot have a forebay with vertical walls as it creates a safety issue.

Environmental

48. ***Referring to Petition Attachment 12, what is the status of the archeological assessment requested by the State Historic Preservation Office?***

The archeological assessment is in process and expected to be completed by the end of May, 2020. Such report will be submitted to both the Siting Council and the SHPO upon receipt.

49. ***Referring to Petition pp. 15-16, does the United States Environmental Protection Agency's Greenhouse Gas Equivalency Calculator allow for a Carbon Debt Analysis to include the exceptions listed on p. 16? If so, please provide.***

The analysis provided by Petitioner does not account for energy used as part of material extraction; solar panel manufacturing and production; manufacturing of balance of system components or Project installation. It also does not include the carbon dioxide that is expected to be released from the tree removal. *See also* Exhibit 5 attached to the Petition.

50. ***Is the onsite wetland/stream along the west portion of the site a tributary of Taylor Brook? Is Taylor Brook a cold-water fishery that supports wild brook trout?***

The western intermittent stream is a tributary to Taylor Brook. The confluence point is at the southern end of the property, approximately one thousand six hundred feet (1,600') from the outlet of the constructed wetland basin. Based on Petitioner's review, Taylor Brook does not support wild brook trout.

51. ***Does the 2004 Connecticut Stormwater Quality Manual recommend the use of wetland detention basins that discharge into cold water fisheries? If not, what stormwater design alternatives can be used at this site to reduce any thermal impacts to the western watercourse?***

Yes, as a constructed wetland system has a very shallow pool which is less than 12" in depth and densely vegetated which shades the water surface and cools the water within the bottom of the basin.

52. ***What is the distance from the solar array access drive along the west side of the array to the nearest wetland boundary?***

The closest point of the west side access driveway to a delineated inland wetland boundary is one hundred sixteen feet (116').

53. ***Would the proposed project be consistent with the 2015 U.S. Army Corps of Engineers Vernal Pool Best Management Practices? Please explain***.

Yes, as there is no activity within one hundred feet (100') of either vernal pool. The two vernal pools on the site are located to the northeast of the solar array and are very small in size, approximately one hundred (100) square feet each. They are marginal quality for breeding species (see petition Exhibit

8). The closest vernal pool is over four hundred sixty eight feet (468') from the northeast limit of clearing.

54. ***By maintaining a permanent pool in the wetland detention basin, could the basin act as a decoy pool to vernal pool species that may utilize the on-site wetland corridors?***

The Petitioner does not believe that this would occur.

55. ***Petition Attachments 9 & 10 contain different values for the distance to the nearest vernal pool from the solar array, please clarify***.

From the northeast corner of Row #1 of the solar array to the closest corner of the vernal pool is five hundred forty-nine and four tenths feet (549.4').

56. ***What is the rationale for diverting stormwater from the eastern on-site drainage area to the western on-site drainage area? Is this practice consistent with the 2002 Guidelines? Would reduced overland flow affect the downgradient wetlands? What studies were undertaken to determine such diversion?***

There is no diversion of runoff. Runoff from the eastern side of the solar arrays would drain to the east to the wetland located at the base of the slope along the eastern property line of the site. This wetland drains to the south to Taylor Brook which is the same discharge point for the western portion of the Site.

57. ***Can a detention basin, or other types of water control features, be constructed within the eastern drainage area to reduce the amount of water diversion from one drainage area to another, as well as reduce the swale length and associated maintenance?***

As noted above in interrogatory #56, there is no diversion. Yes, a basin could be constructed, but on the steep slopes would require a significant amount of earth disturbance to be done, thus increasing the potential for erosion and sedimentation issues during construction. Additionally, the discharge from a basin on the east side of the site would have to be conveyed through a pipe or large riprap swale to the wetland at the bottom of the slope requiring significant site disturbance. This is necessary to prevent erosion of an upland slope by the concentrated discharge of runoff.

58. ***Referring to Petition Attachment 10, where were approved subdivision sediment basins and constructed marsh located on the property?***

The previously approved subdivision had numerous sediment traps located near the proposed road to handle construction runoff from the road only during the construction period and are not applicable to this proposed solar array. There were numerous stormwater practices proposed on the subdivision: A constructed wetlands, a subsurface gravel flow wetlands, infiltration trenches, hydrodynamic separator, bioretention systems, and a long vegetated level spreader.

59. ***Petition p. 4 states 75 acres of the site will be donated to the Winchester Land Trust upon approval of the Project and commencement of the lease. Would discharge of the wetland detention basin occur at the updated land trust property line and flow into a wetland/watercourse on the land trust property?***

Yes.

60. ***Please submit photographic site documentation with notations linked to the site plans or a detailed aerial image that identifies the locations of site-specific and representative site features. The submission should include photographs of the site from public road(s) or publicly accessible area(s) as well as Site-specific locations depicting site features including, but not necessarily limited to, the following locations as applicable:***

For each photo, please indicate the photo viewpoint direction and stake or flag the locations of site-specific and representative site features. Site-specific and representative site features include, but are not limited to, as applicable:

1. ***wetlands, watercourses and vernal pools;***
2. ***forest/forest edge areas;***
3. ***agricultural soil areas;***
4. ***sloping terrain;***
5. ***proposed stormwater control features;***
6. ***nearest residences;***
7. ***Site access and interior access road(s);***
8. ***utility pads/electrical interconnection(s);***
9. ***clearing limits/property lines;***
10. ***mitigation areas; and***
11. ***any other noteworthy features relative to the Project.***

A photolog graphic must accompany the submission, using a site plan or a detailed aerial image, depicting each numbered photograph for reference. For each photo, indicate the photo location number and viewpoint direction, and clearly identify the locations of site-specific and representative site features show (e.g., physical staking/flagging or other means of marking the subject area).

The submission shall be delivered electronically in a legible portable document format (PDF) with a maximum file size of <20MB. If necessary, multiple files may be submitted and clearly marked in terms of sequence.

Please see photo documentation attached hereto as Exhibit C.

Facility Maintenance

61. ***What is the anticipated frequency of clearing in areas outside of the solar array perimeter fence and how would clearing be accomplished if stumps are to remain?***

The proposed frequency of clearing of areas outside of the array is anticipated to be once every ten (10) years. In the event this is required, this will be accomplished using hand tools and stumps would remain.

62. ***Would pesticides or herbicides be used at the site? If so, specify anticipated products and use***.

Pesticides and herbicides will not be used at the Site by Petitioner.

63. ***The Operations and Maintenance Plan does not contain specific post-construction inspection, maintenance, or corrective action protocols for the wetland detention pond and associated stormwater control swales. Please provide details consistent with the 2004 Connecticut Stormwater Quality Manual and the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control***.

Maintenance requirements for the constructed wetland and grass swales have been added to the revised plans, attached hereto as Exhibit A. Both of these systems were chosen as they require minimal maintenance to function properly and such maintenance complies with the 2004 Stormwater Quality Manual and 2002 Soil Erosion and Sediment Control guidelines.

64. ***There is no access road to the wetland detention basin or swales on the southeast and east sides of the site. How will access be provided to facilitate repairs and to maintain these features? What equipment will be used for access, repairs, and maintenance?***

The swales have been designed to not require maintenance as there is no source of sediment to get to the swales. Any maintenance of the eastern grass swale can be done on foot to shovel to clean any debris from the swale. Similarly, for the constructed wetland basin, a mini-excavator shall drive down the natural slope parallel to the riprap swale to the basin to perform sediment removal from the forebay if necessary.

65. H***ow will sediment be removed and transported from the wetland detention basin and swales? Where would accumulated sediment be disposed of?***

The proposed gravel roadways, which were considered to be impervious as part of the stormwater model will not generate sediment, nor will there be sand (winter operations) applied, so no sediment load will be directed to the swales.

66. ***Referring to the Decommissioning Plan, is the intent to remove the swale/wetland detention basin system and the gravel road wetland crossings? Will tree seedlings be planted to restore the area to pre-existing conditions?***

Petitioner proposes to leave the constructed wetland basin in place. The outlet control structure will be removed, leaving the outlet pipe to allow water to freely drain from the basin to the natural wetland. The swales will also be left in place Petitioner proposes to leave the actual wetland crossings in place as well as removal may cause more environmental harm to the wetland.

Respectfully submitted,

Petitioner
LSE PICTOR LLC

By: Carrie Larson Ortolano
Jeffrey J. Macel, Manager
Carrie Larson Ortolano, Associate General Counsel
% Lodestar Energy LLC
40 Tower Lane, Suite 201
Avon, CT 06001

EXHIBIT A
(Revised Site Plans)

EXHIBIT B
(Revised Stormwater Management Plan)

EXHIBIT C
(Photolog Documentation)

SITE DEVELOPMENT PLANS
PROPOSED 1.99 MW SOLAR ARRAY
PLATT HILL ROAD
WINCHESTER, CONNECTICUT
PREPARED FOR LODESTAR ENERGY

PLAN LIST: MARCH 6, 2020

REVISED PER COMMENTS OF SITING COUNCIL: MAY 1, 2020

LOW IMPACT SUSTAINABLE DEVELOPMENT TRINKAUS ENGINEERING

TRINKAUS ENGINEERING, LLC
CIVIL ENGINEERS
114 HUNTERS RIDGE ROAD
SOUTHBURY, CONNECTICUT 06488
203-264-4558 (phone)
Email: strinkaus@earthlink.net
Website: http://www.trinkausengineering.com

PREPARED FOR
LODESTAR ENERGY
PLATT HILL ROAD
WINCHESTER - CONNECTICUT

OVERALL PLAN
SHEET 1 OF 13
PROJECT #032-2019
SCALE: 1"= 80'
DATE: 3/6/2020, Rev. 5/1/20

LOW IMPACT SUSTAINABLE DEVELOPMENT
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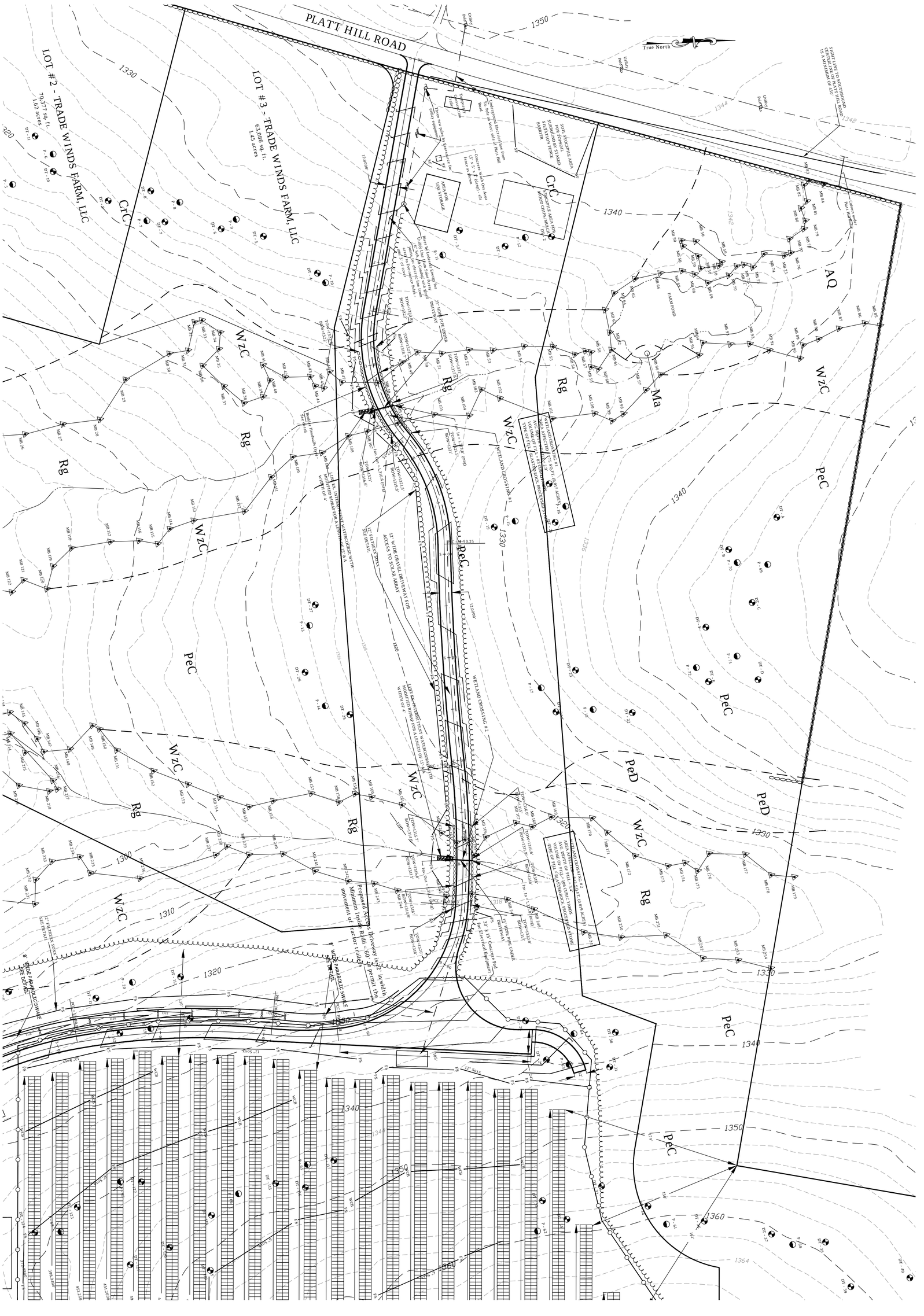

PREPARED FOR
LODESTAR ENERGY
PLATT HILL ROAD
WINCHESTER - CONNECTICUT

SITE DEVELOPMENT PLAN
SHEET 2 OF 13
PROJECT #032-2019
SCALE: 1"= 40'
DATE: 3/6/2020, Rev. 5/1/20

LOW IMPACT SUSTAINABLE DEVELOPMENT
TRINKAUS ENGINEERING

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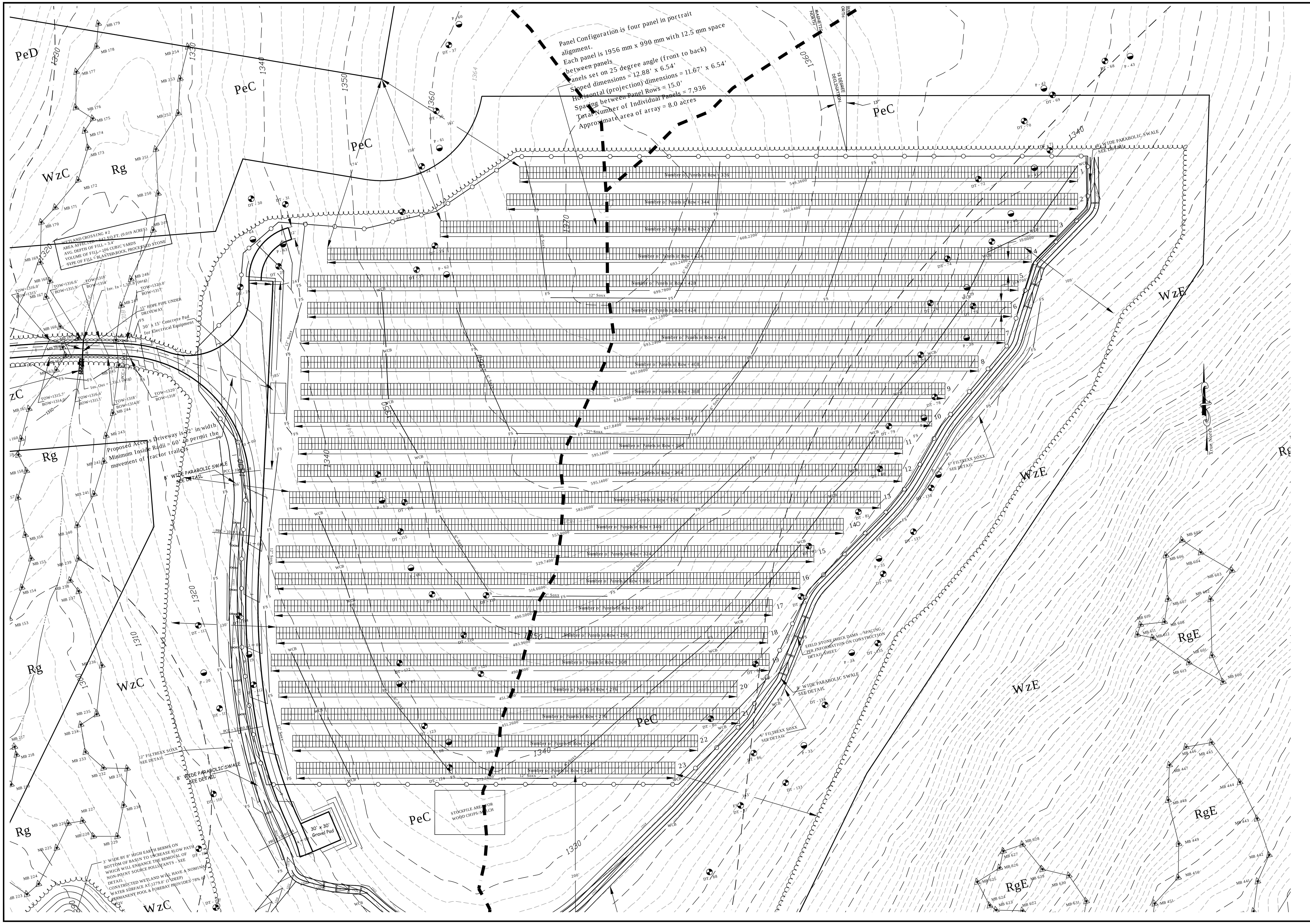

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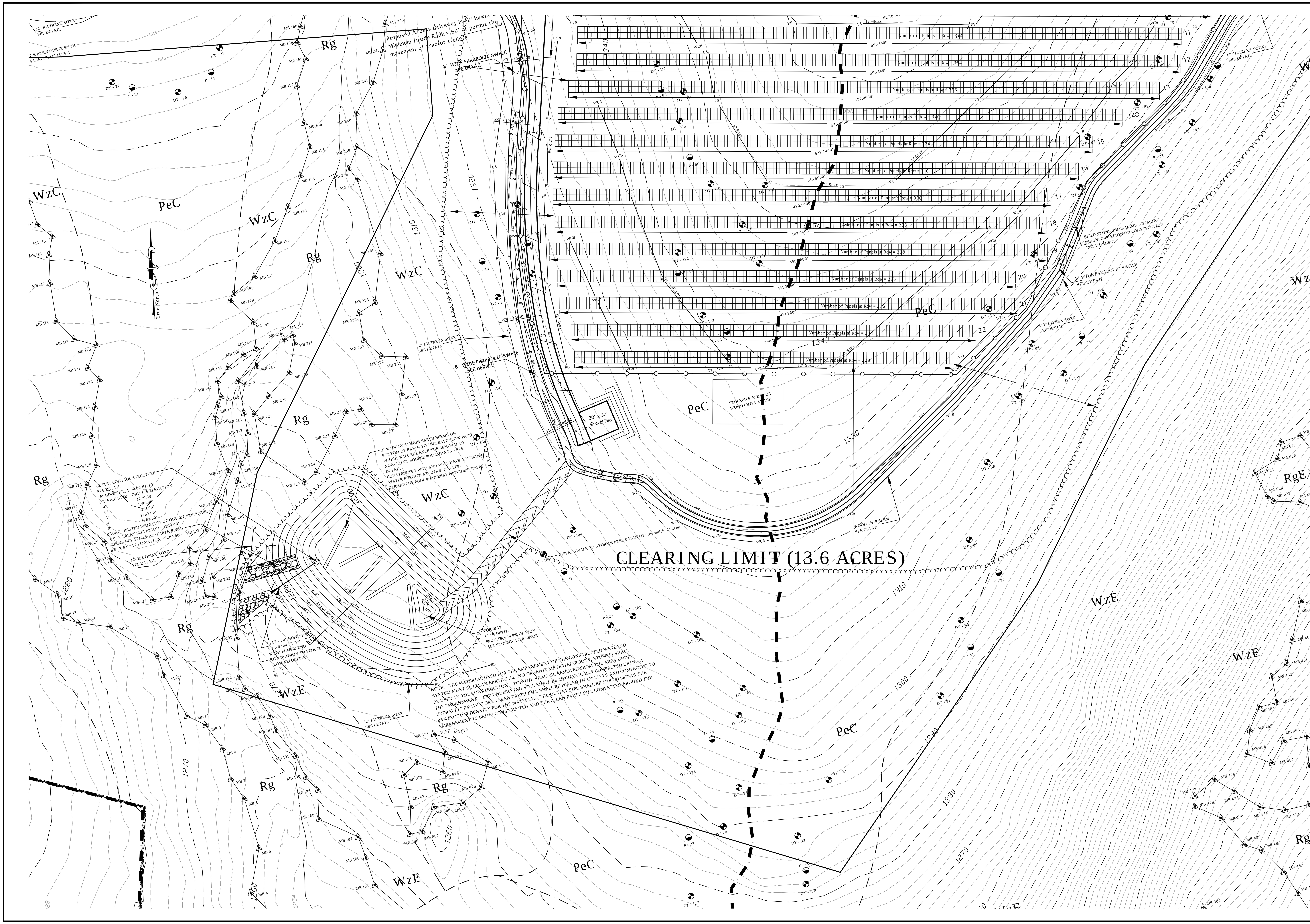
LOW IMPACT SUSTAINABLE DEVELOPMENT
TRINKAUS ENGINEERING

SITE DEVELOPMENT PLAN
SHEET 3 OF 13
PROJECT #032-2019
SCALE: 1"= 40'
DATE: 3/6/2020, Rev. 5/1/20

PREPARED FOR
LODESTAR ENERGY
PLATT HILL ROAD
WINCHESTER - CONNECTICUT



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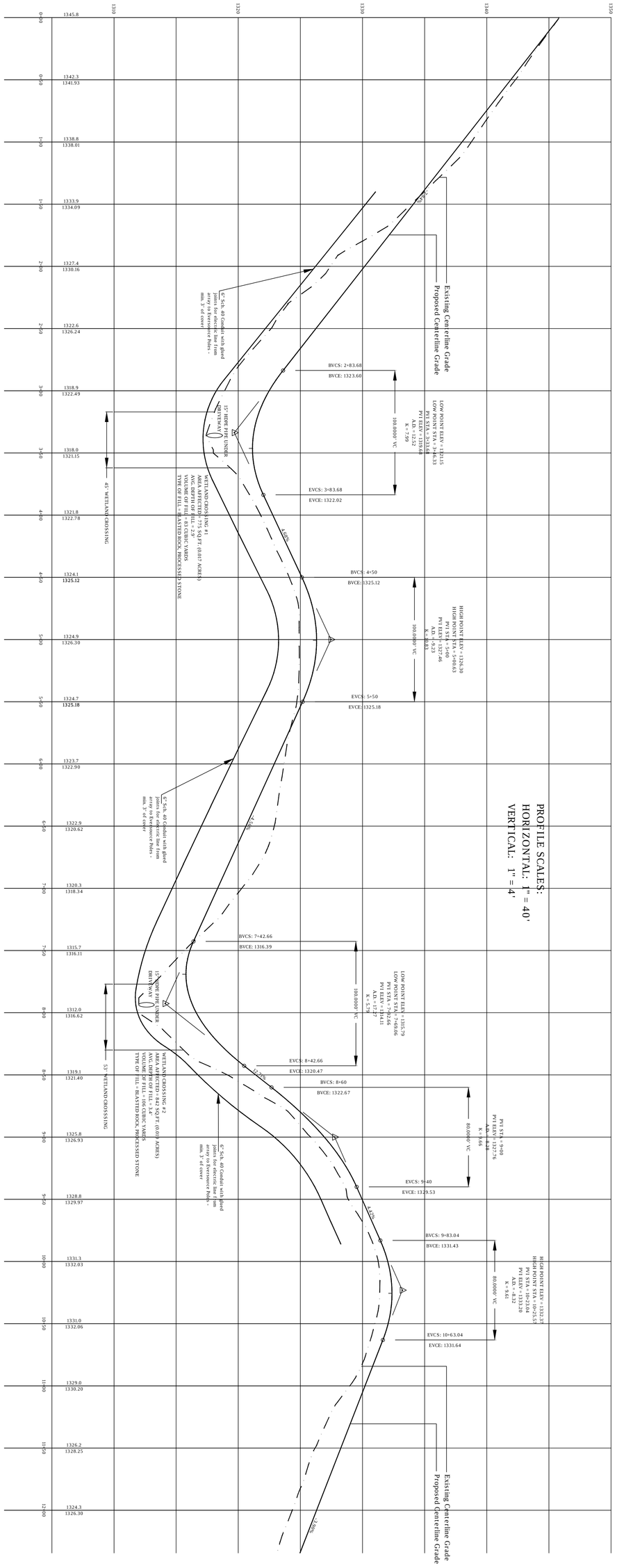
LOW IMPACT SUSTAINABLE DEVELOPMENT
TRINKAUS ENGINEERING

SITE DEVELOPMENT PLAN
SHEET 4 OF 13
PROJECT #032-2019
SCALE: 1"= 40'
DATE: 3/6/2020, Rev. 5/1/20

PREPARED FOR
LODESTAR ENERGY
PLATT HILL ROAD
WINCHESTER - CONNECTICUT



PREPARED FOR
LODESTAR ENERGY
PLATT HILL ROAD
WINCHESTER - CONNECTICUT

PROFILE OF ACCESS DRIVEWAY
SHEET 5 OF 13
PROJECT #032-2019
SCALES AS NOTED
DATE: 3/6/2020, 5/1/20

LOW IMPACT SUSTAINABLE DEVELOPMENT
TRINKAUS ENGINEERING

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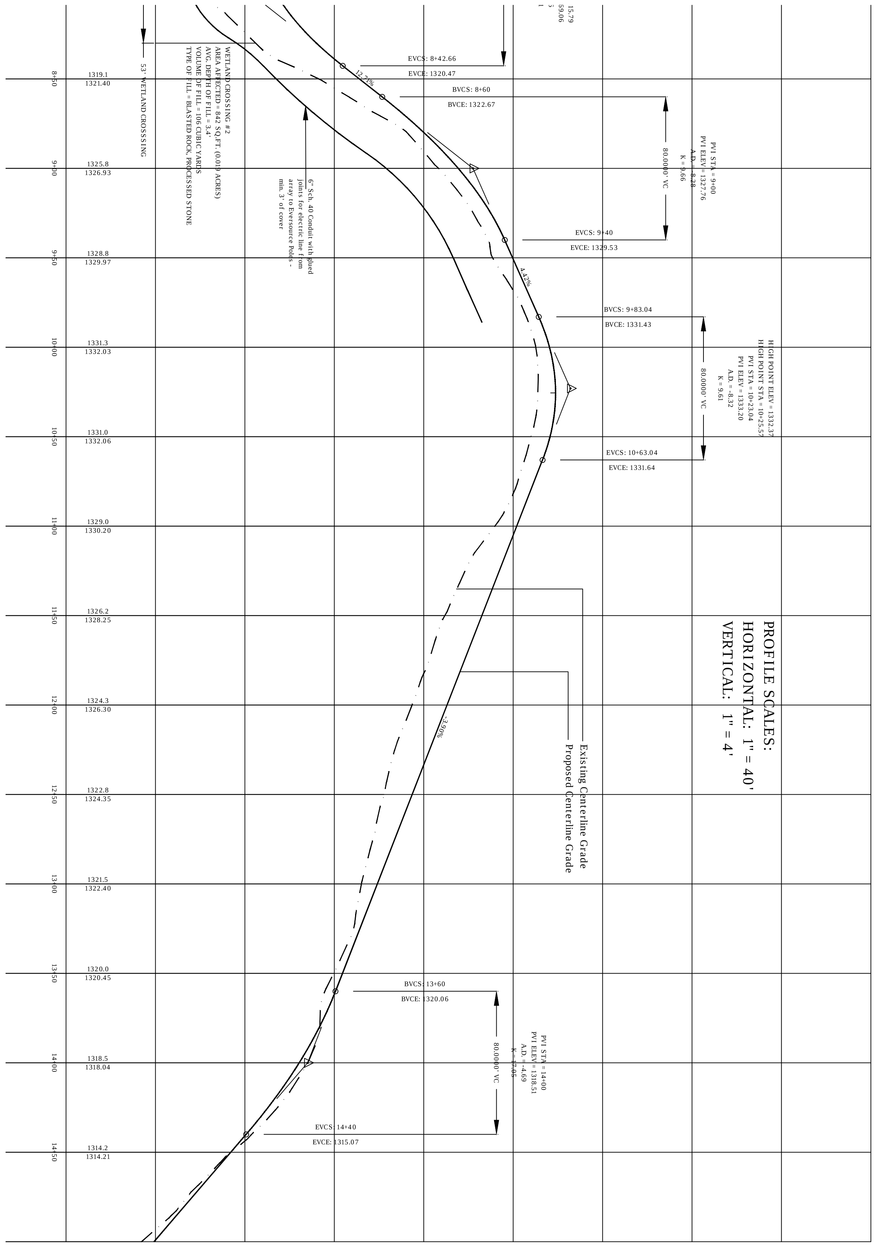

PREPARED FOR
LODESTAR ENERGY
PLATT HILL ROAD
WINCHESTER - CONNECTICUT

PROFILE OF ACCESS DRIVEWAY
SHEET 6 OF 13
PROJECT #032-2019
SCALES AS NOTED
DATE: 3/6/2020, Rev. 5/1/20

LOW IMPACT SUSTAINABLE DEVELOPMENT
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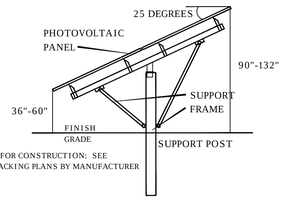
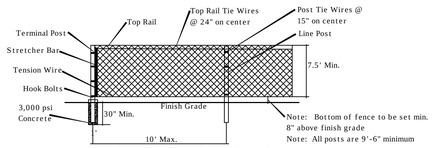


NOTE: NOT FOR CONSTRUCTION: SEE DETAILED RACKING PLANS BY MANUFACTURER

CROSS SECTION OF TYPICAL RAKING SYSTEM
NOT TO SCALE



Note: Round 5" or 6" Pressure Treated Posts driven to a minimum depth of 30". All Terminal Posts shall be set in concrete

CONSTRUCTION NOTES:
1. MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE MANUFACTURER'S SPECIFICATIONS.
2. ALL POSTS SHALL BE INSTALLED VERTICALLY.
3. GRADUATED MESH OPENING UP TO 6" WIDE SPACES (SMALL SPACES AT BOTTOM TO KEEP SMALL ANIMALS OUT)
SIZES 6" WIDE SPACING - CLASS 3, 6 LINES OF 3", 2 LINES OF 4", 2 LINES OF 5" (HOT DIP GALVANIZED - WOVEN WIRE)

SHAPE, SIZE AND WEIGHT REQUIREMENTS FOR FENCE POSTS AND RAILS

ITEM	SHAPE	OUTSIDE DIMENSIONS (INCHES)	WEIGHT LBS/LF
** TERMINAL POST	ROUND *ROUND	5-6" 5-6"	9.37 9.37
LINE POST	ROUND *ROUND	1.90 1.90	2.72 2.28
TOP & BRACE RAILS	ROUND *ROUND	1.66 1.66	2.27 1.84

* GRADE B HIGH STRENGTH STEEL
** INCLUDES END, CORNER, ANGLE, INTERSECTION AND INTERMEDIATE BRACED POSTS

GATE FRAME MEMBERS (SIZE & WEIGHT)

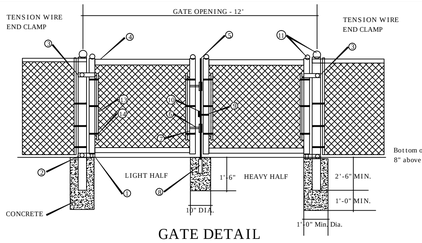
GATE FRAME	OUTSIDE DIMENSIONS (")	WEIGHT (LBS/LF)
ROUND	1.66	2.27
*ROUND	1.66	1.84

* GRADE B HIGH STRENGTH STEEL

GATE POST (SIZE & WEIGHT)

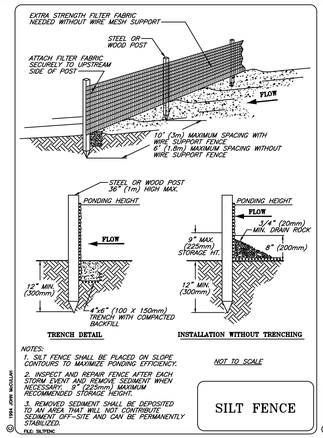
GATE WIDTH	OUTSIDE DIMENSIONS (")	WEIGHT (LBS/LF)
ROUND	2.875	5.79
*ROUND	2.875	4.64

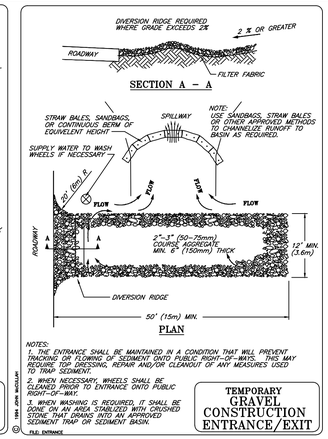
* GRADE B HIGH STRENGTH STEEL



Part #	Description	Quantity
1	Straight Plug	2
2	Bottom Hinge	2
3	Top Hinge	2
4	Corner Elbow	8
5	Plunger Rod	1
6	Latch Fork	2
7	Fork Catch	2
8	Plunger Rod Catch	1
9	Lock Keeper Guide	1
10	Lock Keeper	1
11	Ornamental Tops	6
12	Truss Rods	4
13	Stretcher Bar	4
14	Hook Bolts	12

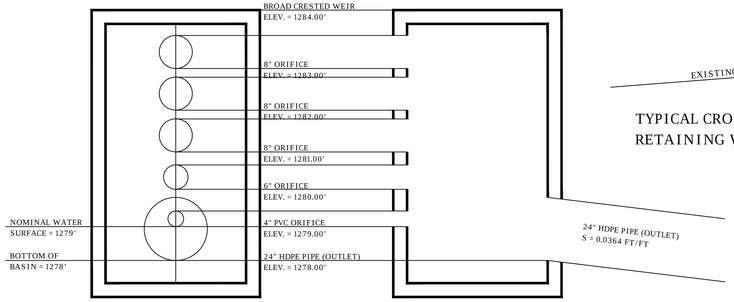
GATE DETAIL
NOT TO SCALE



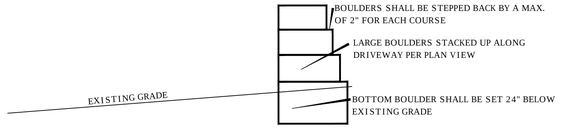


Note: Berms shall be made from topsoil or Sandy/silty loam from the site in order to support the establishment of vegetation

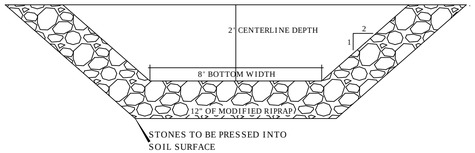
DETAIL OF EARTH BERMS IN CONSTRUCTED WETLAND SYSTEM - NOT TO SCALE



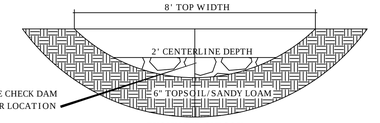
DETAIL OF OUTLET CONTROL STRUCTURE
NOT TO SCALE



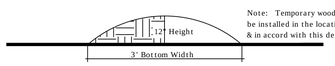
TYPICAL CROSS SECTION OF BOULDER RETAINING WALL - NOT TO SCALE



SECTION OF EMERGENCY SPILLWAY
NOT TO SCALE

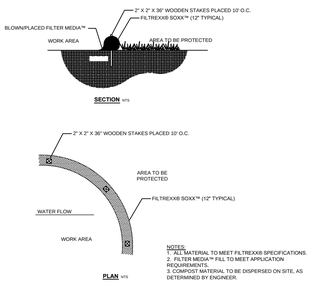


CROSS SECTION OF PARABOLIC GRASS SWALE ALONG EAST & WEST SIDES OF SOLAR ARRAY
NOT TO SCALE



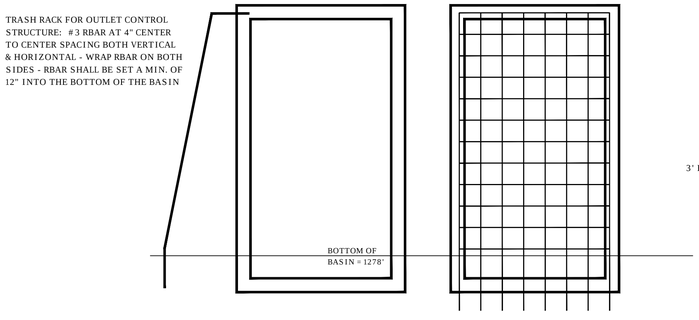
Note: Temporary wood chips berms shall be installed in the locations shown on the plan & in accord with this detail

DETAIL OF TEMPORARY WOOD CHIP BERMS
NOT TO SCALE

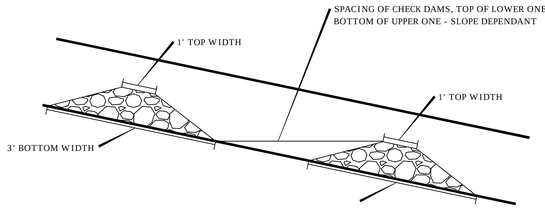


FILTREXX® SEDIMENT CONTROL
NTS

ALTERNATIVE COMPOST SOCKS WHICH ARE AN APPROVED EQUIVALENT TO THE FILTREXX SOXX MAY BE USED



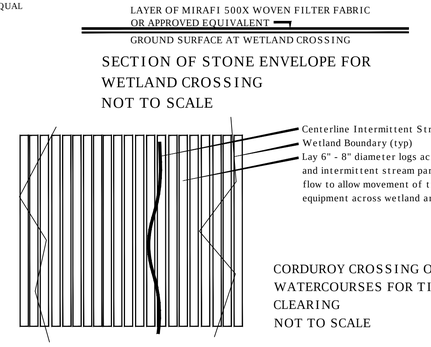
DETAIL OF TRASH RACK FOR OUTLET CONTROL STRUCTURE
NOT TO SCALE



CROSS SECTION OF PARABOLIC GRASS SWALE WITH FIELD STONE CHECK DAM
NOT TO SCALE

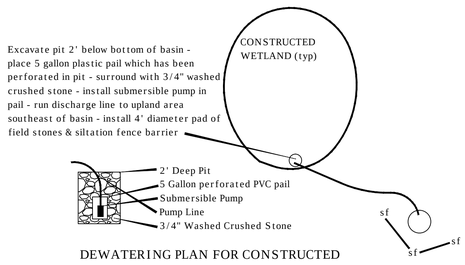
SPACING OF CHECK DAMS

SLOPE	SPACING
1%	100'
2%	50'
3%	33'
4%	25'
5%	20'
6%	16'
7%	14'

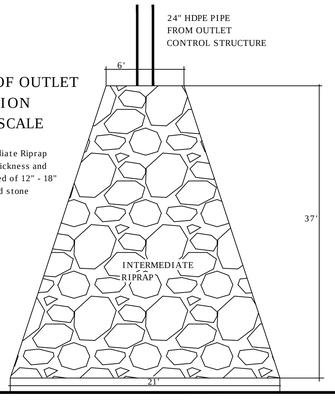


SECTION OF STONE ENVELOPE FOR WETLAND CROSSING
NOT TO SCALE

CORDUROY CROSSING OF WETLAND/ WATERCOURSES FOR TIMBER CLEARING
NOT TO SCALE

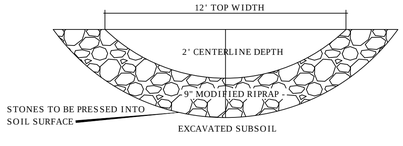


DEWATERING PLAN FOR CONSTRUCTED WETLANDS IF REQUIRED
NOT TO SCALE

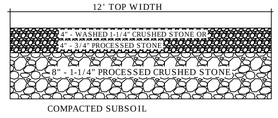


DETAIL OF OUTLET PROTECTION
NOT TO SCALE

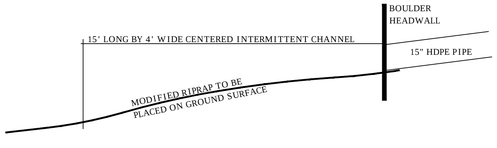
Note: Intermediate Riprap shall be 18" in thickness and shall be comprised of 12" - 18" diameter crushed stone



CROSS SECTION OF PARABOLIC RIPRAP SWALE FROM SOLAR ARRAY TO CONSTRUCTED WETLANDS
NOT TO SCALE



CROSS SECTION OF ACCESS DRIVEWAY
NOT TO SCALE



TYPICAL SECTION OF MODIFIED RIPRAP OUTLET PROTECTION AT WETLAND CROSSINGS
NOT TO SCALE

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LOW IMPACT SUSTAINABLE DEVELOPMENT
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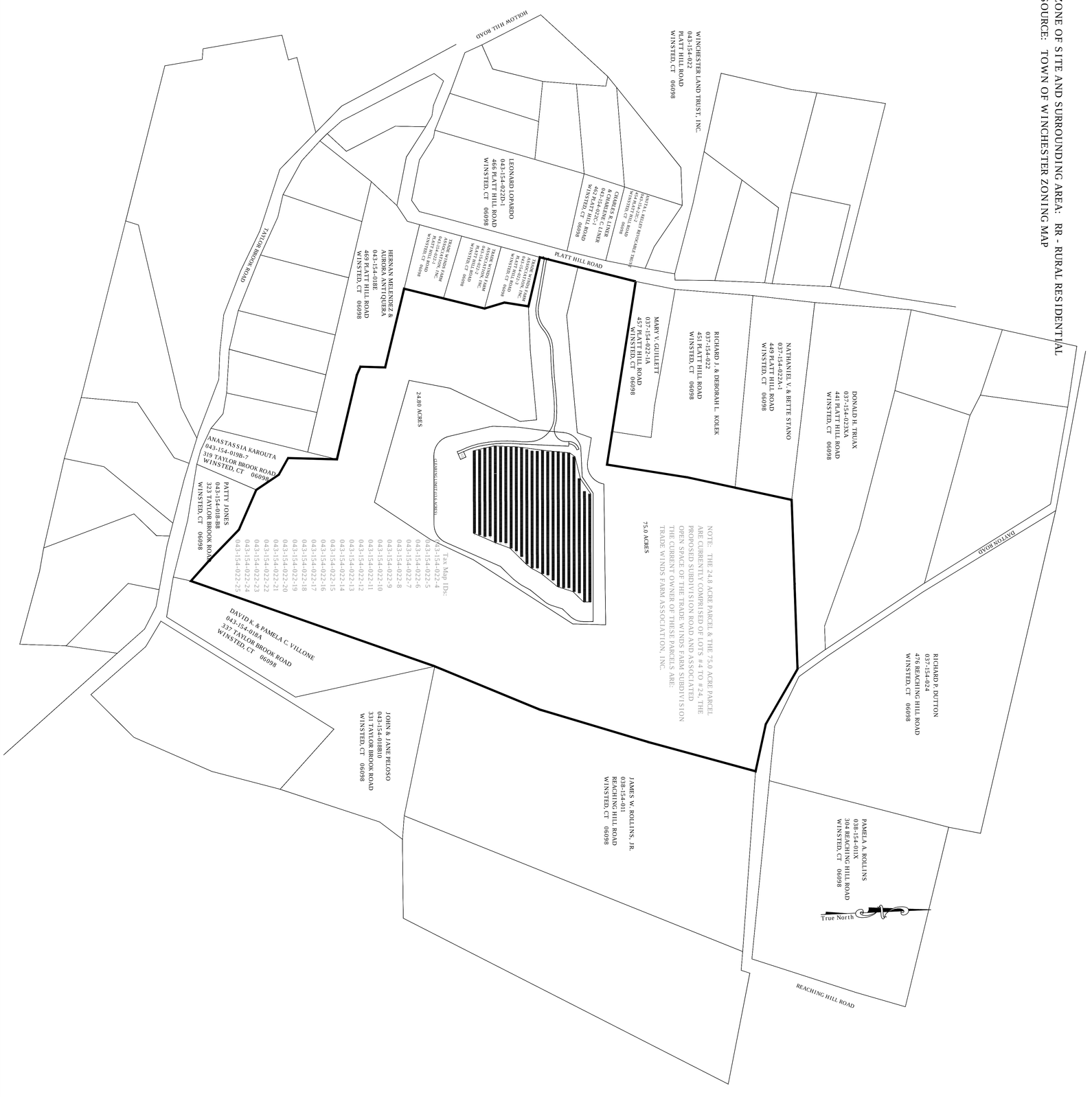
CONSTRUCTION DETAILS
SHEET 7 OF 13
PROJECT #032-2019
SCALES AS NOTED
DATE: 3/6/2020, Rev. 5/1/20

PREPARED FOR
LODESTAR ENERGY
PLATT HILL ROAD
WINCHESTER - CONNECTICUT

ZONE OF SITE AND SURROUNDING AREA: RR - RURAL RESIDENTIAL
SOURCE: TOWN OF WINCHESTER ZONING MAP



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VICINITY MAP
SHEET 8 OF 13
PROJECT #032-2019
SCALE: 1" = 250'
DATE: 3/6/2020, Rev. 5/1/20

LOW IMPACT SUSTAINABLE DEVELOPMENT
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PHASE I:

1. FIELD STAKING OF CLEARING LIMIT FOR ACCESS DRIVEWAY AND SOLAR ARRAY.
2. CUTTING OF TREES AND BRUSH WITHIN CLEARING LIMITS. BRUSH SHALL BE CHIPPED TO BE USED AS TEMPORARY MULCH DURING THE CONSTRUCTION PERIOD AS NEEDED.
3. INSTALLATION OF EROSION CONTROL BARRIERS ALONG ACCESS PATH AND PERIMETER OF SOLAR ARRAY/SWALES/CONSTRUCTED WETLAND BASIN.

True North

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PLATT HILL ROAD
WINCHESTER - CONNECTICUT

PHASING PLAN -PHASE I
SHEET 9 OF 13
PROJECT #032-2019
SCALE: 1" = 80'
DATE: 3/6/2020, Rev. 5/1/20

LOW IMPACT SUSTAINABLE DEVELOPMENT
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PHASE II:

1. REMOVAL OF STUMPS WITHIN AREA OF ACCESS DRIVEWAY. EAST AND WEST SWALES AND CONSTRUCTED WETLAND SYSTEM.
2. DISPOSAL OF STUMPS OFF-SITE OR GRINDING OF THEM INTO MULCH ON-SITE.
3. CONSTRUCTION OF ACCESS DRIVEWAY FROM PLATT HILL ROAD TO SOUTHERN END INCLUDING TWO INTERMITTENT STREAM CROSSINGS.
4. AFTER ACCESS DRIVEWAY HAS BEEN CONSTRUCTED AND SIDE SLOPES GRADED, INSTALL PARABOLIC SWALES ON EAST & WEST SIDES OF PROPOSED SOLAR ARRAY.
5. CONSTRUCT COMBINED SWALE AND CONSTRUCTED WETLAND SYSTEM PER PLAN AND DETAILS. SEED ALL DISTURBED AREAS WITH SPECIFIED SEED MIXTURE ON APPROVED PLANS.

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PHASING PLAN -PHASE II
SHEET 10 OF 13
PROJECT #032-2019
SCALE: 1" = 80'
DATE: 3/6/2020, Rev. 5/1/20

LOW IMPACT SUSTAINABLE DEVELOPMENT
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PHASE III A:

1. INSTALLATION OF EROSION CONTROL MEASURES FOR CONSTRUCTION OF SOLAR ARRAY IN PHASE III A. ALL EROSION MEASURES TO BE INSTALLED IN ACCORDANCE WITH APPROVED PLANS AND DETAILS (FILTREXX SOXX AND WOOD CHIP BERMS PER PLAN).
2. USE YORK RAKE OR SIMILAR EQUIPMENT TO REMOVE LOOSE BRUSH AND SCARIFY GROUND SURFACE. INSTALL STEEL RACKING SYSTEM FOR SOLAR PANELS PER MANUFACTURER'S SPECIFICATIONS.
3. INSTALL SOLAR PANELS ON RACKING SYSTEM.
4. SEED AREAS UNDER AND BETWEEN ROWS OF SOLAR PANELS WITH SPECIFIED SEED MIXTURE.
5. EROSION CONTROL MEASURES TO REMAIN IN PLACE UNTIL PERMANENT VEGETATIVE COVER HAS BEEN ESTABLISHED OVER THE DISTURBED AREA.
6. 6" FILTREXX SOXX & WOOD CHIP BERMS REMAIN IN PLACE TO SLOW RUNOFF DOWN UNTIL VEGETATION GROWS UP.

PHASE III B:

1. INSTALLATION OF EROSION CONTROL MEASURES FOR CONSTRUCTION OF SOLAR ARRAY IN PHASE III B. ALL EROSION MEASURES TO BE INSTALLED IN ACCORDANCE WITH APPROVED PLANS AND DETAILS (FILTREXX SOXX AND WOOD CHIP BERMS PER PLAN).
2. USE YORK RAKE OR SIMILAR EQUIPMENT TO REMOVE LOOSE BRUSH AND SCARIFY GROUND SURFACE. INSTALL STEEL RACKING SYSTEM FOR SOLAR PANELS PER MANUFACTURER'S SPECIFICATIONS.
3. INSTALL SOLAR PANELS ON RACKING SYSTEM.
4. SEED AREAS UNDER AND BETWEEN ROWS OF SOLAR PANELS WITH SPECIFIED SEED MIXTURE.
5. EROSION CONTROL MEASURES TO REMAIN IN PLACE UNTIL PERMANENT VEGETATIVE COVER HAS BEEN ESTABLISHED OVER THE DISTURBED AREA.
6. 6" FILTREXX SOXX & WOOD CHIP BERM REMAIN IN PLACE TO SLOW RUNOFF DOWN UNTIL VEGETATION GROWS UP.

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LOW IMPACT SUSTAINABLE DEVELOPMENT
TRINKAUS ENGINEERING

PHASING PLAN -PHASE III A & B
SHEET 11 OF 13
PROJECT #032-2019
SCALE: 1" = 80'
DATE: 3/6/2020, Rev. 5/1/20

PREPARED FOR
LODESTAR ENERGY
PLATT HILL ROAD
WINCHESTER - CONNECTICUT

True North

PREPARED FOR
LODESTAR ENERGY
PLATT HILL ROAD
WINCHESTER - CONNECTICUT

EXISTING CONDITIONS MAP
SHEET 12 OF 13
PROJECT #032-2019
SCALE: 1" = 150'
DATE: 3/6/2020, Rev. 5/1/20

LOW IMPACT SUSTAINABLE DEVELOPMENT
TRINKAUS ENGINEERING

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PROPERTY LOCATION: PLATT HILL ROAD -WINCHESTER, CONNECTICUT

1.1 PROJECT DESCRIPTION:

The project proposes the creation of a solar array on a portion of the approved Trade Winds Farm subdivision on Platt Hill Road. The solar array and associated access, equipment, stormwater management facilities, and clearing for solar access will be located on 24.8 acres as shown. The solar array will be 8.0 in size. The remaining land containing 75 acres will be conveyed to the Winchester Land Trust to remain in its natural state for perpetuity. A 12' wide driveway from the east side of Platt Hill Road will provide access to the solar array. Two riprap swales, located to the east and west of the solar array will collect and convey runoff to a constructed wetland system proposed to the southeast of the solar array.

1.2 ESTIMATED DISTURBANCE AREA:

Approximately 8.7 acres will be disturbed for access, solar array and stormwater management. 5.36 acres of trees will be cut down outside the solar array, the stumps left in place and the area seeded with a wildflower see mixture for pollinator habitat.

1.3 EROSION CONTROL MEASURES:

12" high Filtrexx Soxx, siltation fence barriers, anti-tracking pad will be used on this site.
A Construction entrance will be installed at the driveway entrance off Platt Hill Road.

1.4 CONSTRUCTION PHASES:

This project will be done in four phase following the sequence specified below.

1.5 CONSTRUCTION START DATES:

Construction on the site will likely commence within 180 days after all requried local land use approvals have been obtained from the Connecticut Siting Council assuming weather conditions permit. It is anticipated that all work will be completed within 6 months from commencement date.

1.6 DESIGN INFORMATION:

Hydrologic computations and analyses are found in the Stormwater Management Report prepared by this office.

1.7 OTHER PERMITS:

The CT DEEP General Permit for Construction Activities must be obtained by the applicant.

1.8 CONSERVATION PRACTICES:

Use of riprap swales, constructed wetland w/forebay, use of native seed mixtures for stabilization and habitat improvement.

1.9 DOCUMENT LIST:

1. Project Plan Set comprised of Sheet 1 thru 13 of 13

2.1 HYDROLOGIC CALCULATIONS:

Stormwater Management Report

2.2 SOIL TEST RESULTS:

Included in Stormwater Management Report

CONSTRUCTION SEQUENCE:

PHASE I

1. Field delineation of clearing limit for access driveway, stormwater conveyance and treatment systems, solar array and sun exposure area by a licensed land surveyor.
2. Temporary crossings of the two intermittent brooks shall be made using 4-6" diameter trees laid down parallel to the flow path of the intermittent streams to allow for the movement of tree skidders for the cutting and removal of trees.
3. Trees shall be cut down within the staked clearing limits. Whole trees shall be moved using timber skidders to a staging area just off Platt Hill Road. Timber quality logs shall be staked in a pile. All other woody material shall be chipped into a pile for used as a temporary stabilization material on disturbed area if vegetation cannot be established due to weather conditions.
4. No soil disturbance will take place during this phase.

PHASE II

1. Install 12" Filtrexx Soxx along the proposed access driveway, and below portions of the riprap swales and constructed wetland system as shown on the approved plans and in accord with the attached construction detail.
2. Remove stumps from area of access driveway, riprap swales and constructed wetland system. The removed stumps shall be placed temporarily at the edge of the anticipated driveway construction limits.
3. The entrance of the access driveway shall be rough graded and the 100' long construction entrance installated at the inter-section with Platt Hill Road.
4. Topsoil shall be removed from the portion of the driveway from Platt Hill Road to the first intermittent stream. Topsoil shall be placed in stockpile location as shown.
5. Subsoil shall be mechanically compacted by roller or other similar equipment. The base layer of 1-1/4" processed stone shall be placed and mechanically compacted.
6. The culvert and boulder headwalls shall be installed at the first intermittent stream crossing. After the stream crossing, topsoil shall be removed from the area of the driveway up to the second intermittent stream crossing and placed in the stockpile location.
7. The same process for the initial section of the driveway shall be repeated for the second intermittent stream crossing.
8. Topsoil shall be removed from the area of the driveway from the second intermittent stream crossing up to the "T" intersection, located just west of the solar array. Topsoil shall be placed in the stockpile location as the driveway constructed in the same manner as discussed above.
9. As the driveway construction reaches the area of the solar array, the previously removed stumps shall be moved to the staging area near Platt Hill Road for chipping into mulch or removal from the site.
10. The riprap swale along the eastern edge of the solar array shall be installed at this time and in accordance with the details and specifications shown on the plan. Soil removed to install the riprap swale shall be placed on the downhill side of the swale and graded to blend into the existing grade. Riprap consisting of modified riprap shall be placed in the swale per the approved plan.
11. Topsoil in the area of the southern portion of the driveway shall be removed and placed in a temporary stockpile location as shown.
12. The subsoil shall be mechanically complacted as noted above and then the base layer of 1-1/4" processed stone shall be placed & mechnically compacted.
13. The riprap swale located to the west of the driveway shall be installed in the same manner as the eastern swale was done. The regraded side slopes along the entire driveway shall be seeded, and covered with hay mulch. If it is not an ideal time to grow grass, then the disturbed areas shall be covered with a minimum of 4" of wood chips/mulch to reduce the impact of raindrops on the un-vegetated surface and prevent erosion of the earth slopes.
14. The constructed wetland, outlet structure and emergency spillway shall be installed in compliance with the approved plans. The earth berms in the bottom of the basin shall be installed. The bottom of the basin and side slopes shall be seeded with the specified seed mixture, and covered with hay mulch.
15. The area of trees cleared outside the limit of the array shall be seeded with the wildflower seed mixture specified for this area in order to establish pollinator habitat.

PHASE III - A:

1. Remove stumps from upper portion of solar array (Rows #1 to #10). Using Yoke Rake or similar equipment remove brush and other loose organic debris from ground surface.
2. Project land surveyor shall stake centerline of Row #5. 12" Filtrexx Soxx shall be installed just above Row #6 and Row #11 as shown on the plan and in accord with the attached detail.
3. Posts shall be installed for racking system for solar array in accordance with manufacturer's detail and specifications for Row #5.
4. After Row #5 has been installed, the rows uphill and downhill of Row #5 shall be installed providing the edge to edge offset of 15'.
5. After Rows #1 to #10 have been installed along with any electrical equipment, the ground surface shall be lightly scarified by York Rake or mini-excavator, if ground surface has been compacted. All disturbed areas within Phase IIIA of the solar array shall be seeded with New England Semi-Shade Grass and Forbs Mix by New England Wetland Plants.
6. The two rows of Filtrexx Soxx shall remain in place to prevent concentrated flow as the seed mixture becomes established.

PHASE III - B:

1. Remove stumps from lower portion of solar array (Rows #11 to #23). Using Yoke Rake or similar equipment remove brush and other loose organic debris from ground surface.
2. Project land surveyor shall stake centerline of Row #17. 12" Filtrexx Soxx shall be installed just above Row #17 and below Row #23 as shown on the plan and in accord with the attached detail.
3. Posts shall be installed for racking system for solar array in accordance with manufacturer's detail and specifications for Row #17.
4. After Row #17 has been installed, the rows uphill and downhill of Row #17 shall be installed providing the edge to edge offset of 15'.
5. After Rows #11 to #23 have been installed along with any electrical equipment, the ground surface shall be lightly scarified by York Rake or mini-excavator, if ground surface has been compacted. All disturbed areas within Phase IIIA of the solar array shall be seeded with New England Semi-Shade Grass and Forbs Mix by New England Wetland Plants.
6. The two rows of Filtrexx Soxx shall remain in place to prevent concentrated flow as the seed mixture becomes established.
7. The perimeter fence and gate shall be installed at this time and in accord with the submitted details.

PLAN OBJECTIVES AND PRINCIPALS:

The objectives of the Soil Erosion and Sediment Control Plan are to manage both the runoff and the earthwork operations by using Best Management Practices. The objectives are as follows:

a. Control erosion at its source with temporary control measures, minimize the runoff from areas of disturbance, distribute stormwater through natural vegetation before being discharged into wetland systems.

b. Keep land disturbance to a minimum. The site layout has been designed to minimize any potential impacts to wetlands.

c. Construct the project in phases to minimize the area of the site under active construction at one time.

d. Retain existing vegetation wherever feasible. Siltation fence or other barriers will be used to limit the extent of earthwork.

e. Stabilize disturbed areas as soon as practical. Earth disturbance shall not occur on a given area until active construction is to take place in this area.

f. Minimize the length and steepness of slopes.

g. Maintain low runoff velocities.

h. Trap sediment on site. Siltation fence barriers and driveway construction entrance will trap sediment during the construction period.

i. Establish a maintenance and repair program during the construction period. Erosion control measures will be inspected monthly during the active construction period and/or following rainfall events of greater than 0.5 inches and repaired as needed to ensure that they function properly.

j. Assign responsibility for the maintenance program. The responsibility for the maintenance program will be assigned to the contractor who shall designate one of its supervisory personnel to be the liason to the owner's representative. the owner shall retain the services of a licensed professional who shall inspect and monitor the contractor's methods and have the authority to require modifications to the Erosion and Sediment Control Plan. The town will be copied on all inspection reports prepared on behalf of the project.

TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES - MAINTENANCE REQUIREMENTS:

1. Siltation fence barriers: Accumulated sediment shall be removed when it has reached a height of 25% of the exposed sediment barrier and disposed off is an appropriate manner.

2. Filtrexx Soxx shall be inspected on a monthly basis. Accumulated sediment shall be removed from the uphill side of the Soxx when it is 50% of the height of the Soxx above grade.

CONTROL PLAN IMPLEMENTATION:

1. The contractor shall inspect the effectiveness and condition of erosion control devices during storm events, and after each rainfall event of 0.5" or more, prior to weekends and prior to forecasted large storm events.
2. The contractor shall repair or replace damaged erosion control measures immediately, and in case, more than four hours after observing such deficiencies.
3. The contractor shall be prepared to implement interm drainage controls and erosion control measures as may be necessary during the course of construction.
4. The constactor shall make available on-site all equipment, materials and labor necessary to effect emergency erosion control measures within four hours of any impending emergency situation.
5. The contractor shall make a final inspection, and clean up any tracked sediment on the existing road.
6. The contractor shall have on call at all times, a responsible representative who, when authorized, will mobilize the necessary personnel, materials and equipment and otherwise provide the required action when notified of any impending emergency situation.
7. The contractor shall supply a telephone number to the town engineer, planning agent so that the contractor may be contacted during the evenings and on weekends, if necessary.
8. The contractor shall maintain a minimum of 165 lf of Filtrexx 12" Soxx and 200 lf of silt fence on the site for emergencies.

GENERAL EROSION AND SEDIMENTATION CONTROL PLAN NOTES:

1. Regrading on this site shall done in such a manner as to prevent stagnant water from collecting in depresssions.
2. All erosion and sedimentation control measures will be installed prior to the start of any construction activity.
3. All erosion and sedimentation control measures shall be constructed in accordance with the submitted construction details and in compliance with the specifications and standards found in the "Guidelines for Soil Erosion and Sediment Control" as prepared by the State of Connecticut, revised to 2002.
4. Siltation fence barriers will be installed at the limit of all disturbed areas. Staked straw bales, will be utilized as necessary during the construction period. All work done shall be in accordance with the details shown on the plans.
5. Land disturbance will be kept to a minimum. Restabilization of all disturbed areas will occur as soon as final grading in complete.
6. All erosion and sedimentation control measures will be maintained in an effective conditions throughout the construction period.
7. Accumulated sediment will be removed from the control structures and disposed of in a lawful and safe manner.
8. Additional control measures will be installed during the construction period if the Zoning or Wetland Enforcement Officer requires them. The design engineer shall inspect the site periodically to ensure the proper installation of erosion control measures.
9. Regular inspections of the construction site shall be made by a representative of the Town of Glastonbury and a professional retained by the owner to assure compliance with the approved plans.
10. The responsibility for implementing the erosion and sedimentation control plan, informing all parties engaged on the construction site of the requirements and objectives of the plan, notifying the appropriate town agencies of any transfer of this responsibility and for conveying a copy of the erosion and sedimentation control plan if title to the land is transferred is placed upon the owner of record.

SEED MIXTURES

NEW ENGLAND SEMI-SHADE GRASS AND FORBS MIX:
Virginia Wildrye, Canada Wild Rye, Partridge Pea, Red Fescue, Spiked Grayfeather/Marsh Blazing Star, Sensitive Fern, Zigzag Aster, Hollow-Stem Joe Pye Weed, White Avens, Eastern Columbine, and Pat Rush.
Application Rate: 30 pounds per acre or 1 pound per 1,450 square feet

NEW ENGLAND WILDFLOWER MIX:
Little Bluestem, Red Fescue, Indian Grass, Partridge Pea, Canada Wild Rye, Blue Vervain, Butterfly Milkweed, Narrowleafed Blue Eyed Grass, Black Eyed Susan, New England Aster, Spiked Greyfeather/Marsh Blazing Star, Starved/Calico Aster, Early Goldenrod, and Hollow-Stem Joe Pye Weed.
Application Rate: 23 pounds per acre or 1 pound per 1,900 square feet.

NEW ENGLAND WETMIX:
Fox Sedge, Lurid Sedge, Blunt Broom Sedge, Blue Vervain, Fowl Bluegrass, Hop Sedge, Green Bulrush, Creeping Spike Rush, Fringed Sedge, Soft Rush, Spotted Joe Pye Weed, Rattlesnake Grass, Swamp Aster, Blueflag, Swamp Milkweed, and Square Stemmed Monkey Flower.
Application Rate: 18 pounds per acre or 1 pound per 2,500 square feet

NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES:
Riverbank Wild Rye, Creeping Red Fescue, Little Bluestem, Big Bluestem, Switch Grass, Upland Bentgrass, Nodding Bur Marigold, Hollow-Stemed Joe Pye Weed, New England Aster, Boneset, Blue Vervain, Soft Rush, and Wool Grass.
Application Rate: 35 pounds per acre or 1 pound per 1,250 square feet

SEEDING MIXTURES FOR AREAS TO BE MAINTAINED AS GRASS:

MIXTURE #1	
KENTUCKY BLUEGRASS	20 LBS/ACRE
CREEPING RED FESCUT	20 LBS/ACRE
PERENNIAL RYEGRASS	5 LBS/ACRE
MIXTURE #2	
CREEPING RED FESCUE	20 LBS/ACRE
REDTOP	2 LBS/ACRE
TALL FESCUE	20 LBS/ACRE

MAINTENANCE REQUIREMENTS FOR GRASS SWALES/CONSTRUCTED WETLAND BASIN:

GRASS SWALES AND CONSTRUCTED WETLAND BASIN SHALL BE INSPECTED ANNUALLY.

GRASS SWALES:
1. Perform visual inspection by walking the length of the grass swales,
2. Remove any woody debris which may have fallen or been blown in the swales by hand,
3. Visually inspect field stone check dams for their integrity, if stones have become loose, reset by hand
4. No mowing of the swales are necessary.

CONSTRUCTED WETLAND BASIN:
FOREBAY:
1. Perform visual inspection of forebay, use a large stick or piece of wood to measure the depth of any sediment in the forebay. If the depth of sediment is greater than 1/3 the depth, then the sediment shall be removed by mini-excavator,
2. Remove any woody debris which may have fallen or been blown in the forebay by hand,

CONSTRUCTED WETLAND BASIN:
1. Perform visual inspection of the bottom of the constructed wetland,
2. Remove any woody debris which may have fallen or been blown into the bottom of the basin,
3. Inspect the berm for the presence of any woody vegetation. If any woody vegetation is growing on the berm, it shall be cut at ground level and removed. If the woody vegetation is small enough, it shall be pulled out by hand and thrown into the upland area adjacent to the constructed wetland.
4. The outlet structure shall be inspected and any woody debris trapped on the trash rack shall be removed and disposed of in an upland area adjacent to the constructed wetland.

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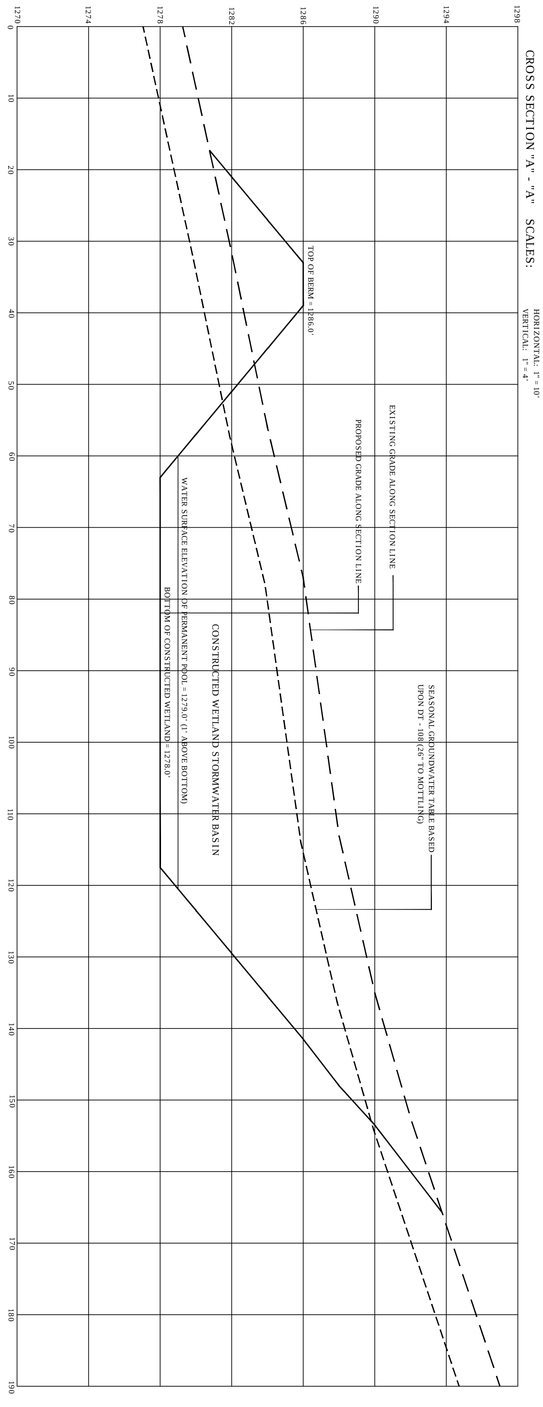
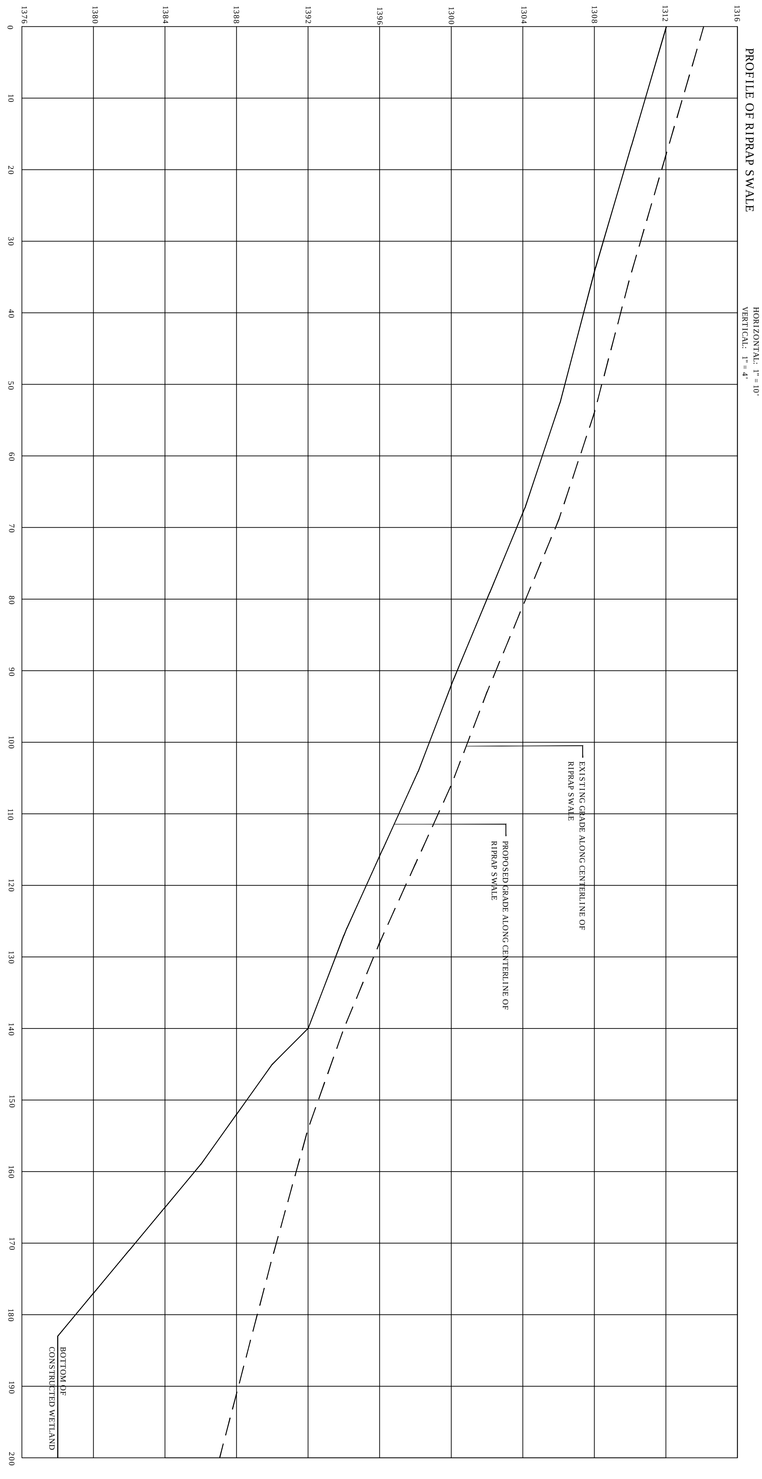
LOW IMPACT SUSTAINABLE DEVELOPMENT TRINKAUS ENGINEERING

CONSTRUCTION NARRATIVE
SHEET 13 OF 13
PROJECT #032-2019
SCALE: 1" = 150'
DATE: 3/6/2020, Rev. 5/1/20

PREPARED FOR
LODESTAR ENERGY
PLATT HILL ROAD
WINCHESTER - CONNECTICUT





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CROSS SECTIONS
SHEET 14 OF 15
PROJECT #032-2019
SCALES AS NOTED
DATE: 5/1/2020

LOW IMPACT SUSTAINABLE DEVELOPMENT
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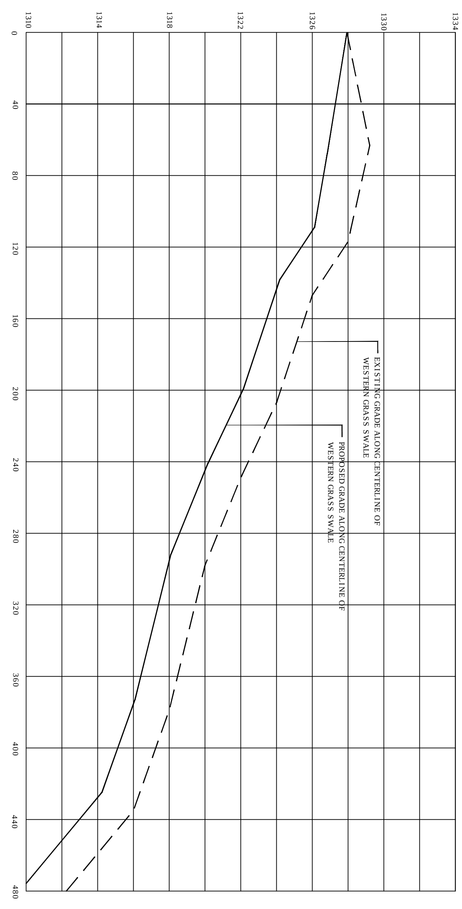

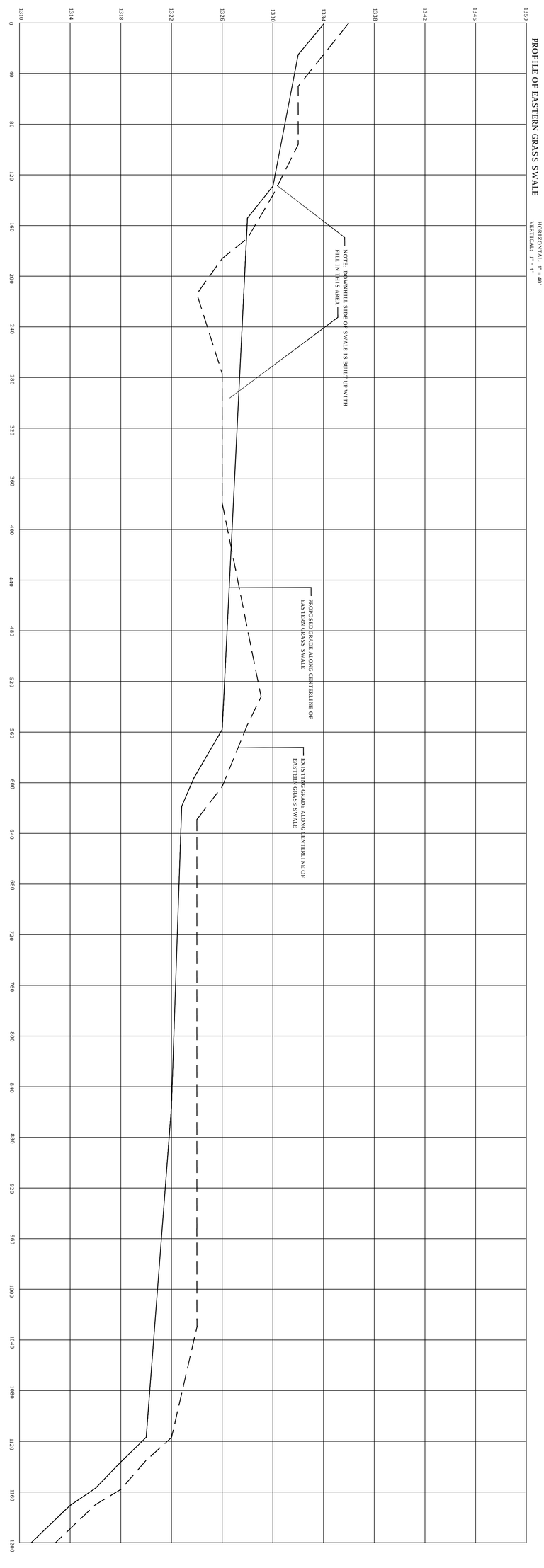

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CROSS SECTIONS
SHEET 15 OF 15
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SUPPORTING DOCUMENTATION
1.99 MW SOLAR ARRAY
PLATT HILL ROAD
WINCHESTER – CONNECTICUT
PREPARED FOR LODESTAR ENERGY
MARCH 20, 2020
Revised to May 1, 2020

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http://www.trinkausengineering.com

Property Description

The subject property is located on the east side of Platt Hill Road in Winchester, Connecticut, north of Taylor Brook Road and south of Dayton Road/Reaching Hill Road. The original site contained 104.5 acres and a 24-lot Conservation Subdivision was designed and approved on the 104.5 acre site back in 2005. The current owners are selling all the land except for three approved building lots which front on Platt Hill road. There an Eversource Easement containing utility poles located in the northeast corner of the site.

Vegetative Conditions

The majority of site is wooded. There are some former meadow areas found in the western portion of the site which are going through the Early Succession process to become a forested area. The dominant tree species on the site are a mixture of Black Oak, Red Oak, Sugar Maple, Red Maple, Black Cherry and American Beech. There are clusters of White Pines in the southern portion of the site. A selective timber harvest was conducted a portion of the property (area of proposed building lots) in 2006 and roughly 700 trees were removed. In these areas, herbaceous and shrub layers have become re-established on the forest floor.

Wetland/Watercourses

There are numerous wetland/watercourses systems on the subject property. The original wetland delineation was done in 2003 and confirmed in 2019. See document entitled "Wetlands Soil Evaluation" – 100 acres – Platt Hill Road – Winchester, Connecticut; dated: March 11, 2020 by this office for a detailed discussion of the wetland/watercourses on this site.

Wetland and watercourse systems are highlighted in Figure 1.

Environmental Evaluations

At the time of the subdivision application, two environmental assessments of the wetland/watercourse systems were performed by Matt Popp, Professional Wetland Scientist of Environmental Land Solutions and Penelope Sharp, Environmental Consultant.

A request was filed with the CT DEEP Natural Diversity Database in October 2019 and two species were identified: Bridle shiner (State Special Concern) and Eastern pondmussel (State Special Concern).

Matt Popp of Environmental Land Solutions has prepared a response to the CT DEEP Natural Diversity Database report. All of the environmental reports and the response from the CT DEEP Natural Diversity Database are found in the document entitled: "Environmental Evaluations" – 100 acres – Platt Hill Road – Winchester, Connecticut; dated: March 11, 2020.

Non-Wetland Soil Types

The upland soils on the site were field delineated by Mr. Beroz. They consist of Charlton, Paxton and Woodbridge. Additionally, deep test holes were excavated for the subdivision throughout the site to a depth of 7' to 8'. In the area of the solar array, Paxton soils are the dominant type. Only near Platt Hill Road was bedrock encountered at a depth less

than 7'. Test hole results are found in Appendix "C" of the Stormwater Management Report by Trinkaus Engineering, LLC.

The site is surrounded by residential development (lots of various sizes) and local roads which provide access to the residential properties and is not defined as core forest.

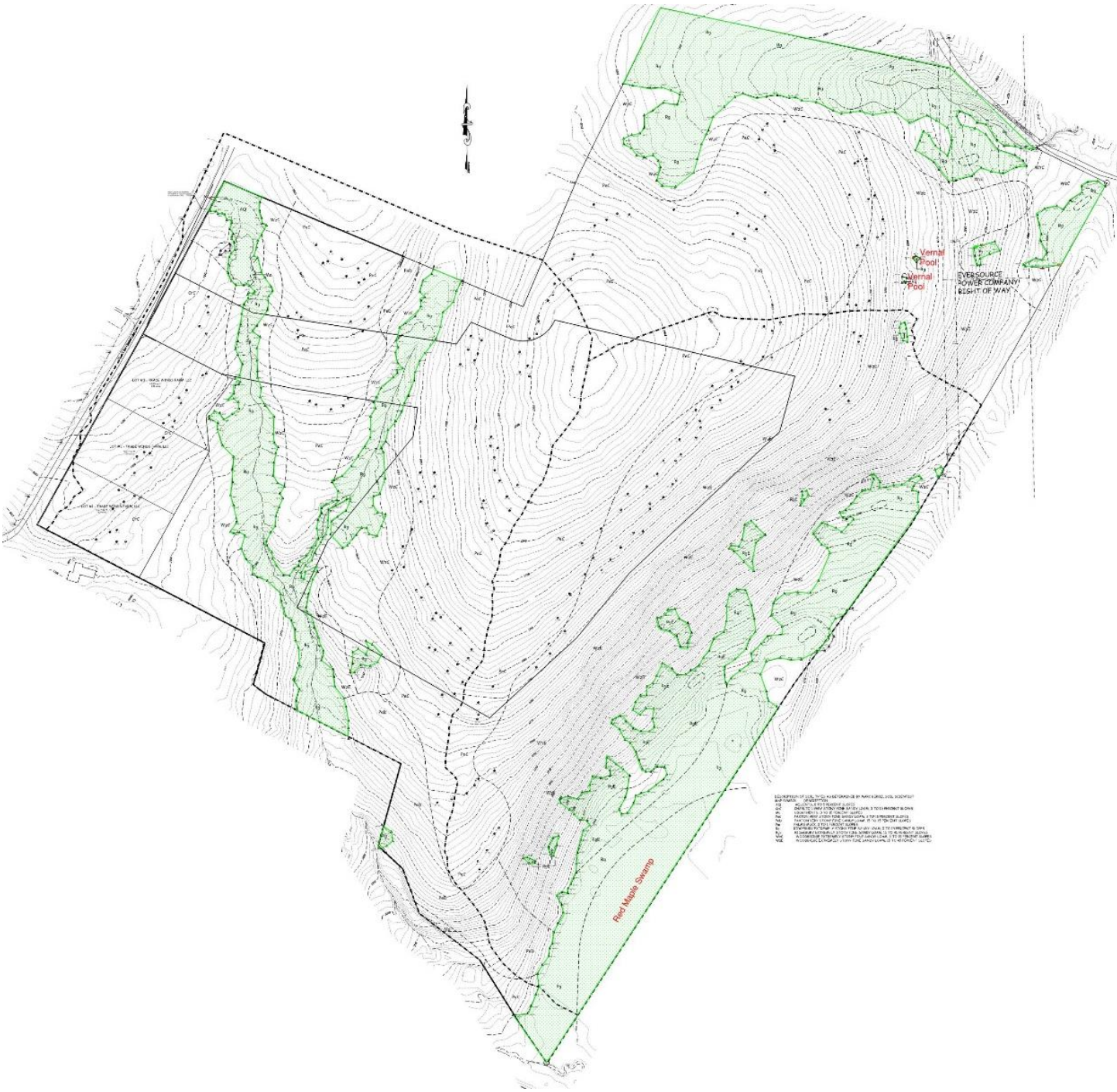

Figure 1 – Wetland/Watercourse/Vernal Pool Mapping

According to the Natural Resource Conservation Service Websoil survey, only two small portions of the subject property are considered Prime Farmland. The first area is located in the north central portion of the site which is outside the area of the proposed solar array. This portion of the site will be preserved as Open Space and conveyed to the Winchester Land Trust.

The second area is located in the northwest portion of the site between the two intermittent stream corridors. The proposed driveway crosses the southern edge of this area and there is no other development proposed on the farmland soils. The majority of the farmland soils in this area are located in the proposed open space area.

Mapping and description of the Prime Farmland Soils are found in Appendix "B" of this report.

Topographic Conditions

The topography of the site is variable. From Platt Hill Road, it slopes gently down in an easterly direction to the two intermittent watercourse/wetland corridors. There is an upland area in the northern area between the two intermittent watercourse/wetland corridor. From this wetland corridor the land slopes up to the east where there is a north/south ridge line. The high point of the site is located in the central portion of this area and from here the land slopes moderately to the north toward Dayton Road, it slopes to the east down moderate then steep slopes to the wetland system located along the bottom of the slope. The land slopes to the south on mild and moderate slopes in the general direction of Taylor Road. The topography of the site is clearly visible in Figure 1.

The subject property and adjacent residential properties and local roads are shown in Figure 2 which was taken from Town of Winchester GIS mapping.

Figure 2 – Town of Winchester GIS Mapping showing project site.

FEMA Mapping

Figure 3 shows the site (in red outline) on the FEMA mapping. There is no floodway, 100-year or 500-year flood plain within 0.5 mile of the site. There is no active farm land within 0.5 miles of the subject property. Platt Hill State Park Scenic Reserve is located 1,100 north of the subject property and 2,100 feet from the parcel containing the soil array. Other State of Connecticut land is located 1,500 feet to the east of the subject parcel.

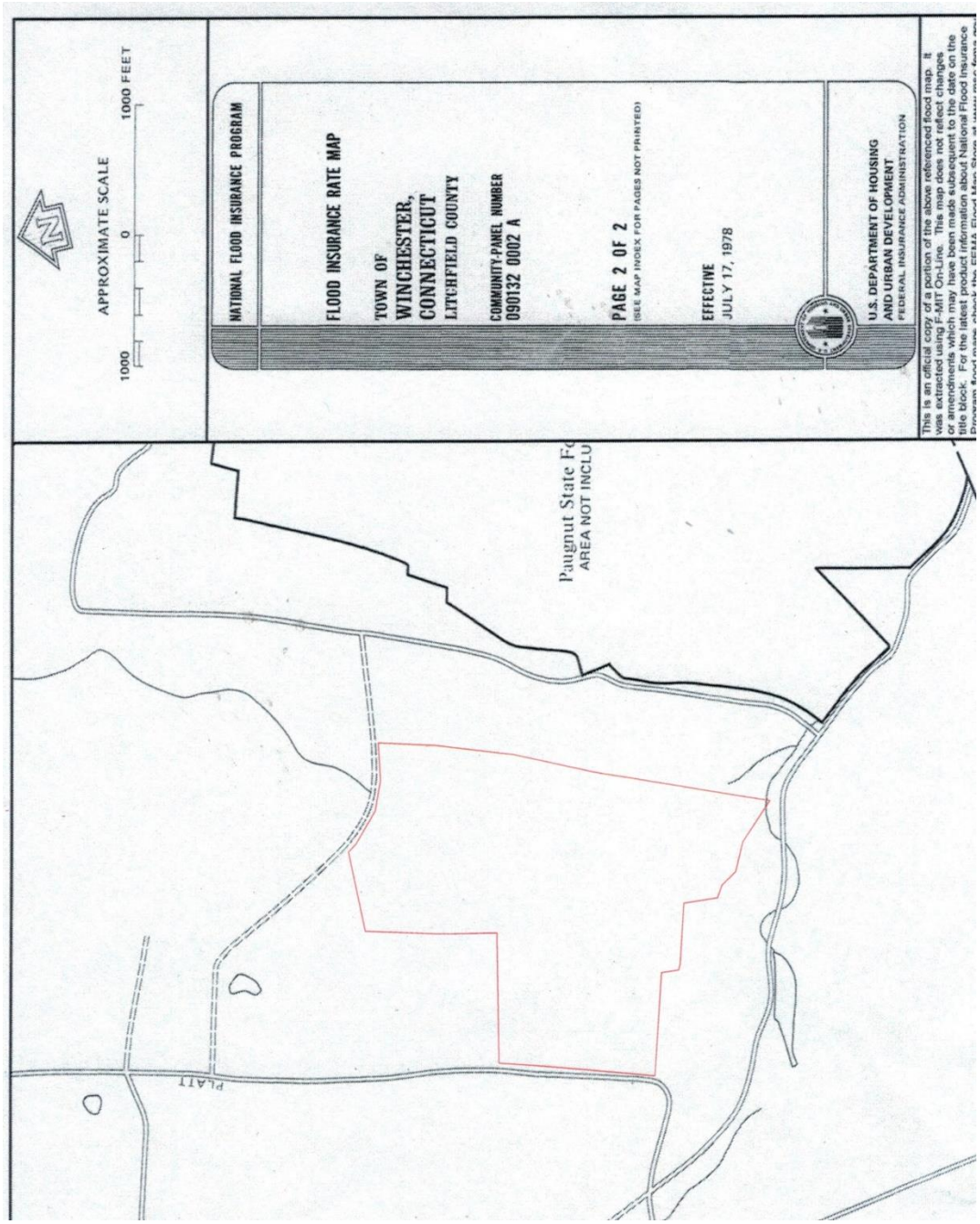

Figure 3 - FEMA Mapping

Aquifer Mapping

According to Town of Winchester mapping there are no primary or secondary recharge zones or aquifer protection areas on or within 0.5 miles of the subject property.

Project Description

The 100 acres will be divided into two parcels. One of 24.8 acres will contain the solar array, electrical equipment and access driveway from Platt Hill Road. The second parcel containing 75 acres will be deeded to the Winchester Land Trust to be preserved in perpetuity.

The solar array will be installed in the central portion of the site on the south facing slopes noted above. The area of the solar array is 8 acres, an additional 5.36 acres will be cleared for providing solar access for the panels. The array will consist of 7,908 panels on a steel racking system.

A twelve (12') wide gravel driveway will provide access from Platt Hill Road to the solar array. The driveway will cross the two intermittent stream/wetland corridors found in the western portion of the site. Each intermittent stream will have a 15" HDPE pipe installed along the watercourse flow path to convey any flows safely under the driveway. Boulder headwalls will be used to minimize the extent of fill associated with the two crossings. Both crossings are in the same location as for the road for the subdivision which were reviewed and approved by the Winchester Inland Wetlands Commission. Once the driveway reaches the area of the array it will turn to the south and run along the west side of the array to the southern end of the array to provide access.

The proposed solar array will be located more than 100' from the delineated wetlands located to the west of the array. The array is located more than 200' to the closest wetland area found to the east of the array. The northeast corner of the solar array is located a minimum of 540' from the closest vernal pool. The discharge from the constructed wetland system designed to handle runoff from the solar array will be directed to the western wetland area. The area of the solar array relative to the property boundaries is shown in Figure 4 below.

The solar panels will be installed at a 25-degree angle to maximize the solar exposure. The panel rows will be separated by 15'. The array will be enclosed by a 7.5' high fence as shown on the site plans prepared by Trinkaus Engineering, LLC. The bottom edge of the fence will be 8" above the ground surface to permit the movement of small animals.

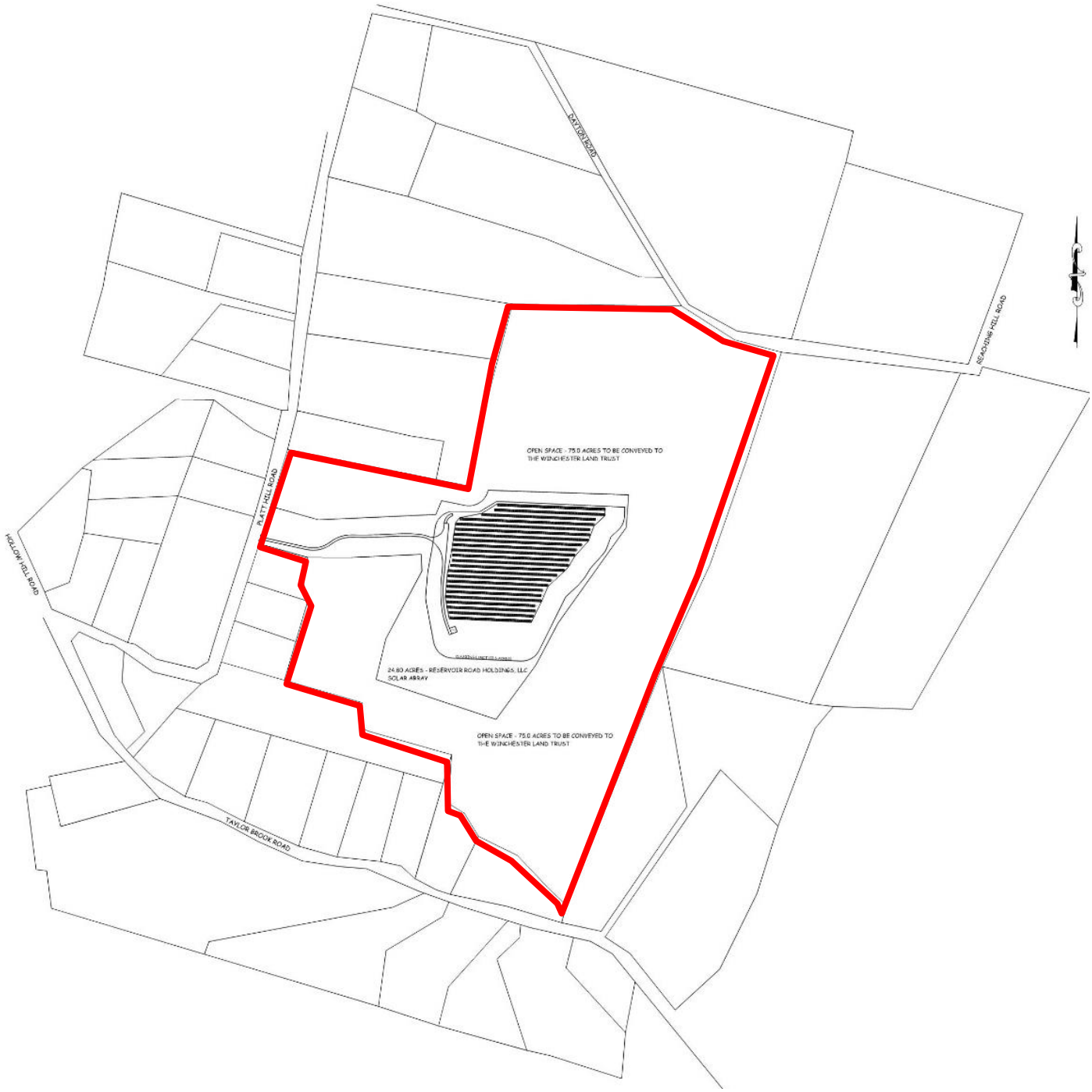

Figure 4 – Location of Solar Array on Subject Property (Town of Winchester GIS Mapping)

Summary of Stormwater Management

Stormwater from the proposed impervious surfaces in two ways. The proposed driveway from Platt Hill Road will have a 2.5% cross slope as shown on the plans to allow runoff from the gravel surface to travel as overland flow into the densely vegetated areas on either side of the driveway. Runoff will naturally infiltrate into the un-disturbed soils in these areas.

Runoff from the area of the solar array will occur as overland flow across the slightly disturbed ground surface and will enter swales on the east and west sides of the array. The swales will convey the runoff with non-erosive velocities (< 3 fps) to a Constructed Wetland System, located to the southeast of the array. An outlet control structure will restrict outflows to the downgradient wetland system. More detailed information and computations are provided in the Stormwater Management Report which follows. Figure 5 shows an overview of the stormwater management system.

Impacts to Wetland/Watercourses

The driveway to the solar array must cross two intermittent stream/wetland corridors. Both crossings are unavoidable, but the impact to the wetland has been minimized. Crossing #1 will impact 775 square feet of wetlands with 83 cubic yards of fill material. Crossing #2 will impact 842 square feet of wetlands with 106 cubic yards of fill material. The outlet from the Constructed Wetland System and the emergency spillway will both discharge to the edge of the wetland boundary. There is no direct wetland impact associated with the Constructed Wetland System.

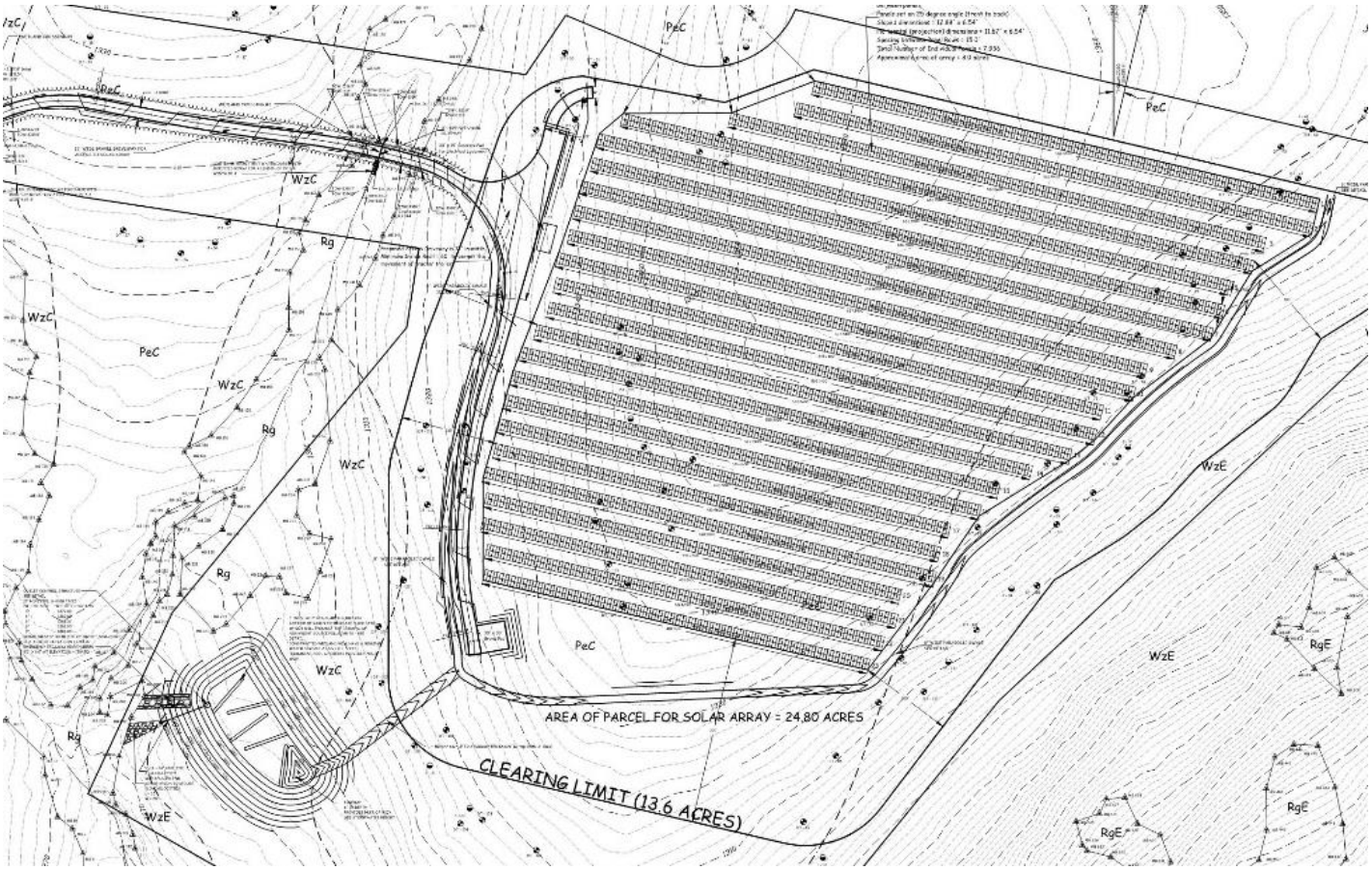

Figure 5 – Overview of Stormwater Management system

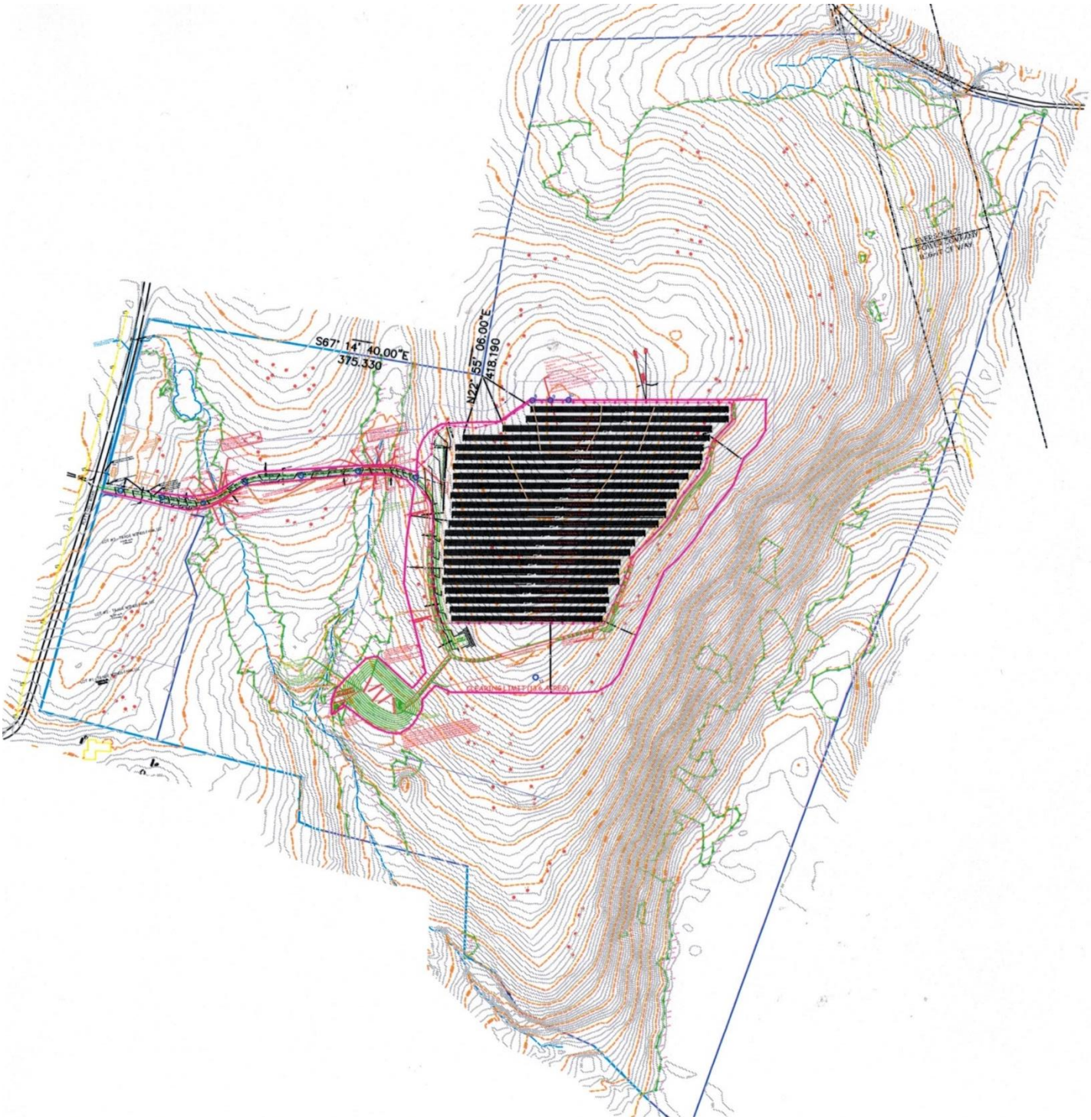

Figure 6 - Existing topographic map with solar array

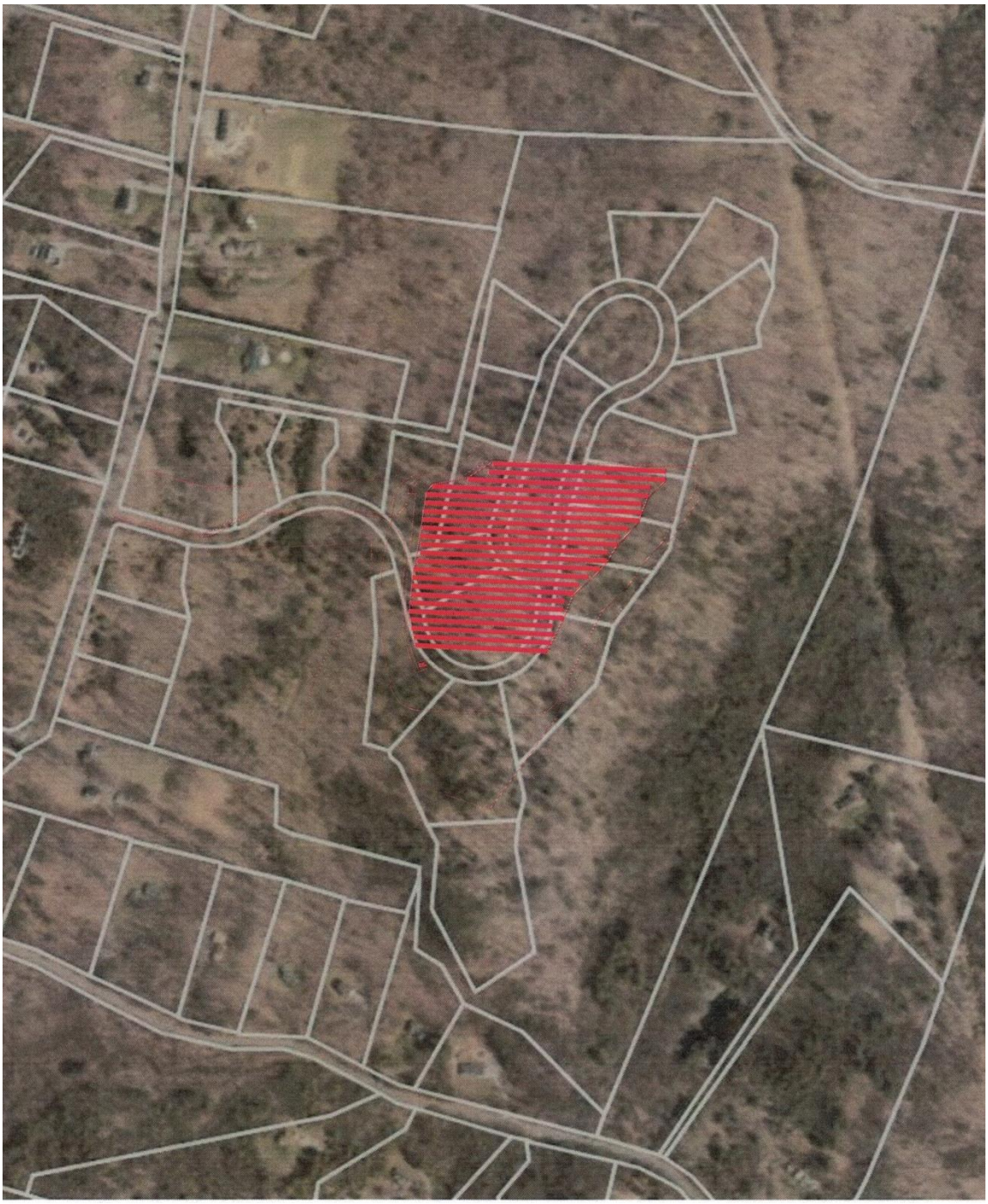

Figure 7 - Solar Array on Winchester GIS Mapping

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Stormwater Management Report – Lodestar Energy – Platt Hill Road – Winchester, Connecticut

Date: March 20, 2020

Existing Conditions

The site of the proposed solar array is located on the former Trade Winds Farm Subdivision, which contained 24 lots developed under the Open Space regulations of the Town of Winchester. Trade Winds Farm, LLC is maintaining ownership of the three approved lots which front on Platt Hill Road. The remaining portion of the site is being sold to Mayland Energy, LLC which will then lease a portion of the site to Lodestar Energy for the solar array.

The site consists of overgrown meadow, brush area mostly located in the western portion of the site. The balance of the site is wooded with a mixture of northern hardwood species and a small concentration of white pines in the southeastern portion of the site.

Proposed Conditions

A parcel containing 24.8 acres for the solar array is being created with the required minimum lot width onto Platt Hill Road. An open space parcel of 75.0 acres will surround the solar array and will be given to the Winchester Land Trust for preservation in perpetuity.

The solar array will be in the south-central portion of the site. A gravel driveway, 12' in width will provide access to the array from Platt Hill Road. The driveway will cross two small intermittent streams, found in the western portion of the site in the same locations as the road for the subdivision was approved. The initial 900'+ of the driveway will have a 2.5% cross slope to allow runoff from the gravel driveway to sheet off as overland flow into the adjacent upland areas where it will infiltrate into the undisturbed soils.

A "T" intersection is proposed just to the west of the solar array to allow for the turning movements of trailer trucks which will deliver the photovoltaic panels and support systems for installation. The driveway will then go south to a smaller parking area of approximately 900 square feet (gravel surface).

The proposed solar array, consisting of 23 rows of panels, containing 7,936 panels is located on the west and east sides of the central ridgeline/slope on slopes less than 15.0%. There is a 15' spacing between the panel rows. The area of the solar array is 8.0 acres. The cleared areas to the west, east and south of the actual array is 5.6 acres.

Stumps will be removed from the area of the actual array. The areas under and between the solar panels will be seeded with "New England Semi-Shade Grass and Forbs Mix" from New England Wetland Plants (www.newp.com/catalog/seed-mixes/#erosionDry) . This seed mix is a low mow and maintenance species. The stumps will remain in the cleared areas.

The ground within the cleared areas outside the area of the array will be seeded with "New England Wildflower Mix" by New England Wetland Plants ((www.newp.com/catalog/seed-mixes/#erosionDry) to provide a food source for pollinator species. Both seed mixtures are provided on the project plan set.

The soil types as determined by Mr. Beroz in the area of the solar array are Paxton, which are Hydrologic Soil Class C in TR-55. As part of the subdivision, 150 deep test holes were done to determine the suitability for on-site sewage disposal systems. Many of these test holes are in the area of the solar array and are approximately 7' in depth. The results of the test holes in and near the proposed solar array are shown in Appendix "A" of this report

Stormwater Management

The design of the stormwater management collection, treatment and detention system fully complies with the requirements found in Appendix "I" of the Connecticut General Permit by the CT DEEP. First, the solar panels are considered impervious (RCN of 98), the gravel driveway is also considered impervious with a slightly lower RCN as the top 4" layer of gravel will be washed (RCN of 96) and thus porous, while the 8" base of the driveway will be compacted processed stone.

The ground cover under and between the rows of panels were considered as Meadow, Fair Condition on Class D soils (required by Appendix "I" by CT DEEP) as there will be some disturbance of the soil surface (removal of stumps, debris) even though no other grading of these soils being proposed for this solar array. The Fair condition was used to be conservative as it takes two full years for the vegetation to become fully established and thus initially after the installation of the array, the rate and volume of runoff will be higher.

Runoff from the area of the solar array will drain as overland flow in three directions. Runoff from that portion of the array located on either side of the ridge line will drain perpendicular to the panel rows to the south.

Other runoff will follow the natural contours to the east or west to the perimeter of the array. A parabolic swale lined with modified riprap is located just beyond the limit of the panel rows on the east side. This swale will collect any runoff which does not infiltrate in the vegetated areas between the rows which is following the natural contours. The swale will convey the runoff to the constructed wetland system, located to the southwest of the array.

Runoff from the western portion of the array will drain as overland flow following the contours toward the gravel driveway. Any runoff which does not infiltrate will drain across the gravel driveway and then to a parabolic swale lined with modified riprap and will be conveyed to the constructed wetland system.

The parabolic riprap swales will reduce flow velocities while safely conveying the peak rate of runoff generated by the 10-year rainfall event as required by the CT DEP 2004 Storm Water Quality Manual "2004 Manual". Computations are provided later in this report.

Stormwater Treatment/Detention

Near the southwest corner of the array, the east and west swale join up and a slightly larger parabolic swale will convey the runoff to the constructed wetland system. The constructed wetland system has a 6' deep forebay providing 14.9% of the calculated Water Quality Volume (WQV) per the 2004 Manual. The forebay, located in the northeast corner of the system will trap any sediment which is not trapped within the east and west riprap swales.

The outlet structure is in the southwest corner of the system. In order to provide a higher level of treatment of the runoff, a series of 3' wide by 8" high earth berms will be installed in the bottom of the system to increase the flow path from inlet to outlet.

Appendix "I" requires that a zero increase in the peak rate of runoff is achieved for all design storms. Literature and other solar arrays in Connecticut have shown that runoff volumes are significantly increased over pre-development conditions. These increased runoff volumes when discharged to receiving streams have caused erosion of the native channel and downstream sedimentation of the eroded material. To address the increased runoff volumes, the outlet structure of the constructed wetland has been designed to provide the Channel Protection Volume (CPV) found in the 2004 Manual. The CPV requires the reduction of the post-development peak rate for the 2-year storm to be reduced to 50% of the pre-development peak rate for the 2-year storm.

The lowest orifice will be set 1' above the bottom of the system to provide a permanent pool of water containing 63% of the WQV. When combined with the fixed storage volume in the forebay, a total of 77.9% of the WQV is provided in the permanent pool. The bottom of the basin and berms will be seeded with New England Wetmix by New England Wetland Plants (www.newp.com/catalog/seed-mixes/#erosionDry). The side slopes of the basin shall be seeded with New England Erosion Control/Restoration Mix for Detention Basins and Moist sites by New England Wetland Plants(www.newp.com/catalog/seed-mixes/#erosionDry) .

The design of the constructed wetland will provide the following aspects:

a. Reduction of non-point source pollutants loads by having a permanent pool, vegetated bottom and long flow paths,
b. The Channel Protection Volume is provided in the system, reducing the post-development peak rate to 4.28 cfs which is only 45.6% of the pre-development peak rate for the 2-year rainfall event. Thus, the CPV will be met by this design. This is shown as bold in Table 3 below.
c. Zero increase in the peak rate of runoff is provided for the 1-year, 2-year, 5-year, and 10-year rainfall events. There is an increase of 0.03 cfs for the WQ storm, however, this is effectively 0 because of the inherent limitations found in TR-55. There is a 1.06 cfs increase for the 25-year storm, 0.84 cfs increase for the 50-year storm, and 0.62 cfs increase for the 100-year storm. These negligible calculated increases are well with the tolerances for the TR-55 Methodology. It is important to understand that 90% of the annual rainfall events are less than 1" of rainfall in 24 hours and that 98% of the annual rainfall events are less than 3.48" of rainfall in 24 hours (2-year storm) when long term rainfall events are evaluated. It is most important from a peak rate and runoff volume perspective to focus on those storms equal to or less than the 2-year event to prevent adverse environmental impacts to receiving streams.

Table 1 shows the changes in peak rates of runoff from the solar array

Storm Event	Pre-development	Post-development	Net Change
WQ storm	0.03 cfs	0.73 cfs	+0.70 cfs
1-year	5.30 cfs	12.89 cfs	+7.59 cfs
2-year	9.38 cfs	19.59 cfs	+10.21 cfs
5-year	17.00 cfs	31.16 cfs	+14.16 cfs
10-year	23.92 cfs	41.10 cfs	+17.18 cfs
25-year	33.90 cfs	54.91 cfs	+21.01 cfs
50-year	41.28 cfs	64.87 cfs	+23.59 cfs
100-year	49.72 cfs	76.11 cfs	+26.39 cfs

Table 2 shows the changes in runoff volumes from the solar array

Storm Event	Pre-development	Post-development	Net Change
WQ storm	0.019 acre-feet	0.129 acre-feet	+0.11 acre-feet
1-year	0.790 acre-feet	1.333 acre-feet	+0.543 acre-feet
2-year	1.313 acre-feet	1.999 acre-feet	+0.686 acre-feet
5-year	2.300 acre-feet	3.175 acre-feet	+0.875 acre-feet
10-year	3.205 acre-feet	4.205 acre-feet	+1.000 acre-feet
25-year	4.528 acre-feet	5.665 acre-feet	+1.137 acre-feet
50-year	5.519 acre-feet	6.736 acre-feet	+1.217 acre-feet
100-year	6.666 acre-feet	7.959 acre-feet	+1.293 acre-feet

Table 3 shows the reductions of peak rates of runoff from Constructed Wetlands

Storm Event	Pre-development	Post to CW	CW Discharge	Net Change
WQ storm	0.03 cfs	2.28 cfs	0.06 cfs	+0.03 cfs
1-year	5.30 cfs	14.56 cfs	2.26 cfs	-3.04 cfs
2-year	**9.38 cfs**	**20.29 cfs**	**4.28 cfs**	**-5.10 cfs**
5-year	17.00 cfs	29.72 cfs	8.13 cfs	-8.87 cfs
10-year	23.92 cfs	37.60 cfs	17.59 cfs	-8.39 cfs
25-year	33.90 cfs	48.36 cfs	34.96 cfs	+1.06 cfs
50-year	41.28 cfs	56.06 cfs	42.12 cfs	+0.84 cfs
100-year	49.72 cfs	64.69 cfs	50.34 cfs	+0.62 cfs

WATER QUALITY VOLUME CALCULATION:
WQV = (1")(Rv)(A)/12, WHERE Rv = 0.05 + 0.009 (I)
A = 7.9714 acres
I = 3.4762 acres (43.6%)
Rv = 0.05 + 0.009 (43.6) = 0.4424
WQV = (1)(0.4424)(7.9714)/12 = 0.2939 acre-feet = 12,801 cubic feet

GROUNDWATER RECHARGE VOLUME CALCULATION:
GRV = (D)(A)(I)/12
A = 7.9714 acres
I = 3.4762 acres (0.436)
D = 0.10 (Class C soils)
GRV = (0.10)(7.9714)(0.436)/12 = 0.0290 acre-feet = 1,262 cubic feet

SIZING OF OUTLET PROTECTION FOR DISCHARGE PIPE FROM CONSTRUCTED WETLANDS:
Q = 25.53 cfs
D = 24" HDPE
TW = 0.89'
La = 1.7 $(Q)/(D)^{3/2}$ + 8(D) = 1.7(34.96)/$(2)^{3/2}$ + 8(2) = 37.0',
Width at Apron End = 3(D) + 0.4 (La) = 3(2) + 0.4(37) = 20.8', USE W = 21.0'

CAPACITY CALCULATION OF PARABOLIC GRASS AND RIPRAP SWALES:
BOTH SWALES HAVE A TOP WIDTH = 8.0' AND A CENTERLINE DEPTH OF 2.0'

AVERAGE SLOPE - WEST SWALE = 3.06%, Q = 18.18 CFS
Depth of flow = 0.88', Flow velocity = 8.70 fps, Percent full = 44%

AVERAGE SLOPE – EAST SWALE = 2.50%, Q = 19.42 CFS
Depth of flow = 0.92', Flow velocity = 8.86 fps, Percent full = 45%

AVERAGE SLOPE – RIPRAP SWALE = 14%, Q = 37.60 CFS
Depth of flow = 0.72', Flow velocity = 10.35 fps, Percent full = 36%

SOLAR ARRAY – PRE-DEVELOPMENT
WQ STORM

Summary for Subcatchment 3S: Solar Array Area - PRE

Runoff = 0.03 cfs @ 15.55 hrs, Volume= 0.019 af, Depth> 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Storm Rainfall=1.00"

Area (sf)	CN	Description
593,934	73	Woods, Fair, HSG C
593,934		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.48"
6.5	483	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.5	631	0.0790	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.6	1,214	Total			

1-YEAR STORM

Summary for Subcatchment 3S: Solar Array Area - PRE

Runoff = 5.30 cfs @ 12.55 hrs, Volume= 0.790 af, Depth> 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-year Rainfall=2.74"

Area (sf)	CN	Description
593,934	73	Woods, Fair, HSG C
593,934		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.48"
6.5	483	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.5	631	0.0790	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.6	1,214	Total			

2-YEAR STORM

Summary for Subcatchment 3S: Solar Array Area - PRE

Runoff = 9.38 cfs @ 12.52 hrs, Volume= 1.313 af, Depth> 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.48"

Area (sf)	CN	Description
593,934	73	Woods, Fair, HSG C
593,934		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.48"
6.5	483	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.5	631	0.0790	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.6	1,214	Total			

5-YEAR STORM

Summary for Subcatchment 3S: Solar Array Area - PRE

Runoff = 17.00 cfs @ 12.50 hrs, Volume= 2.300 af, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-year Rainfall=4.69"

Area (sf)	CN	Description
593,934	73	Woods, Fair, HSG C
593,934		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.48"
6.5	483	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.5	631	0.0790	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.6	1,214	Total			

10-YEAR STORM

Summary for Subcatchment 3S: Solar Array Area - PRE

Runoff = 23.92 cfs @ 12.49 hrs, Volume= 3.205 af, Depth> 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.70"

Area (sf)	CN	Description
593,934	73	Woods, Fair, HSG C
593,934		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.48"
6.5	483	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.5	631	0.0790	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.6	1,214	Total			

25-YEAR STORM

Summary for Subcatchment 3S: Solar Array Area - PRE

Runoff = 33.90 cfs @ 12.48 hrs, Volume= 4.528 af, Depth> 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.09"

Area (sf)	CN	Description
593,934	73	Woods, Fair, HSG C
593,934		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.48"
6.5	483	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.5	631	0.0790	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.6	1,214	Total			

50-YEAR STORM

Summary for Subcatchment 3S: Solar Array Area - PRE

Runoff = 41.28 cfs @ 12.48 hrs, Volume= 5.519 af, Depth> 4.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.09"

Area (sf)	CN	Description
593,934	73	Woods, Fair, HSG C
593,934		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.48"
6.5	483	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.5	631	0.0790	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.6	1,214	Total			

100-YEAR STORM

Summary for Subcatchment 3S: Solar Array Area - PRE

Runoff = 49.72 cfs @ 12.48 hrs, Volume= 6.666 af, Depth> 5.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=9.22"

Area (sf)	CN	Description
593,934	73	Woods, Fair, HSG C
593,934		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.48"
6.5	483	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.5	631	0.0790	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.6	1,214	Total			

SOLAR ARRAY – POST-DEVELOPMENT
WQ STORM

Summary for Subcatchment 4S: Solar Array Area - POST

Runoff = 0.73 cfs @ 12.43 hrs, Volume= 0.129 af, Depth> 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Storm Rainfall=1.00"

	Area (sf)	CN	Adj	Description
	10,000	96		Gravel surface, HSG D
	151,423	98		Unconnected pavement, HSG D
*	261,537	84		Meadow in array area, Fair, HSG D
	170,974	71		Meadow, non-grazed, HSG C
	593,934	84	82	Weighted Average, UI Adjusted
	442,511			74.51% Pervious Area
	151,423			25.49% Impervious Area
	151,423			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.4	1,214	Total			

1-YEAR STORM

Summary for Subcatchment 4S: Solar Array Area - POST

Runoff = 12.89 cfs @ 12.26 hrs, Volume= 1.333 af, Depth> 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-year Rainfall=2.74"

	Area (sf)	CN	Adj	Description
	10,000	96		Gravel surface, HSG D
	151,423	98		Unconnected pavement, HSG D
*	261,537	84		Meadow in array area, Fair, HSG D
	170,974	71		Meadow, non-grazed, HSG C
	593,934	84	82	Weighted Average, UI Adjusted
	442,511			74.51% Pervious Area
	151,423			25.49% Impervious Area
	151,423			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.4	1,214	Total			

2-YEAR STORM

Summary for Subcatchment 4S: Solar Array Area - POST

Runoff = 19.59 cfs @ 12.26 hrs, Volume= 1.999 af, Depth> 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.48"

	Area (sf)	CN	Adj	Description
	10,000	96		Gravel surface, HSG D
	151,423	98		Unconnected pavement, HSG D
*	261,537	84		Meadow in array area, Fair, HSG D
	170,974	71		Meadow, non-grazed, HSG C
	593,934	84	82	Weighted Average, UI Adjusted
	442,511			74.51% Pervious Area
	151,423			25.49% Impervious Area
	151,423			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.4	1,214	Total			

5-YEAR STORM

Summary for Subcatchment 4S: Solar Array Area - POST

Runoff = 31.16 cfs @ 12.25 hrs, Volume= 3.175 af, Depth> 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-year Rainfall=4.69"

	Area (sf)	CN	Adj	Description
	10,000	96		Gravel surface, HSG D
	151,423	98		Unconnected pavement, HSG D
*	261,537	84		Meadow in array area, Fair, HSG D
	170,974	71		Meadow, non-grazed, HSG C
	593,934	84	82	Weighted Average, UI Adjusted
	442,511			74.51% Pervious Area
	151,423			25.49% Impervious Area
	151,423			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.4	1,214	Total			

10-YEAR STORM

Summary for Subcatchment 4S: Solar Array Area - POST

Runoff = 41.10 cfs @ 12.25 hrs, Volume= 4.205 af, Depth> 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.70"

	Area (sf)	CN	Adj	Description
	10,000	96		Gravel surface, HSG D
	151,423	98		Unconnected pavement, HSG D
*	261,537	84		Meadow in array area, Fair, HSG D
	170,974	71		Meadow, non-grazed, HSG C
	593,934	84	82	Weighted Average, UI Adjusted
	442,511			74.51% Pervious Area
	151,423			25.49% Impervious Area
	151,423			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.4	1,214	Total			

25-YEAR STORM

Summary for Subcatchment 4S: Solar Array Area - POST

Runoff = 54.91 cfs @ 12.25 hrs, Volume= 5.665 af, Depth> 4.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.09"

	Area (sf)	CN	Adj	Description
	10,000	96		Gravel surface, HSG D
	151,423	98		Unconnected pavement, HSG D
*	261,537	84		Meadow in array area, Fair, HSG D
	170,974	71		Meadow, non-grazed, HSG C
	593,934	84	82	Weighted Average, UI Adjusted
	442,511			74.51% Pervious Area
	151,423			25.49% Impervious Area
	151,423			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.4	1,214	Total			

50-YEAR STORM

Summary for Subcatchment 4S: Solar Array Area - POST

Runoff = 64.87 cfs @ 12.25 hrs, Volume= 6.736 af, Depth> 5.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.09"

	Area (sf)	CN	Adj	Description
	10,000	96		Gravel surface, HSG D
	151,423	98		Unconnected pavement, HSG D
*	261,537	84		Meadow in array area, Fair, HSG D
	170,974	71		Meadow, non-grazed, HSG C
	593,934	84	82	Weighted Average, UI Adjusted
	442,511			74.51% Pervious Area
	151,423			25.49% Impervious Area
	151,423			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.4	1,214	Total			

100-YEAR STORM

Summary for Subcatchment 4S: Solar Array Area - POST

Runoff = 76.11 cfs @ 12.25 hrs, Volume= 7.959 af, Depth> 7.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=9.22"

	Area (sf)	CN	Adj	Description
	10,000	96		Gravel surface, HSG D
	151,423	98		Unconnected pavement, HSG D
*	261,537	84		Meadow in array area, Fair, HSG D
	170,974	71		Meadow, non-grazed, HSG C
	593,934	84	82	Weighted Average, UI Adjusted
	442,511			74.51% Pervious Area
	151,423			25.49% Impervious Area
	151,423			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.4	1,214	Total			

SOLAR ARRAY WEST SWALE
WQ STORM

Summary for Subcatchment 7S: Solar Array - West Swale

Runoff = 1.10 cfs @ 12.22 hrs, Volume= 0.111 af, Depth> 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Storm Rainfall=1.00"

	Area (sf)	CN	Description
	9,000	96	Gravel surface, HSG D
	66,349	98	Unconnected pavement, HSG D
*	128,627	84	Meadow in array area, Fair, HSG D
	203,976	89	Weighted Average
	137,627		67.47% Pervious Area
	66,349		32.53% Impervious Area
	66,349		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

1-YEAR STORM

Summary for Subcatchment 7S: Solar Array - West Swale

Runoff = 7.04 cfs @ 12.20 hrs, Volume= 0.649 af, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-year Rainfall=2.74"

	Area (sf)	CN	Description
	9,000	96	Gravel surface, HSG D
	66,349	98	Unconnected pavement, HSG D
*	128,627	84	Meadow in array area, Fair, HSG D
	203,976	89	Weighted Average
	137,627		67.47% Pervious Area
	66,349		32.53% Impervious Area
	66,349		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

2-YEAR STORM

Summary for Subcatchment 7S: Solar Array - West Swale

Runoff = 9.81 cfs @ 12.19 hrs, Volume= 0.911 af, Depth> 2.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.48"

	Area (sf)	CN	Description
	9,000	96	Gravel surface, HSG D
	66,349	98	Unconnected pavement, HSG D
*	128,627	84	Meadow in array area, Fair, HSG D
	203,976	89	Weighted Average
	137,627		67.47% Pervious Area
	66,349		32.53% Impervious Area
	66,349		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

5-YEAR STORM

Summary for Subcatchment 7S: Solar Array - West Swale

Runoff = 14.37 cfs @ 12.19 hrs, Volume= 1.353 af, Depth> 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-year Rainfall=4.69"

	Area (sf)	CN	Description
	9,000	96	Gravel surface, HSG D
	66,349	98	Unconnected pavement, HSG D
*	128,627	84	Meadow in array area, Fair, HSG D
	203,976	89	Weighted Average
	137,627		67.47% Pervious Area
	66,349		32.53% Impervious Area
	66,349		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

10-YEAR STORM

Summary for Subcatchment 7S: Solar Array - West Swale

Runoff = 18.18 cfs @ 12.19 hrs, Volume= 1.731 af, Depth> 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.70"

	Area (sf)	CN	Description
	9,000	96	Gravel surface, HSG D
	66,349	98	Unconnected pavement, HSG D
*	128,627	84	Meadow in array area, Fair, HSG D
	203,976	89	Weighted Average
	137,627		67.47% Pervious Area
	66,349		32.53% Impervious Area
	66,349		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

25-YEAR STORM

Summary for Subcatchment 7S: Solar Array - West Swale

Runoff = 23.37 cfs @ 12.19 hrs, Volume= 2.257 af, Depth> 5.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.09"

	Area (sf)	CN	Description
	9,000	96	Gravel surface, HSG D
	66,349	98	Unconnected pavement, HSG D
*	128,627	84	Meadow in array area, Fair, HSG D
	203,976	89	Weighted Average
	137,627		67.47% Pervious Area
	66,349		32.53% Impervious Area
	66,349		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

50-YEAR STORM

Summary for Subcatchment 7S: Solar Array - West Swale

Runoff = 27.09 cfs @ 12.19 hrs, Volume= 2.639 af, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.09"

	Area (sf)	CN	Description
	9,000	96	Gravel surface, HSG D
	66,349	98	Unconnected pavement, HSG D
*	128,627	84	Meadow in array area, Fair, HSG D
	203,976	89	Weighted Average
	137,627		67.47% Pervious Area
	66,349		32.53% Impervious Area
	66,349		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

100-YEAR STORM

Summary for Subcatchment 7S: Solar Array - West Swale

Runoff = 31.27 cfs @ 12.19 hrs, Volume= 3.072 af, Depth> 7.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=9.22"

	Area (sf)	CN	Description
	9,000	96	Gravel surface, HSG D
	66,349	98	Unconnected pavement, HSG D
*	128,627	84	Meadow in array area, Fair, HSG D
	203,976	89	Weighted Average
	137,627		67.47% Pervious Area
	66,349		32.53% Impervious Area
	66,349		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

SOLAR ARRAY EAST SWALE
WQ STORM

Summary for Subcatchment 8S: Solar Array - East Swale

Runoff = 1.18 cfs @ 12.22 hrs, Volume= 0.118 af, Depth> 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Storm Rainfall=1.00"

	Area (sf)	CN	Description
	85,074	98	Unconnected pavement, HSG D
*	132,910	84	Meadow in array area, Fair, HSG D
	217,984	89	Weighted Average
	132,910		60.97% Pervious Area
	85,074		39.03% Impervious Area
	85,074		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

1-YEAR STORM

Summary for Subcatchment 8S: Solar Array - East Swale

Runoff = 7.52 cfs @ 12.20 hrs, Volume= 0.693 af, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-year Rainfall=2.74"

	Area (sf)	CN	Description
	85,074	98	Unconnected pavement, HSG D
*	132,910	84	Meadow in array area, Fair, HSG D
	217,984	89	Weighted Average
	132,910		60.97% Pervious Area
	85,074		39.03% Impervious Area
	85,074		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

2-YEAR STORM

Summary for Subcatchment 8S: Solar Array - East Swale

Runoff = 10.48 cfs @ 12.19 hrs, Volume= 0.973 af, Depth> 2.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.48"

	Area (sf)	CN	Description
	85,074	98	Unconnected pavement, HSG D
*	132,910	84	Meadow in array area, Fair, HSG D
	217,984	89	Weighted Average
	132,910		60.97% Pervious Area
	85,074		39.03% Impervious Area
	85,074		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

5-YEAR STORM

Summary for Subcatchment 8S: Solar Array - East Swale

Runoff = 15.36 cfs @ 12.19 hrs, Volume= 1.446 af, Depth> 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-year Rainfall=4.69"

	Area (sf)	CN	Description
	85,074	98	Unconnected pavement, HSG D
*	132,910	84	Meadow in array area, Fair, HSG D
	217,984	89	Weighted Average
	132,910		60.97% Pervious Area
	85,074		39.03% Impervious Area
	85,074		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

10-YEAR STORM

Summary for Subcatchment 8S: Solar Array - East Swale

Runoff = 19.42 cfs @ 12.19 hrs, Volume= 1.850 af, Depth> 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.70"

	Area (sf)	CN	Description
	85,074	98	Unconnected pavement, HSG D
*	132,910	84	Meadow in array area, Fair, HSG D
	217,984	89	Weighted Average
	132,910		60.97% Pervious Area
	85,074		39.03% Impervious Area
	85,074		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

25-YEAR STORM

Summary for Subcatchment 8S: Solar Array - East Swale

Runoff = 24.98 cfs @ 12.19 hrs, Volume= 2.412 af, Depth> 5.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.09"

	Area (sf)	CN	Description
	85,074	98	Unconnected pavement, HSG D
*	132,910	84	Meadow in array area, Fair, HSG D
	217,984	89	Weighted Average
	132,910		60.97% Pervious Area
	85,074		39.03% Impervious Area
	85,074		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

50-YEAR STORM

Summary for Subcatchment 8S: Solar Array - East Swale

Runoff = 28.95 cfs @ 12.19 hrs, Volume= 2.820 af, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.09"

	Area (sf)	CN	Description
	85,074	98	Unconnected pavement, HSG D
*	132,910	84	Meadow in array area, Fair, HSG D
	217,984	89	Weighted Average
	132,910		60.97% Pervious Area
	85,074		39.03% Impervious Area
	85,074		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

100-YEAR STORM

Summary for Subcatchment 8S: Solar Array - East Swale

Runoff = 33.42 cfs @ 12.19 hrs, Volume= 3.282 af, Depth> 7.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=9.22"

	Area (sf)	CN	Description
	85,074	98	Unconnected pavement, HSG D
*	132,910	84	Meadow in array area, Fair, HSG D
	217,984	89	Weighted Average
	132,910		60.97% Pervious Area
	85,074		39.03% Impervious Area
	85,074		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

CONSTRUCTED WETLAND ROUTING RESULTS:
WQ STORM

Summary for Pond 9P: Constructed Wetland

Inflow Area = 9.687 ac, 35.89% Impervious, Inflow Depth > 0.28" for WQ Storm event
Inflow = 2.28 cfs @ 12.22 hrs, Volume= 0.229 af
Outflow = 0.06 cfs @ 23.01 hrs, Volume= 0.027 af, Atten= 97%, Lag= 647.9 min
Primary = 0.06 cfs @ 23.01 hrs, Volume= 0.027 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,279.16' @ 23.01 hrs Surf.Area= 8,254 sf Storage= 8,817 cf

Plug-Flow detention time= 540.8 min calculated for 0.027 af (12% of inflow)
Center-of-Mass det. time= 385.9 min (1,261.3 - 875.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,278.00'	94,982 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,278.00	6,940	0	0
1,280.00	9,205	16,145	16,145
1,282.00	11,702	20,907	37,052
1,284.00	14,426	26,128	63,180
1,286.00	17,376	31,802	94,982

Device	Routing	Invert	Outlet Devices
#1	Primary	1,278.00'	**24.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,278.00' / 1,276.00' S= 0.0364 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,279.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,280.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,281.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	1,282.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#6	Device 1	1,283.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#7	Device 1	1,284.00'	**16.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#8	Primary	1,284.50'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.06 cfs @ 23.01 hrs HW=1,279.16' (Free Discharge)
- **1=Culvert** (Passes 0.06 cfs of 6.93 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.06 cfs @ 1.36 fps)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **4=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Orifice/Grate** (Controls 0.00 cfs)
  - **6=Orifice/Grate** (Controls 0.00 cfs)
  - **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **8=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

1-YEAR STORM

Summary for Pond 9P: Constructed Wetland

Inflow Area = 9.687 ac, 35.89% Impervious, Inflow Depth > 1.66" for 1-year event
Inflow = 14.56 cfs @ 12.20 hrs, Volume= 1.342 af
Outflow = 2.26 cfs @ 12.94 hrs, Volume= 0.984 af, Atten= 85%, Lag= 44.4 min
Primary = 2.26 cfs @ 12.94 hrs, Volume= 0.984 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,281.45' @ 12.94 hrs Surf.Area= 11,021 sf Storage= 30,859 cf

Plug-Flow detention time= 239.1 min calculated for 0.984 af (73% of inflow)
Center-of-Mass det. time= 150.7 min (974.1 - 823.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,278.00'	94,982 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,278.00	6,940	0	0
1,280.00	9,205	16,145	16,145
1,282.00	11,702	20,907	37,052
1,284.00	14,426	26,128	63,180
1,286.00	17,376	31,802	94,982

Device	Routing	Invert	Outlet Devices
#1	Primary	1,278.00'	**24.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,278.00' / 1,276.00' S= 0.0364 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,279.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,280.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,281.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	1,282.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#6	Device 1	1,283.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#7	Device 1	1,284.00'	**16.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#8	Primary	1,284.50'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=2.26 cfs @ 12.94 hrs HW=1,281.45' (Free Discharge)
- **1=Culvert** (Passes 2.26 cfs of 23.70 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.64 cfs @ 7.28 fps)
  - **3=Orifice/Grate** (Orifice Controls 1.04 cfs @ 5.28 fps)
  - **4=Orifice/Grate** (Orifice Controls 0.58 cfs @ 2.30 fps)
  - **5=Orifice/Grate** (Controls 0.00 cfs)
  - **6=Orifice/Grate** (Controls 0.00 cfs)
  - **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **8=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

2-YEAR STORM

Summary for Pond 9P: Constructed Wetland

Inflow Area = 9.687 ac, 35.89% Impervious, Inflow Depth > 2.33" for 2-year event
Inflow = 20.29 cfs @ 12.19 hrs, Volume= 1.884 af
Outflow = 4.28 cfs @ 12.74 hrs, Volume= 1.500 af, Atten= 79%, Lag= 32.7 min
Primary = 4.28 cfs @ 12.74 hrs, Volume= 1.500 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,282.38' @ 12.74 hrs Surf.Area= 12,217 sf Storage= 41,576 cf

Plug-Flow detention time= 206.7 min calculated for 1.500 af (80% of inflow)
Center-of-Mass det. time= 131.1 min (944.9 - 813.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,278.00'	94,982 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,278.00	6,940	0	0
1,280.00	9,205	16,145	16,145
1,282.00	11,702	20,907	37,052
1,284.00	14,426	26,128	63,180
1,286.00	17,376	31,802	94,982

Device	Routing	Invert	Outlet Devices
#1	Primary	1,278.00'	**24.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,278.00' / 1,276.00' S= 0.0364 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,279.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,280.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,281.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	1,282.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#6	Device 1	1,283.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#7	Device 1	1,284.00'	**16.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#8	Primary	1,284.50'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=4.28 cfs @ 12.74 hrs HW=1,282.38' (Free Discharge)
- **1=Culvert** (Passes 4.28 cfs of 27.80 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.75 cfs @ 8.63 fps)
  - **3=Orifice/Grate** (Orifice Controls 1.38 cfs @ 7.02 fps)
  - **4=Orifice/Grate** (Orifice Controls 1.72 cfs @ 4.92 fps)
  - **5=Orifice/Grate** (Orifice Controls 0.43 cfs @ 2.09 fps)
  - **6=Orifice/Grate** (Controls 0.00 cfs)
  - **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **8=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

5-YEAR STORM

Summary for Pond 9P: Constructed Wetland

Inflow Area = 9.687 ac, 35.89% Impervious, Inflow Depth > 3.47" for 5-year event
Inflow = 29.73 cfs @ 12.19 hrs, Volume= 2.800 af
Outflow = 8.13 cfs @ 12.65 hrs, Volume= 2.389 af, Atten= 73%, Lag= 27.3 min
Primary = 8.13 cfs @ 12.65 hrs, Volume= 2.389 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,283.67' @ 12.65 hrs Surf.Area= 13,976 sf Storage= 58,491 cf

Plug-Flow detention time= 177.3 min calculated for 2.384 af (85% of inflow)
Center-of-Mass det. time= 116.1 min (918.9 - 802.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,278.00'	94,982 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,278.00	6,940	0	0
1,280.00	9,205	16,145	16,145
1,282.00	11,702	20,907	37,052
1,284.00	14,426	26,128	63,180
1,286.00	17,376	31,802	94,982

Device	Routing	Invert	Outlet Devices
#1	Primary	1,278.00'	**24.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,278.00' / 1,276.00' S= 0.0364 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,279.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,280.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,281.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	1,282.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#6	Device 1	1,283.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#7	Device 1	1,284.00'	**16.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#8	Primary	1,284.50'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=8.13 cfs @ 12.65 hrs HW=1,283.67' (Free Discharge)
- **1=Culvert** (Passes 8.13 cfs of 32.69 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.89 cfs @ 10.22 fps)
  - **3=Orifice/Grate** (Orifice Controls 1.75 cfs @ 8.90 fps)
  - **4=Orifice/Grate** (Orifice Controls 2.57 cfs @ 7.36 fps)
  - **5=Orifice/Grate** (Orifice Controls 1.94 cfs @ 5.57 fps)
  - **6=Orifice/Grate** (Orifice Controls 0.97 cfs @ 2.79 fps)
  - **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **8=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

10-YEAR STORM

Summary for Pond 9P: Constructed Wetland

Inflow Area = 9.687 ac, 35.89% Impervious, Inflow Depth > 4.44" for 10-year event
Inflow = 37.60 cfs @ 12.19 hrs, Volume= 3.581 af
Outflow = 17.59 cfs @ 12.49 hrs, Volume= 3.150 af, Atten= 53%, Lag= 17.9 min
Primary = 17.59 cfs @ 12.49 hrs, Volume= 3.150 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,284.32' @ 12.49 hrs Surf.Area= 14,896 sf Storage= 67,847 cf

Plug-Flow detention time= 159.4 min calculated for 3.150 af (88% of inflow)
Center-of-Mass det. time= 105.1 min (901.2 - 796.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,278.00'	94,982 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,278.00	6,940	0	0
1,280.00	9,205	16,145	16,145
1,282.00	11,702	20,907	37,052
1,284.00	14,426	26,128	63,180
1,286.00	17,376	31,802	94,982

Device	Routing	Invert	Outlet Devices
#1	Primary	1,278.00'	**24.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,278.00' / 1,276.00' S= 0.0364 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,279.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,280.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,281.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	1,282.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#6	Device 1	1,283.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#7	Device 1	1,284.00'	**16.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#8	Primary	1,284.50'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=17.48 cfs @ 12.49 hrs HW=1,284.32' (Free Discharge)
- **1=Culvert** (Passes 17.48 cfs of 34.88 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.95 cfs @ 10.93 fps)
  - **3=Orifice/Grate** (Orifice Controls 1.91 cfs @ 9.71 fps)
  - **4=Orifice/Grate** (Orifice Controls 2.90 cfs @ 8.32 fps)
  - **5=Orifice/Grate** (Orifice Controls 2.37 cfs @ 6.78 fps)
  - **6=Orifice/Grate** (Orifice Controls 1.67 cfs @ 4.77 fps)
  - **7=Broad-Crested Rectangular Weir** (Weir Controls 7.69 cfs @ 1.52 fps)
- **8=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

25-YEAR STORM

Summary for Pond 9P: Constructed Wetland

Inflow Area = 9.687 ac, 35.89% Impervious, Inflow Depth > 5.78" for 25-year event
Inflow = 48.36 cfs @ 12.19 hrs, Volume= 4.669 af
Outflow = 34.96 cfs @ 12.33 hrs, Volume= 4.208 af, Atten= 28%, Lag= 8.7 min
Primary = 34.96 cfs @ 12.33 hrs, Volume= 4.208 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,284.66' @ 12.34 hrs Surf.Area= 15,392 sf Storage= 72,946 cf

Plug-Flow detention time= 137.5 min calculated for 4.199 af (90% of inflow)
Center-of-Mass det. time= 90.7 min (879.7 - 789.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,278.00'	94,982 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,278.00	6,940	0	0
1,280.00	9,205	16,145	16,145
1,282.00	11,702	20,907	37,052
1,284.00	14,426	26,128	63,180
1,286.00	17,376	31,802	94,982

Device	Routing	Invert	Outlet Devices
#1	Primary	1,278.00'	**24.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,278.00' / 1,276.00' S= 0.0364 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,279.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,280.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,281.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	1,282.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#6	Device 1	1,283.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#7	Device 1	1,284.00'	**16.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#8	Primary	1,284.50'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=34.88 cfs @ 12.33 hrs HW=1,284.65' (Free Discharge)
- **1=Culvert** (Passes 33.78 cfs of 35.96 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.98 cfs @ 11.27 fps)
  - **3=Orifice/Grate** (Orifice Controls 1.98 cfs @ 10.10 fps)
  - **4=Orifice/Grate** (Orifice Controls 3.06 cfs @ 8.77 fps)
  - **5=Orifice/Grate** (Orifice Controls 2.56 cfs @ 7.33 fps)
  - **6=Orifice/Grate** (Orifice Controls 1.93 cfs @ 5.52 fps)
  - **7=Broad-Crested Rectangular Weir** (Weir Controls 23.27 cfs @ 2.24 fps)
- **8=Broad-Crested Rectangular Weir** (Weir Controls 1.10 cfs @ 0.92 fps)

50-YEAR STORM

Summary for Pond 9P: Constructed Wetland

Inflow Area = 9.687 ac, 35.89% Impervious, Inflow Depth > 6.76" for 50-year event
Inflow = 56.05 cfs @ 12.19 hrs, Volume= 5.458 af
Outflow = 42.12 cfs @ 12.32 hrs, Volume= 4.972 af, Atten= 25%, Lag= 7.8 min
Primary = 42.12 cfs @ 12.32 hrs, Volume= 4.972 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,284.91' @ 12.32 hrs Surf.Area= 15,771 sf Storage= 76,944 cf

Plug-Flow detention time= 127.2 min calculated for 4.972 af (91% of inflow)
Center-of-Mass det. time= 83.1 min (868.1 - 784.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,278.00'	94,982 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,278.00	6,940	0	0
1,280.00	9,205	16,145	16,145
1,282.00	11,702	20,907	37,052
1,284.00	14,426	26,128	63,180
1,286.00	17,376	31,802	94,982

Device	Routing	Invert	Outlet Devices
#1	Primary	1,278.00'	**24.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,278.00' / 1,276.00' S= 0.0364 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,279.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,280.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,281.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	1,282.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#6	Device 1	1,283.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#7	Device 1	1,284.00'	**16.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#8	Primary	1,284.50'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=41.86 cfs @ 12.32 hrs HW=1,284.90' (Free Discharge)
- **1=Culvert** (Inlet Controls 36.75 cfs @ 11.70 fps)
  - **2=Orifice/Grate** (Passes < 1.01 cfs potential flow)
  - **3=Orifice/Grate** (Passes < 2.04 cfs potential flow)
  - **4=Orifice/Grate** (Passes < 3.17 cfs potential flow)
  - **5=Orifice/Grate** (Passes < 2.69 cfs potential flow)
  - **6=Orifice/Grate** (Passes < 2.10 cfs potential flow)
  - **7=Broad-Crested Rectangular Weir** (Passes < 39.95 cfs potential flow)
- **8=Broad-Crested Rectangular Weir** (Weir Controls 5.12 cfs @ 1.59 fps)

100-YEAR STORM

Summary for Pond 9P: Constructed Wetland

Inflow Area = 9.687 ac, 35.89% Impervious, Inflow Depth > 7.87" for 100-year event
Inflow = 64.69 cfs @ 12.19 hrs, Volume= 6.354 af
Outflow = 50.34 cfs @ 12.31 hrs, Volume= 5.838 af, Atten= 22%, Lag= 7.2 min
Primary = 50.34 cfs @ 12.31 hrs, Volume= 5.838 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,285.20' @ 12.31 hrs Surf.Area= 16,199 sf Storage= 81,590 cf

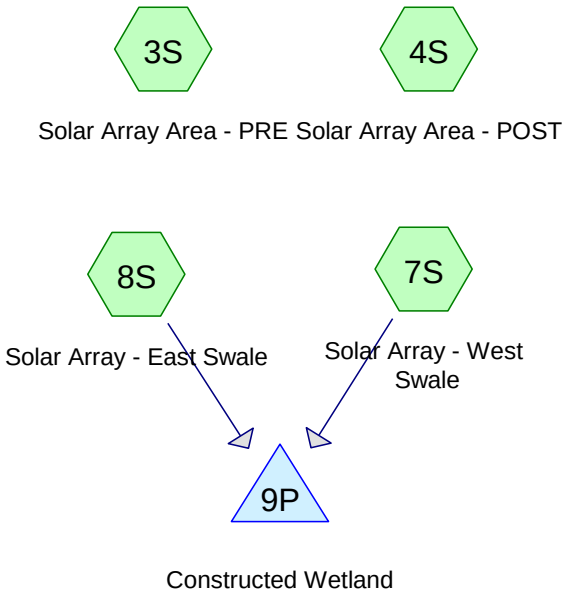
Plug-Flow detention time= 117.2 min calculated for 5.826 af (92% of inflow)
Center-of-Mass det. time= 76.5 min (857.6 - 781.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,278.00'	94,982 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,278.00	6,940	0	0
1,280.00	9,205	16,145	16,145
1,282.00	11,702	20,907	37,052
1,284.00	14,426	26,128	63,180
1,286.00	17,376	31,802	94,982

Device	Routing	Invert	Outlet Devices
#1	Primary	1,278.00'	**24.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,278.00' / 1,276.00' S= 0.0364 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,279.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,280.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,281.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	1,282.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#6	Device 1	1,283.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#7	Device 1	1,284.00'	**16.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#8	Primary	1,284.50'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=50.14 cfs @ 12.31 hrs HW=1,285.20' (Free Discharge)
- **1=Culvert** (Inlet Controls 37.65 cfs @ 11.98 fps)
  - **2=Orifice/Grate** (Passes < 1.03 cfs potential flow)
  - **3=Orifice/Grate** (Passes < 2.10 cfs potential flow)
  - **4=Orifice/Grate** (Passes < 3.30 cfs potential flow)
  - **5=Orifice/Grate** (Passes < 2.84 cfs potential flow)
  - **6=Orifice/Grate** (Passes < 2.29 cfs potential flow)
  - **7=Broad-Crested Rectangular Weir** (Passes < 64.38 cfs potential flow)
- **8=Broad-Crested Rectangular Weir** (Weir Controls 12.49 cfs @ 2.24 fps)



HydroCAD Diagram

CONCLUSION

The analysis and design of the stormwater conveyance system exceeds the requirements found in Appendix "I" from the CT DEP. The design of the Constructed Wetland conforms to the standards found in the CT DEEP 2004 Storm Water Quality Manual in order to reduce non-point source pollutants from the site. The design provides the Channel Protection Volume per the 2004 Manual which will prevent adverse impacts to the receiving streams on this site. Peak rate attenuation is provided for the 1-year, 2-year, 5-year and 10-year rainfall events.

Flows directed to the existing wetland system from the Constructed Wetlands will have velocities less than 3 fps, which are non-erosive for this type of soil, so there will be no erosion of the receiving inland wetlands.

While there will be some filling of wetlands for the access driveway, it is unavoidable and has been minimized to the maximum extent possible through using a narrow driveway and boulder retaining wall to limit the extent of fill within the wetland area.

There will be no impact on any of the other wetlands on this site as a result of the construction of the access driveway, stormwater management system and solar array.

Steven Trinkaus, PE
Trinkaus Engineering, LLC

APPENDIX “A”
SOIL TEST RESULTS WITHIN AREA OF PROPOSED SOLAR ARRAY

DT – 28

0 – 9”	TOPSOIL
9 – 22”	YELLOW BROWN FINE SANDY LOAM
22 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 22”, MOTTLING AT 22”

DT – 29

0 – 6”	TOPSOIL
6 – 26”	YELLOW BROWN FINE SANDY LOAM, SOME SILT
26 – 77”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 77”, ROOTS TO 26”, MOTTLING AT 26”

DT – 32

0 – 6”	TOPSOIL
6 – 20”	YELLOW BROWN FINE SANDY LOAM, SOME SILT
20 – 75”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 75”, ROOTS TO 22”, MOTTLING AT 22”

DT – 33

0 – 6”	TOPSOIL
6 – 15”	YELLOW BROWN FINE SANDY LOAM
15 – 22”	LIGHT YELLOW BROWN SANDY LOAM
22 – 77”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 77”, ROOTS TO 22”, MOTTLING AT 22”

DT – 35

0 – 6”	TOPSOIL
6 – 20”	ORANGE BROWN FINE SANDY LOAM
20 – 30”	YELLOW BROWN FINE SANDY LOAM
30 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 30”, MOTTLING AT 30”

DT – 71

0 – 6”	TOPSOIL
6 – 23”	ORANGE BROWN FINE SAND & SILT LOAM
23 – 81”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 81”, ROOTS TO 23”, MOTTLING AT 23”, WATER
	BLEEDING AT 27”

DT – 72

0 – 6”	TOPSOIL
6 – 26”	O0RANGE BROWN FINE SANDY LOAM, SOME SILT
26 – 84”	GREY BROWN MEDIUM COMPACT SAND AND SILT
	LEDGE > 84”, ROOTS TO 26”, MOTTLING AT 26”, WATER BLEEDING AT 24”

DT – 73

0 – 6”	TOPSOIL
6 – 24”	ORANGE BROWN FINE SANDY LOAM, SOME SILT
24 – 81”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 81”, ROOTS TO 24”, MOTTLING AT 24”, WATER
	BLEEDING AT 28”

DT – 74

0 – 6”	TOPSOIL
6 – 24”	ORANGE BROWN FINE SAND & SILT LOAM
24 – 75”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 75”, ROOTS TO 24”, MOTTLING AT 24”, WATER BLEEDING AT 28”

DT – 75

0 – 6”	TOPSOIL
6 – 23”	PALE YELLOW BROWN FINE SAND & SILT LOAM
23 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 23”, MOTTLING AT 23”, WATER BLEEDING AT 28”

DT – 76

0 – 6”	TOPSOIL
6 – 24”	ORANGE BROWN FINE SAND & SILT LOAM
24 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 24”, MOTTLING AT 24”, WATER BLEEDING AT 27”

DT – 77

0 – 5”	TOPSOIL
5 – 23”	ORANGE BROWN FINE SAND AND SILT LOAM
23 – 77”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 77”, ROOTS TO 23”, MOTTLING AT 23”, WATER BLEEDING AT 28”

DT – 78

0 – 3”	TOPSOIL
3 – 19”	ORANGE BROWN FINE SAND & SILT LOAM
19 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 19”, MOTTLING AT 19”, WATER BLEEDING AT 23”

DT – 79

0 – 5”	TOPSOIL
5 – 20”	YELLOW BROWN SILT LOAM
20 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 20”, MOTTLING AT 20”, WATER BLEEDING AT 24”

DT – 80

0 – 6”	TOPSOIL
6 – 20”	YELLOW BROWN FINE SAND & SILT LOAM
20 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 20”, MOTTLING AT 20”, WATER BLEEDING AT 23”

DT – 81

0 – 5”	TOPSOIL
5 – 20”	PALE YELLOW BROWN FINE SAND & SILT LOAM
20 – 81”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 81”, ROOTS TO 20”, MOTTLING AT 20”, WATER BLEEDING AT 23”

DT – 82

0 – 5”	TOPSOIL
5 – 22”	PALE YELLOW BROWN FINE SAND & SILT LOAM
22 – 77”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 77”, ROOTS TO 19”, MOTTLING AT 19”, WATER BLEEDING AT 22”

DT – 83

0 – 6”	TOPSOIL
6 – 23”	PALE YELLOW BROWN FINE SAND & SILT LOAM
23 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 23”, MOTTLING AT 23”, WATER BLEEDING AT 28”

DT – 84

0 – 6”	TOPSOIL
6 – 21”	PALE YELLOW BROWN FINE SAND & SILT LOAM
21 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 21”, MOTTLING AT 21”, WATER BLEEDING AT 22”

DT – 85

0 – 6”	TOPSOIL
6 – 24”	PALE YELLOW BROWN FINE SAND & SILT LOAM
24 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 24”, MOTTLING AT 24”, WATER BLEEDING AT 27”

DT – 86

0 – 5”	TOPSOIL
5 – 23”	YELLOW BROWN FINE SAND & SILT LOAM
23 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 23”, MOTTLING AT 23”, WATER BLEEDING AT 27”

DT – 87

0 – 3”	TOPSOIL
3 – 21”	YELLOW BROWN FINE SAND & SILT LOAM
21 – 80”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 80”, ROOTS TO 21”, MOTTLING AT 21”, WATER BLEEDING AT 24”

DT – 88

0 – 4”	TOPSOIL
4 – 21”	YELLOW BROWN FINE SAND & SILT LOAM
21 – 83”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 83”, ROOTS TO 21”, MOTTLING AT 21”, WATER BLEEDING AT 24”

DT – 89

0 – 6”	TOPSOIL
6 – 21”	YELLOW BROWN FINE SAND & SILT LOAM
21 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 21”, MOTTLING AT 21”, WATER BLEEDING AT 24”

DT – 102

0 – 3”	TOPSOIL
3 – 24”	YELLOW BROWN FINE SANDY LOAM
24 – 36”	GREY BROWN MEDIUM COARSE SAND
36 – 84”	GREY BROWN MEDIUM COMPACT SAND & GRAVEL
	LEDGE > 84”, ROOTS TO 36”, LIGHT MOTTLING AT 36”,

DT – 103

0 – 3”	TOPSOIL
3 – 22”	YELLOW BROWN FINE SANDY LOAM
22 – 361”	GREY BROWN MEDIUM COARSE SAND
31 – 81”	GREY BROWN MEDIUM COMPACT SAND & GRAVEL
	LEDGE > 81”, ROOTS TO 31”, LIGHT MOTTLING AT 31”,

DT – 104

0 – 3”	TOPSOIL
3 – 24”	YELLOW BROWN FINE SANDY LOAM
24 – 36”	GREY BROWN MEDIUM COARSE SAND
36 – 84”	GREY BROWN MEDIUM COMPACT SAND & GRAVEL
	LEDGE > 84”, ROOTS TO 36”, LIGHT MOTTLING AT 36”,

DT – 105

0 – 3”	TOPSOIL
3 – 19”	YELLOW BROWN FINE SANDY LOAM
19 – 31”	GREY BROWN MEDIUM COARSE SAND
31 – 84”	GREY BROWN MEDIUM COMPACT SAND & GRAVEL
	LEDGE > 84”, ROOTS TO 31”, LIGHT MOTTLING AT 31”,

DT – 106

0 – 3”	TOPSOIL
3 – 19”	YELLOW BROWN FINE SANDY LOAM
19 – 30”	GREY BROWN MEDIUM COARSE SAND
30 – 83”	GREY BROWN MEDIUM COMPACT SAND & GRAVEL
	LEDGE > 84”, ROOTS TO 30”, LIGHT MOTTLING AT 30”,

DT – 107

0 – 3”	TOPSOIL

3 – 21” YELLOW BROWN FINE SANDY LOAM
21 – 33” GREY BROWN MEDIUM COARSE SAND
33 – 84” GREY BROWN MEDIUM COMPACT SAND & GRAVEL
LEDGE > 84”, ROOTS TO 33”, LIGHT MOTTLING AT 33”,

DT – 108
0 – 4” TOPSOIL
3 – 24” YELLOW BROWN FINE SANDY LOAM
26 – 84” GREY BROWN MEDIUM COMPACT SAND & GRAVEL
LEDGE > 84”, ROOTS TO 26”, LIGHT MOTTLING AT 26”,

DT – 109
0 – 8” TOPSOIL
8 – 26” YELLOW BROWN FINE SANDY LOAM
26 – 84” GREY BROWN MEDIUM COMPACT SAND & GRAVEL
LEDGE > 84”, ROOTS TO 26”, LIGHT MOTTLING AT 26”,

DT – 111
0 – 6” TOPSOIL
6 – 28” ORANGE BROWN FINE SAND & SILT LOAM
28 – 77” GREY BROWN MEDIUM COMPACT SILTY SAND
LEDGE > 77”, ROOTS TO 28”, LIGHT MOTTLING AT 28”

DT – 112
0 – 3” TOPSOIL
3 – 22” ORANGE BROWN FINE SANDY LOAM
22 – 32” YELLOW BROWN FINE SANDY LOAM
32 – 84” GREY BROWN MEDIUM COMPACT SILTY SAND
LEDGE > 84”, ROOTS TO 32”, LIGHT MOTTLING AT 32”,
NO WATER

DT – 113
0 – 4” TOPSOIL
4 – 18” ORANGE BROWN FINE SANDY LOAM
18 – 27” YELLOW BROWN FINE SANDY LOAM
27 – 84” GREY BROWN MEDIUM COMPACT SILTY SAND
LEDGE > 84”, ROOTS TO 27”, LIGHT MOTTLING AT 27”,
NO WATER

DT – 114
0 – 3” TOPSOIL
3 – 18” ORANGE BROWN FINE SANDY LOAM
18 – 25” YELLOW BROWN FINE SANDY LOAM
25 – 81” GREY BROWN MEDIUM COMPACT SILTY SAND
LEDGE > 81”, ROOTS TO 25”, LIGHT MOTTLING AT 25”,
NO WATER

DT – 115

0 – 6”	TOPSOIL
6 – 21”	YELLOW BROWN FINE SANDY LOAM, SOME SILT
21 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND LEDGE > 84”, ROOTS TO 21”, MOTTLING AT 21”, NO WATER

DT – 116

0 – 6”	TOPSOIL
6 – 25”	YELLOW BROWN FINE SANDY LOAM, SOME SILT
25 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND LEDGE > 84”, ROOTS TO 25”, MOTTLING AT 25”, NO WATER

DT – 117

0 – 4”	TOPSOIL
4 – 14”	ORANGE BROWN FINE SANDY LOAM
14 – 23”	YELLOW BROWN FINE SANDY LOAM
23 – 81”	GREY BROWN MEDIUM COMPACT SILTY SAND LEDGE > 81”, ROOTS TO 23”, MOTTLING AT 23’, NO WATER

DT – 118

0 – 5”	TOPSOIL
5 – 21”	YELLOW BROWN FINE SANDY LOAM
21 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND LEDGE > 84”, ROOTS TO 21”, MOTTLING AT 21”, NO WATER

DT – 119

0 – 7”	TOPSOIL
7 – 21”	YELLOW BROWN FINE SANDY LOAM
21 – 84”	GREY BROWN MEDIUM COMPACT SAND AND SILT LEDGE > 84”, ROOTS TO 21”, MOTTINGH AT 21”

DT – 120

0 – 5”	TOPSOIL
5 – 20”	YELLOW BROWN FINE SANDY LOAM
20 – 81”	GREY BROWN MEDIUM COMPACT SILTY SAND LEDGE > 81”, ROOTS TO 20”, MOTTLING AT 20”, NO WATER

DT – 121

0 – 6”	TOPSOIL
6 – 21”	YELLOW BROWN FINE SANDY LOAM
21 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND LEDGE > 84”, ROOTS TO 21”, MOTTLING AT 21”

DT – 122

0 – 7”	TOPSOIL
7 – 27”	YELLOW BROWN FINE SANDY LOAM
27 – 33”	GREY BROWN LIGHTLY COMPACT SAND AND GRAVEL
33 – 84”	GREY BROWN MEDIUM COMPACT SAND & GRAVEL, SOME SILT
	LEDGE > 84”, ROOTS TO 33”, MOTTLING AT 33”

DT – 123

0 – 6”	TOPSOIL
6 – 26”	YELLOW BROWN FINE SANDY LOAM
26 – 31”	GREY BROWN LIGHTLY COMPACT SAND & GRAVEL
31 – 72”	GREY BROWN MEDIUM COMPACT SAND & GRAVEL, SOME SILT
	LEDGE > 72”, ROOTS TO 31”, MOTTLING AT 31”

DT – 124

0 – 7”	TOPSOIL
7 – 23”	ORANGE BROWN FINE SANDY LOAM
23 – 31”	GREY BROWN LIGHTLY COMPACT SAND & GRAVEL
31 – 80”	GREY BROWN MEDIUM COMPACT SAND & GRAVEL, SOME SILT
	LEDGE > 80”, ROOTS TO 31”, MOTTLING AT 31”

DT – 133

0 – 6”	TOPSOIL
6 – 24”	YELLOW BROWN FINE SANDY LOAM, SOME SILT
24 – 78”	GREY BROWN COMPACT SILTY SAND, SOME GRAVEL
	LEDGE > 78”, ROOTS TO 24”, MOTTLING AT 24”

DT – 134

0 – 6”	TOPSOIL
6 – 23”	YELLOW BROWN FINE SANDY LOAM, SOME SILT
23 – 73”	GREY BROWN COMPACT SILTY SAND, SOME GRAVEL
	LEDGE > 73”, ROOTS TO 23”, MOTTLING AT 23”

DT – 135

0 – 9”	TOPSOIL
9 – 23”	YELLOW BROWN FINE SAND & SILT LOAM
23 – 78”	GREY BROWN COMPACT SILTY SAND, SOME GRAVEL
	LEDGE > 78”, ROOTS TO 23”, MOTTLING AT 23”

DT – 136

0 – 8”	TOPSOIL
8 – 25”	YELLOW BROWN FINE SAND & SILT LOAM
25 – 81”	GREY BROWN COMPACT SILTY SAND, SOME GRAVEL
	LEDGE > 81”, ROOTS TO 25”, MOTTLING AT 25”

DT – 137

0 – 5”	TOPSOIL
5 – 24”	YELLOW BROWN FINE SANDY LOAM, SOME SILT
24 – 77”	GREY BROWN COMPACT SILTY SAND, SOME GRAVEL
	LEDGE > 77”, ROOTS TO 24”, MOTTLING AT 24”

DT – 138

0 – 6”	TOPSOIL
6 – 23”	YELLOW BROWN FINE SANDY LOAM, SOME SILT
23 – 73”	GREY BROWN COMPACT SILTY SAND, SOME GRAVEL
	LEDGE > 73”, ROOTS TO 23”, MOTTLING AT 23”

APPENDIX “B”
ASSESSMENT OF PRIME FARMLAND SOILS
NATURAL RESOURCE CONSERVATION SERVICE

PHOTO DOCUMENTATION
1.99 MW SOLAR ARRAY
PLATT HILL ROAD
WINCHESTER – CONNECTICUT
PREPARED FOR LODESTAR ENERGY
APRIL 28, 2020

Trinkaus Engineering, LLC
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LIST OF PHOTOGRAPHS:

1. Standing on east side of road at northern property line looking east.
2. Standing on east side of road at southern property line looking east.
3. Standing on east side of road looking east at path of driveway access to solar array.
4. Standing on east side of road looking west at utility pole for power connection.
5. Standing on west side of wetland crossing #1 looking east (original corduroy crossing still in place).
6. Standing on west side of wetland crossing #2 looking east (original corduroy crossing still in place).
7. Standing at approximate southern limit of farmland soils looking north.
8. Standing south of southern vernal pool looking north at vernal pool – no egg masses were visible in pool. There was no water in northern vernal pool.
9. Standing south of wetland area with ponding looking north – no egg masses were visible in this wetland.
10. Standing at the north side of solar array on the ridge line looking to the southeast.
11. Standing at the north side of the solar array on the ridge line looking to the south.
12. Standing at the north side of the solar array on the ridge line looking to the southwest.
13. Standing at the south side of the solar array on the ridge line looking to the southeast.
14. Standing at the south side of the solar array on the ridge line looking to the south.
15. Standing at the south side of the solar array on the ridge line looking to the southwest.
16. Standing on the southern portion of the basin berm looking to the northeast.
17. Standing just north of the property corner looking to south along stone wall.
18. Standing on the downward side of the berm of the basin looking to the southwest to the stream where the outlet pipe will discharge onto riprap pad and then the stream.
19. Standing on the slope above stream just below confluence of two intermittent watercourses looking to the northwest.

Note: See PHOTO PLAN OF SITE, SUPPLEMENTAL PLAN, 1" = 200'; 4/28/2020 FOR LOCATION OF PHOTOS ON SITE TOPOGRAPHIC MAP. ALL PHOTOS TAKEN BY TRINKAUS ENGINEERING, LLC ON 4/28/2020

Figure 1 - STANDING ON EAST SIDE OF ROAD AT NORTHERN PROPERTY LINE LOOKING EAST

Figure 2 - STANDING ON EAST SIDE OF ROAD AT LOOKING EAST AT PROPERTY AND ADJACENT RESIDENCE

Figure 3 - STANDING ON EAST SIDE OF ROAD LOOKING EAST AT PATH OF DRIVEWAY ACCESS TO SOLAR ARRAY

Figure 4 - STANDING ON EAST SIDE OF ROAD LOOKING WEST AT UTILITY POLE FOR POWER CONNECTION

Figure 5 - STANDING ON THE WEST SIDE OF WETLAND CROSSING #1 LOOKING EAST (ORIGINAL CORDUROY CROSSING STILL IN PLACE)

Figure 6 - STANDING ON THE WEST SIDE OF WETLAND CROSSING #2 (ORIGINAL CORDUROY CROSSING STILL IN PLACE)

Figure 7 - STANDING AT THE APPROXIMATE SOUTHERN LIMIT FARMLAND SOILS LOOKING NORTH

Figure 8 - STANDING SOUTH OF SOUTHERN VERNAL POOL LOOKING NORTH AT VERNAL POOL - NO EGG MASSES WERE VISIBLE IN POOL. THERE WAS NO WATER IN NORTHERN VERNAL POOL

Figure 9 - STANDING SOUTH OF WETLAND AREA WITH PONDING LOOKING NORTH - NO EGG MASSES WERE VISIBLE IN THIS WETLAND

Figure 10 - STANDING AT THE NORTH SIDE OF SOLAR ARRAY ON RIDGE LINE LOOKING TO THE SOUTHEAST

Figure 11 - STANDING ON THE NORTH SIDE OF THE SOLAR ARRAY ON RIDGE LINE LOOKING TO THE SOUTH

Figure 12 - STANDING ON THE NORTH SIDE OF THE SOLAR ARRAY ON RIDGE LINE LOOKING TO THE SOUTHWEST

Figure 13 - STANDING ON THE SOUTH SIDE OF SOLAR ARRAY ON RIDGE LINE LOOKING TO THE SOUTHEAST

Figure 14 - STANDING ON THE SOUTH SIDE OF SOLAR ARRAY ON RIDGE LINE LOOKING TO THE SOUTH

Figure 15 - STANDING ON THE SOUTH SIDE OF SOLAR ARRAY ON RIDGE LINE LOOKING TO THE SOUTHWEST

Figure 16 - STANDING ON THE SOUTHERN PORTION OF BASIN LOOKING TO THE NORTHEAST

Figure 17 - STANDING JUST NORTH OF PROPERTY CORNER LOOKING SOUTH ALONG PROPERTY LINE

Figure 18 - STANDING ON DOWNWARD SIDE OF BERM OF BASIN LOOKING TO SOUTHWEST TO THE STREAM WHEN THE OUTLET PIPE WILL DISCHARGE ONTO RIPRAP PAD AND THEN THE STREAM

Figure 19 - STANDING ON SLOPE ABOVE STREAM JUST BELOW CONFLUENCE OF TWO INTERMITTENT WATERCOURSES LOOKING TO THE NORTHWEST