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September 7, 2018

VIA E-MAIL AND HAND DELIVERY

Melanie Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: Petition 1347 - GRE GACRUX LLC Petition for a Declaratory Ruling, Pursuant to Connecticut General Statutes §4-176 and §16-50k, for the Proposed Construction, Maintenance and Operation of a 16.78 MW AC Ground-mounted Solar Photovoltaic Electric Generating Facility Located on Oil Mill Road in Waterford, Connecticut

Dear Ms. Bachman:

I am enclosing an original and sixteen copies of GRE's Responses to the Connecticut Siting Council's First Set of Interrogatories in the above-referenced Petition. Please return one copy of this submittal, date-stamped, to my courier.

If you have any questions concerning this submittal, please contact the undersigned at your convenience. I certify that copies of this submittal have been submitted to the Town of Waterford and to Save the River-Save the Hills.

Sincerely,

Lee D. Hoffman

Lee D. Hoffman

Enclosures

ACTIVE/74725.48/LHOFFMAN/7657082v1

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Petition of GRE GACRUX LLC for a Declaratory Ruling pursuant to C.G.S. §4-176 and § 16-50k, for the proposed construction, maintenance and operation of a 16.78 MW AC ground-mounted solar photovoltaic electric generating facility located at 117 Oil Mill Road and associated electrical interconnection to Eversource Energy's existing substation at 325 Waterford Parkway North in Waterford, Connecticut	**Petition No. 1347** **September 7, 2018**

GRE GACRUX LLC'S RESPONSES TO THE CONNECTICUT SITING COUNCIL'S FIRST SET OF INTERROGATORIES

The petitioner, GRE GACRUX LLC ("GRE" or "the Petitioner"), respectfully submits this response to the Connecticut Siting Council's First Set of Interrogatories in the above-referenced Petition. In response to the Siting Council's Interrogatories, GRE states as follows:

Project Notice and Development

1. Site Plan BS-1 depicts the Dewolf parcel as abutting the project site. Was notice provided to this abutter?

   At the time of the notification of abutters, there were several abutter maps, and there was a discrepancy between those several maps. The abutter map we used at the time did not indicate that Dewolf parcel was an abutter to the Project. A formal letter was sent to the Dewolf residents on August 10, 2018, and a copy of that notice, along with proof of delivery, is included in this response as Exhibit A.

2. What is the relationship between the Petitioner and the developer? If the project is approved, identify all permits necessary for construction and operation and which entity will hold the permit(s)?

   GRE GACRUX LLC is the project level company that all project documents are held in. Greenskies Renewable Energy is sole owner of the project level company. With exception of the construction permits, which will be managed by the contractor, use permits and interconnection permits will be in the name of GRE GACRUX LLC. The Petitioner anticipates that one of the key construction permits for the project will be the

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, which is issued by the Connecticut Department of Energy and Environmental Protection ("DEEP"). GRE anticipates that the permitting for this project will be as follows:

Permit	Authority	Entity to Hold Permit
Federal		
Exempt Wholesale Generator (EWG) Status	Federal Energy Regulatory Commission (FERC)	GRE GACRUX LLC
State		
Declaratory Ruling that a Certificate of Environmental Compatibility and Public Need is not Required	Connecticut Siting Council (CSC)	GRE GACRUX LLC
Approval of Development and Management Plan	Connecticut Siting Council (CSC)	GRE GACRUX LLC
General Permit for Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities	Connecticut Department of Energy and Environmental Protection (CTDEEP)	Construction contractor and/or GRE GACRUX LLC
Qualification as a RPS Class I Renewable Generation Unit	Connecticut Public Utilities Regulatory Authority (PURA)	GRE GACRUX LLC
Local		
Town of Waterford	Building and Electrical Permit	Construction contractor and/or GRE GACRUX LLC

3. What entity/subcontractor will be constructing the facility? Has this entity/subcontractor constructed other solar projects 5 MW or greater in the Northeast? If so, list similar projects.

   GRE objects to this Interrogatory as the Interrogatory exceeds the scope of a petition for declaratory ruling pursuant to Conn. Gen. Stat. §§4-176 and 16-50K. Subject to the foregoing objection, GRE states that the contractor has not yet been chosen. GRE will select a large, high quality contractor with experience in the Northeast, as well as significant experience with similarly sized solar projects. GRE will not be selecting the contractor that was used for the construction of the solar PV facility in East Lyme, Connecticut.

4. Does the Petitioner have a contract to sell the electricity and renewable energy certificates (RECs) it expects to generate with the proposed project? If so, to which

public utility? If the electricity is to be sold to more than one public utility, provide the percentage to be sold to each public utility.

GRE objects to this Interrogatory as the Interrogatory exceeds the scope of a petition for declaratory ruling pursuant to Conn. Gen. Stat. §§4-176 and 16-50K. Subject to the foregoing objection, GRE states it is a signatory to a contract that provides that approximately eighty (80) percent of the Project's electricity and RECs will be sold to Eversource Energy, with the remaining twenty (20) percent to be sold to the United Illuminating Company.

5. What authority approves the power purchase agreement (PPA) for the facility? Has a PPA with an electric distribution company been executed? If so, at what alternating current megawatt output? If not, when would the PPA be finalized?

   GRE objects to this Interrogatory as the Interrogatory exceeds the scope of a petition for declaratory ruling pursuant to Conn. Gen. Stat. §§4-176 and 16-50K. Subject to the foregoing objection, GRE states that the Public Utilities Regulatory Authority (PURA) approved the PPA for the facility on September 7, 2017. As indicated in the response to Interrogatory 4, a PPA has been executed with two electric distribution companies, and the PPA calls for 17.73 megawatts of output.

6. What is the length of the PPA? Are there provisions for any extension of time in the PPA? Is there an option to renew?

   GRE objects to this Interrogatory as the Interrogatory exceeds the scope of a petition for declaratory ruling pursuant to Conn. Gen. Stat. §§4-176 and 16-50K. Subject to the foregoing objection, GRE states that the length of the PPA is twenty (20) years. There are no options available for renewal or extensions of the length of the PPA.

7. Is the alternating current megawatt capacity of the facility fixed at a certain amount per the PPA and/or the RFP? Is there an option within the PPA to allow for changes in the total output of the facility based on unforeseen circumstances?

   GRE objects to this Interrogatory as the Interrogatory exceeds the scope of a petition for declaratory ruling pursuant to Conn. Gen. Stat. §§4-176 and 16-50K. Subject to the foregoing objection, GRE states that the PPA allows for changes of less than two (2) megawatts in total output.

8. Was this Project selected using a higher output than what is proposed? If so, why was the output reduced to 16.78 MW AC?

   GRE objects to this Interrogatory as the Interrogatory exceeds the scope of a petition for declaratory ruling pursuant to Conn. Gen. Stat. §§4-176 and 16-50K. Subject to the foregoing objection, GRE states that the capacity being sought in this Petition has been reduced due to larger than predicted wetland buffer zones.

9. Would the Petitioner participate in the ISO-NE Forward Capacity Auction? If yes, which auction(s) and capacity commitment period?

   GRE objects to this Interrogatory as the Interrogatory exceeds the scope of a petition for declaratory ruling pursuant to Conn. Gen. Stat. §§4-176 and 16-50K. Subject to the foregoing objection, GRE states that there is potential, but no obligation, for the Petitioner to participate in the ISO-NE Forward Capacity Auction. ISO-NE Forward Capacity Auction 13 would be the first auction the Petitioner could participate in. The Petitioner currently has no plans to participate in the ISO-NE Forward Capacity Auction.

Proposed Site

10. Provide a depiction of the site on aerial imagery of the following:
    a) property boundaries that comprise the project site;
    b) electrical interconnection equipment, utility pole locations, and tie-in with the transmission/distribution grid or substation; and
    c) solar field, access roads, detention basins, and embankments.

    These depictions are provided in Drawings SP-0.0 through SP-0.4 and SU-0.1 through SU-0.4, which are included as Exhibit B to these responses.

11. Is the site parcel, or any portion thereof, part of the Public Act 490 Program? If so, how does the municipal land use code classify the parcel(s)? For example, is/are the parcel(s) classified as "Tillable D – good to fair"? How would the solar Project affect the use classification?

    GRE objects to this Interrogatory as the Interrogatory exceeds the scope of a petition for declaratory ruling pursuant to Conn. Gen. Stat. §§4-176 and 16-50K. Subject to the foregoing objection, GRE states it is GRE's understanding that the parcel is classified as woodland forest; however, the construction of the proposed Project would cause that classification to be changed.

12. Have any land use development plans been previously approved by the municipality for the proposed site in the past?

    GRE objects to this Interrogatory as the Interrogatory exceeds the scope of a petition for declaratory ruling pursuant to Conn. Gen. Stat. §§4-176 and 16-50K. Subject to the foregoing objection, GRE states that it is not aware of any land use development plans approved by the Town of Waterford for the proposed Site, however, GRE's knowledge of the Town's past plans may be incomplete.

13. What type of development and minimum lot size is required per the RU-120 zoning designation?

It is GRE's understanding that the minimum lot size for RU-120 is 120,000 sq. ft. Uses approved by right in this zone include residential, farming, parks, playgrounds, and libraries. A variety of commercial, municipal, and private uses are allowed by special permit, including but not limited to, substations, utility infrastructure, hospitals, cemeteries, etc.

It should also be noted that, as indicated on the map that is included with these responses as Exhibit C, approximately seventy (70) percent of the property abutting the proposed Project is zoned for industrial use.

14. Petition p. 4 lists residential use to west and north - would the Project be visible from these residential areas?

    Given the topography of the Site and the surrounding area, so long as the viewer is below the height of the tree level, the proposed Project will not be visible.

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

    GRE objects to this Interrogatory as the Interrogatory exceeds the scope of a petition for declaratory ruling pursuant to Conn. Gen. Stat. §§4-176 and 16-50K. Subject to the foregoing objection, GRE states that the Ground Lease between the parties states that, upon either expiration or termination of the Ground Lease, the solar array and all related fixtures must be removed by Tenant. A copy of the Ground Lease, redacted as to financial terms only, is included with these responses as Exhibit D.

16. Does the decommissioning plan have any provisions for the removal of the stormwater control system or will the system have to remain to maintain hydrological conditions?

    Since the stormwater control system has not yet been fully developed, nor has the project applied for DEEP's General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, it would be premature for GRE to determine whether the stormwater control system would need to be removed as part of the decommissioning plan. However, should the Council so desire, GRE can address this issue as part of its D&M Plan, should the Petition be granted. With that having been said, it is likely that the stormwater control system will need to remain in place for a period of time after decommissioning to maintain hydrological conditions, depending on post-decommissioning use of the site.

Energy Production

17. Identify the loss assumption(s) for the proposed project. For example, would the proposed facility provide 16.78 MW AC at the point of interconnection? Is the 16.78

MW AC rating based on operation under optimal conditions or is it an average of expected daily conditions?

16.78 MW is the nameplate capacity for the project. As such, 16.78 MW is also the maximum power output anticipated for the Project. Depending on conditions, the output will vary and will on occasions be lower.

18. What is the projected capacity factor (expressed as a percentage) for the proposed project?

    The anticipated capacity factor for the Project is 20.8 %.

19. Referring to Petition p. 16, why was a solar panel orientation of 25 degrees selected for this facility. Is the project designed to maximize annual energy production or peak load shaving?

    The twenty-five (25) degree tilt is an optimized design to both maximize annual energy production balanced with maximizing rated capacity.

20. Would the impact of soft shading, such as air pollution or hard shading, such as bird droppings or weather events, such as snow or ice accumulation, dust, pollen, etc. reduce the energy production of the proposed project? If so, was this included in the proposed projects capacity factor and/or loss assumptions?

    All forms of shading and soiling, including snow and other events, have been included in our energy estimates and have been incorporated into the above capacity factor of 20.8%.

21. Would the power output of the solar panels decline as they age? If so, estimate the percent of loss per year.

    Yes. GRE has assumed a linear loss of 0.5 % in power output every year.

22. Referring to Petition p. 8, what is the status of the interconnection agreement with Eversource?

    Eversource has completed its distribution impact study and is waiting on the ISO-NE Transmission Study. Once the ISO Study is complete, it is anticipated that Eversource will provide GRE with a draft interconnection agreement.

23. Will the proposed solar system employ a single connection to the utility substation? Should one section of the solar array experience electrical problems such that the section shuts down, will other sections of the system still operate and transmit power to the substation?

Yes, there is one main point of interconnection leaving the Site, which is at the entry drive off of Oil Mill Road. The system within the Site is divided into eight (8) sections, which each can be shut down without impacting the other seven (7).

24. Referring to Petition p. 8, provide more detail/drawing for the "utility runs" that interconnect the site with the substation.

    A drawing for the utility side of the interconnection does not exist at this time. The referenced "utility runs" is the Eversource-owned distribution feeder that that proposed solar project will connect to. The distribution feeder will connect to the appropriate substation. At this time, the Impact Study and the Facilities Study that details what Eversource will need to either install or upgrade has not yet been completed. However, all work associated with the utility side of the interconnection will be performed by and managed by Eversource.

25. Is the project being designed to accommodate the potential for a future battery storage system? If so, please indicate the anticipated size of the system, where it may be located on the site, and the impact it may have on the PPA.

    No battery or other storage is proposed for the Project at this time. No studies have been done to-date assessing the impact of including battery storage in project design.

26. Could the project be designed to serve as a microgrid?

    In theory, all solar projects can serve as a microgrid from a technology perspective. This specific project is approved for interconnection with Eversource's power grid and thus will not be serving as a microgrid.

Site Components and Solar Equipment

27. Referring to Petition p. 6, provide the following information regarding the Project solar panels:

    a) What is the anticipated size of the panels?

       The anticipated panel wattage is 370w, with dimensions of 39.1"x77" (see attached Specification Sheet, which is included in these responses as Exhibit E). The current layout depicts these modules to be orientated two panels high in portrait configuration.

    b) What is the efficiency of the solar panels?

       As is depicted in the Specification Sheet referenced above, the anticipated panel efficiency is 19.1%.

    c) What is the minimum and maximum overall height of the panels above grade?

The minimum dimension at the front leading edge is 3’-0” from grade. At the rear of the row, the maximum dimension is approximately 9’-6” above grade. (Please refer to diagram on sheet DN-1 for more information).

d) Provide a specification sheet if the panel model has been selected.

A specification sheet has been provided as Exhibit E, however, that is only an indicative specification sheet. The final selection of panels has not yet been determined, but is anticipated to be determined by the time the Petitioner submits its D&M Plan, should this petition be approved.

28. Referring to Petition p. 6, the panels will be mounted on steel racks with either concrete ballast supports or driven posts.

a) Will the determination be made to use either ballast mounts or driven posts based in daily in-field conditions infield or on pre-construction geo-tech data?

GRE has performed a geotechnical investigation, which was used in identifying that varying conditions are anticipated on this site. We anticipate that the determination of the post installation will be done during construction by the Installer, with guidance provided by the Developer and Engineer.

b) What depth to bedrock will determine what type of foundation (driven posts, screw piles, ballasts) will be used?

Driven posts typically require a minimum of approximately 6 to 8’ of embedment in soil to be effective. When cobbles and boulders are encountered, screw anchors can be effective, and generally require 5 to 6’ of embedment. Shallow bedrock, where required embedment cannot be achieved, will likely endorse the use of precast ballasted posts.

c) What is the maximum grade for the safe installation of the ballast mounts? Would an area of excavation be required under each mount to create a level surface?

The precast concrete ballast would be set on level ground, created by local grading at each post to level the area.

d) What is the length of the driven posts and to what depth would the posts be driven into the ground to provide the required structural stability?

Depending on the racking vendor, the post height will vary due to differing post layout dimensions. However, the basis of design anticipates posts spaced roughly at 12’-0”oc with posts approximately 7’ out of the ground and 7’ embedment (14’ total length). Please refer to sheet DN-1 for additional information.

e) Are residential areas abutting the proposed site served by private wells? Can vibrations caused by driven installation of the posts cause sediment buildup or other negative effects on nearby wells?

GRE is unaware of the source of drinking water for the residences in the area. However, given the distance between where the post driving activity will take place and the nearest residences, the driving of the anticipated racking posts should not create any appreciable vibrations that will affect any existing wells, if such wells are present.

f) How many panels will each rack hold?

As described above in the response to Interrogatory 27a, the current basis of design utilizes titled panels two (2) high and running continuous in the east-west direction for approximately 150 feet before a small break occurs in the racking for maintenance purposes. Pease refer to the diagram on sheet DN-1 for additional information.

g) Provide a specification sheet if the rack system model has been selected, or, if the exact model has not been determined, a sheet for a similar system currently available.

While the racking vendor has not been selected yet, the basis of design for the racking was RBI Solar, and their brochure is included with these responses as Exhibit F.

29. Referring to Petition p. 7, is the wiring for the panels to the string inverters installed on the racking? If wiring is external, are there any concerns regarding damages related to weather, vegetation maintenance, animals?

Yes, the inverters and string wiring from the panels are wired underneath the panels and along the racking. The wires are strap-tied at certain intervals consistent with code requirements and industry standards. When such a system is used on similarly-installed projects, we are unaware of any issues with the types of damages referenced above.

30. Referring to Petition p. 7, provide a description of the route/type of installation of the electrical conduit connecting the string inverters to the transformer pads and the transformer pads to the utility run. If areas of bedrock are encountered, how will the electric conduit be installed?

The design intent for the wiring from the string inverters is to run down the nearest post in rigid conduit and run in a prepared trench underground to the appropriate electrical distribution panel location. The wiring from the distribution panels to the pad-mounted switchgear and to the transformer pads will also be run underground in a prepared trench via conduit. Please refer to PV-1a through PV-1d for diagrams. Where rock is encountered, rock removal will be necessary to install the trench. No overland wiring/conduit is being proposed. Detailing of these described items will be included in

the D&M Plan, if the Petition is approved. In addition, specific details, including for the condition with trench in rock, have been provided on Drawing DN-2.

31. If bedrock is encountered in perimeter fence installation areas, how would the fence post be installed? How will equipment access these areas? What equipment would be used to install the fencing in the steep slope perimeter areas?

    If bedrock is encountered, the proposed fences shall be installed per the Chain Link Fence Detail located on the sheet labeled "DN-1". Construction means and methods shall be determined by the Site Contractor. Sheet DN-1 is included as Exhibit G to these responses.

32. Referring to Petition p. 8, 3.3.5 Fencing, how many solar arrays entry point gates are there?

    Updated site plans depict gates at outfall(s) near each pond and/or for maintenance access. The total number of gates is three (3) double-swing gates and eighteen (18) single-swing gates.

Public Safety

33. If there was an operational issue in one section of the solar field, can this section be disconnected at the inverter location so that the remaining sections can still produce power?

    Yes, each transformer section depicted on sheets PV-1a through PV-1d can be individually shut down without impacting production of other sections.

34. Would the project comply with the National Electrical Code, the National Electrical Safety Code and any applicable National Fire Protection Association codes and standards?

    The Project will be designed to comply with applicable codes and standards, including the National Electrical Code ("NEC") and the National Electrical Safety Code. Regarding compliance with National Fire Protection Association ("NFPA"), GRE intends to apply for a code modification to utilize the 2018 NFPA 1 section 11.12.3.2, in lieu of the current 2012 version, as it recognizes "Vegetation Management Plan" as an alternate to "non-combustible base" under and around solar arrays. The intent of this modification is to balance the stormwater management and soil stabilization with the fire prevention considerations for these facilities.

35. Where is the nearest airport and/or airfield? Would glare from the solar arrays have any impact on air navigation? Has a glare analysis been conducted? If not, under what circumstances would a FAA glare analysis be required?

The closest airport is 7.5 miles away in New London. The Site is located more than two (2) miles from the nearest airport, so the FAA does not require a glare study.

36. Are there any existing or proposed outbuildings, structures, etc. that could present a hazard to the solar facility equipment or interconnection route?

    No.

37. In the event of a brush or electrical fire, how would the Petitioner mitigate potential electric hazards that could be encountered by emergency response personnel? How would the entire facility be shut down and de-energized in the event of a fire?

    There are two (2) redundant switches that will shut off all power to the Site that can both be used in case of an emergency. Additionally, the utility company has the independent ability to shut off grid power in the event of an emergency. Finally, it should be noted that as soon as there is no grid power, the inverters will turn themselves off.

Environmental

38. What is the average depth to groundwater at the proposed project site?

    It should be noted that it is anticipated that additional geotechnical work will be pursued if this Petition is approved to gain additional detail in support of the Project for the preparation of the D&M Plan. With that having been said, based on the geotechnical work that has already been completed, the depth to groundwater at the Project Site varies from at surface to a depth of thirteen (13) feet where it was encountered. It should be noted that in several cases there were borings that did not encounter groundwater.

39. Is the project located within a DEEP-designated aquifer protection area?

    No.

40. Referring to Petition Tab C, page 7.

    a) Does the referenced 750-acre contiguous block of forest represent only core forest or both edge forest and core forest?

       The referenced block consists of both edge and core forest.

    b) Provide an aerial photograph that depicts pre- and post-construction edge and core forest with associated acreage of each.

       Aerial footage with harvest complete is not available, as the harvest is still ongoing. However, GRE is in possession of aerial photographs that were taken during the timber harvesting activities. These photos are included as Exhibit H to this response. It is GRE's understanding that, as of this date, approximately seventy-five (75) percent of the trees have been harvested.

c) What is the anticipated impact on interior forest dwelling birds that use this existing identified core forest area?

As noted in the Davison Environmental report section 4.2, excerpted below:

"The total limits of tree clearing are 90 acres. The resulting habitat loss will render the site largely uninhabitable for forest-dwelling birds. Beyond the areas converted from forest to solar field, forest within approximately 300-feet of the proposed clearing limits will be diminished with respect to supporting forest-dwelling birds because of the impacts associated with the edge affect. Additionally, the overall 750-acre forest block will be fragmented, and the habitat value diminished. This is exacerbated by the fact that the site lies roughly within the center of the overall 750-acre forest block, which will have a particular affect on the portions of the forest block that lie to the west (west of the site towards I-95, north to Oil Mill Road) as this area will be fragmented into a small forest patch less than 100 acres."

d) How might this Project impact the abundance and distribution of migratory and interior forest nesting birds?

As described in the Davison Environmental report section 4.2, the value of the core forest for interior forest-nesting birds will be diminished as the overall size of the roughly 750-acre core forest block will be reduced. The reduced forest block size will likely reduce the local population size of some forest interior bird species, simply by the fact that less habitat will be available for nesting and territory establishment. To quantify the actual effect to nesting birds, a pre-construction and post-construction nesting survey would need to be conducted.

With respect to migratory birds, the value of this Site for migratory birds will likely be diminished, again due to the loss of available habitat. Due to the geographic location of this Site near the coastline, there is the potential for larger concentrations of migrating birds (spring and fall migrations) as the Connecticut coastline attracts larger concentrations of migrants than most inland areas of the state. To assess the actual impact on migratory bird use, a pre-construction and post-construction migratory bird survey would need to be conducted.

e) How are the stated changes to core forest as a result of project construction consistent with the statement made on Petition p. 23 *(…the Project will not alter areas of prime farmland or core forest.)*

As indicated in the Ground Lease that has been provided to the Council, the timber harvesting on the Site has taken place as a result of the activities of the current landowner. The effects on the habitat in the area will occur, and for the most part have occurred, regardless of whether the Project is constructed.

f) Referring to p. 11, has the current logging activity by the property owner altered the characterization that the Project site is in the middle of a 750-acre contiguous block of forest?

Yes.

41. Would there be any coordination between the commercial logging company and the Petitioner in regards to further site clearing for the Project and/or utilizing the existing logging skid paths?

GRE does not anticipate any coordination between the commercial logging company and GRE with respect to further site clearing for the Project. However, GRE would note that it is GRE's understanding that the regulations associated with the stormwater impacts from logging activities do not require the same level of stormwater flow protection as are found in the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, which the Project would be subject to. GRE does anticipate utilizing at least some of the existing logging skid paths in its construction of the Project. If it does so, GRE anticipates that it will be responsible, under the terms of the General Permit, for the stabilization of such skid paths to ensure appropriate limits to stormwater discharge.

42. Does the Petitioner intend to harvest the remaining trees within the Project area for commercial purposes or chip on-site for re-use? Given the recent logging activities on the property by the property owner, will tree removal and/or grubbing for the Project be phased or will it occur in one distinct operation?

GRE does not intend to commercially harvest any trees. All commercial harvesting is the responsibility of the landowner and GRE is not involved in this activity. Any remaining trees or stumps that need to be removed for the Project will be chipped on site for re-use. All civil work, including grubbing and tree removal, if needed, will be phased in accordance with the larger phased construction plan for the Project.

43. Provide the carbon debt payback period in years (or days) using the formula below with U.S. EPA data.

Carbon Debt Payback in Years =

$$\frac{(Acres\ of\ trees\ to\ be\ cleared)(0.85\ MT\ CO2\ per\ acre{-}year)(Service\ life\ of\ facility\ in\ years)}{(Annual\ Energy\ Production\ in\ kWH)(7.44\ x\ 10{-}4\ MT\ CO2\ per\ kWH{-}year)}$$

Although GRE anticipates that the Project will have a longer useful life than twenty (20) years, for purposes of this calculation, GRE has used a conservative estimate of a twenty (20) year life of the facility for this calculation. As such, the calculation would proceed as follows:

Carbon Debt Payback = (25 acres)(.85)(20 years)/((30,473,000 kWh)(7.44X10^-4))
Carbon Debt Payback = .019 years

44. Referring to Petition p. 8, provide a diagram that shows areas of clearing necessary to prevent shading of the solar arrays. Will stumps be left in place in these areas? How were the limits of tree shading determined?

    The shade buffer is depicted in drawings EXH-0.0 through EXH-0.. Areas where stumps are to remain are depicted in Drawing EXH-2. These drawings are enclosed with these responses as Exhibit I.

45. Referring to Petition p. 8, does the 90 acres of clearing include stump removal/grubbing? If not, how many acres would require grubbing?

    This information is provided in Exhibit I. It should be noted that not all of the ninety (90) acres that were commercially harvested for logging will be subject to stump removal or grubbing for the Project. Those areas that are not contemplated for project construction will not be subject to stump removal or grubbing.

46. Referring to Petition Tab C, page 5. One state-listed species, the eastern ribbon snake, was identified on-site.

    a) Was this observation reported to the Department of Energy and Environmental Protection (DEEP) Natural Diversity Database program?

       Yes, a Special Animal Survey Form (SASF) was prepared and submitted, and email confirmation of receipt of the form was received from Dawn McKay of the CT DEEP on August 1, 2018.

    b) Would the recent on-site logging activities by the property owner within and adjacent to wetlands/wetland buffer areas enhance ribbon snake habitat?

       The observation of the single ribbon snake was incidental during vernal pool surveys and was not part of a comprehensive survey. Therefore, we do not have detailed knowledge as to how the species uses the Site. Based on the known habitat preferences of this species, improvement of habitat because of logging is possible, because ribbon snakes favor open canopy areas. As shrubs and sapling trees begin to regenerate, such early-successional woody habitats may become more suitable for ribbon snakes. This is provided that hibernacula have not been affected.

    c) What measures, if any, are being taken to protect the eastern ribbon snake during construction beyond establishing a proposed 200-foot wide wetland buffer zone from the solar panel area?

       Davison Environmental did not recommend protection measures for the eastern ribbon snake. Because the species is highly mobile and can move away from active construction, protection measures are typically not proposed, and Davison Environmental is not aware of any standardized protection measures for this species. While it is possible that snakes could be located within the active construction zone

when work begins, provided that there are periodic breaks in the perimeter erosion controls (i.e., silt fencing), animals will be able to move outside of the work areas.

47. If applicable, would the Petitioner comply with any DEEP recommended seasonal construction restrictions due to the presence of any protected species on the Site?

    GRE is currently unaware of any recommended seasonal construction restrictions due to the presence of any protected species on the Site. If, however, such restrictions were recommended by DEEP as the result of the presence of such species, GRE would comply with such restrictions.

48. Would glare from the solar panels attract birds (ex. appear as water) and create a collision hazard? Are there any studies in the northeast regarding glare and avian mortality for ground mounted solar arrays in the northeast?

    Bird mortality at solar farms has been documented by the U.S. Fish and Wildlife Service, with the presumptive cause being the so-called "lake effect" where water-dependent species fly into the panels or ground as they mistake the array field for open water. The impact seems most prevalent with Concentrated Solar Power Facilities utilizing mirrors but is noted at large scale PV sites. We are aware of this occurring at sites in California, but we could not find any literature documenting this effect at sites in New England. Additionally, we are unaware of any such post-construction monitoring studies ongoing in Connecticut.

49. Is the site within the range of the Northern-long eared bat? If so, would any proposed tree clearing occur within 0.25 miles of a known northern long-eared bat hibernaculum or within 150 feet of a known occupied maternity roost tree?

    Yes, based on the latest U.S. Fish and Wildlife Service's Endangered Species for Connecticut (updated 2/5/2016), the Site is within the range of the northern long-eared bat. Based on the northern long-eared bat areas of concern in Connecticut to assist with Federal Endangered Species Act Compliance mapping dated February 1, 2016, the Site is not located near any known hibernaculum or maternity roost trees.

50. What is the Town's regulated buffer zone from wetland resource areas?

    100 feet.

51. Referring to Petition Tab C, p. 9, the recommended buffer zone from a wetland area is 200 feet for solar arrays and other non-pervious surfaces. Would a compacted gravel road be considered a non-pervious surface?

    For stormwater calculations, the gravel roads are seen as pervious, but were modeled with the appropriate curve number(s) as required for this surface. The statement in the petition was referring to panels or paved drives.

52. Why do Site Plan sheets SP-5 and SP-8 utilize a 150-foot wetland buffer (*50-foot no disturbance, 100 foot selective disturbance)* whereas the remaining Site Plan sheets utilize a 200-foot buffer *(100-foot no disturbance, 100 foot selective disturbance)*?

    GRE used these buffers as a result of a recommendation from Davison Environmental based on proximity to environmentally-sensitive areas. Clearing buffers for vernal pool areas are presented on drawings EXH-3.1 and EXH-3.2, that are included as Exhibit J to these responses.

53. Does the solar field layout on Sheet SP-5 and SP-8 conform with the 200-foot wetland buffer recommendation listed in Petition Tab C, p. 9? If not, can the site plan be altered to conform?

    The recommendation listed should have been 200-foot in most areas, with 150-ft wetland buffers in isolated areas per the recommendations from Davison Environmental (although not described in the Davison Report). These areas identified SP-5 and SP-8 were designed utilizing the 150-ft wetland buffer, as these drainage areas were already historically modified in the Eversource Right-of-Way to be diverted from direct pathways to the adjacent wetlands.

54. Describe the existing logging road crossing of Wetland 1. What upgrades of this Crossing are necessary to both facilitate access to the solar field and protect existing wetland resources?

    The Crossing has been improved by the entity responsible for the commercial logging currently being undertaken at the Site. It is understood and believed that there is an existing culvert under the Crossing. It is GRE's understanding that when the logging is completed, the logging operation will be compelled to restore the culvert to what it was before the logging activity. GRE is still evaluating this situation, however, it is GRE's contemplation that GRE, if feasible, would consider further stabilization of the Crossing with gravel, geo-grid or other means. Final upgrades cannot be determined at this time. GRE will have to wait until the completion of logging activities and restoration before it can evaluate any needs to address this situation.

55. Referring to Petition Tab C, p. 10, Impacts to Wildlife and Habitats:

    a) Provide an aerial photograph of the site that depicts the solar array layout and the location of the vernal pools, and 100-foot and 750-foot buffers around each pool to represent the Vernal Pool Envelope (VPE) and Critical Terrestrial Habitat (CTH) zones. What percentage of the VPE and CTH of each vernal pool is developed pre and post-construction?

       This requested information pertaining to the vernal pool buffers is provided on drawings EXH 3.1 and 3.2, which are included as Exhibit J to these responses.

b) What, if any, project development activities would occur within the VPE and CTH areas? Are any construction restrictions recommended to protect vernal pool functions and values and obligate species?

Until the final construction plans are completed, it is premature to state with certainty what project development activities would occur within the VPE and CTH areas, if any. GRE will consult with Davison Environmental, and it is anticipated that Davison Environmental will provide GRE with suggested restrictions. GRE anticipates providing such restrictions to the Siting Council as part of the D&M Plan process, if this Petition is granted.

Facility Construction

56. What dataset was used to obtain the topographic information provided on the Project drawings?

The topographic information was compiled first by doing an on-site survey of the property boundaries. The wetlands on the property were delineated on-site by Davison Environmental and GPS coordinates for the wetlands at the property were provided by Davison Environmental to BL Companies for incorporation into the Project drawings. Aerial topography of the Project site was completed by Golden Aerial Surveys and also provided to BL Companies. The resultant combination of that information resulted in a survey that has a T-3 level of accuracy, as referenced in the relevant Project drawings.

57. What is the proposed minimum/maximum grade of the solar field area?

The minimum grade is zero (e.g. at top of a hillock) and varies to twenty (20) percent within the solar field(s). Additional detail can be obtained from Sheet EXH-1, which is enclosed with these responses as Exhibit K.

58. Would the solar rack support ballasts be cast on-site? If so, indicate the location of the ballast mold area and concrete wash out station. Provide a design detail of the concrete wash out station. If not, would the Petitioner construct them off-site or purchase from a concrete vendor?

The solar ballasts will not be cast on-site. To the extent that ballasts are required for this Project, the decision as to where to source such ballasts would be made by the EPC contractor, but the EPC contractor has not yet been selected. The Petitioner would be willing to provide additional information concerning the sourcing of ballasts as part of its D&M Plan submission, should this Petition be granted.

59. Has a comprehensive geotechnical study been completed for the site to determine if site conditions support the overall Project design? If so, please provide. If not, has the Petitioner anticipated and designed the Project with assumed subsurface conditions? What are these conditions?

Yes, a geotechnical engineering report that identifies overall site conditions was conducted for this project in May of 2018, and a copy of this report is enclosed with these responses as Exhibit Q. Now that the proposed site features have been laid out, GRE will perform additional soils investigation in more specific areas, such as stormwater ponds and access road fills. These further studies will identify exact soil, rock and groundwater characteristics at each location, which will assist in the final design and detailing of these site features.

60. Will blasting be required to install site infrastructure? If not, what methods would be used if bedrock is encountered? If so, how would blasting affect stormwater drainage calculations and the proposed stormwater controls?

    GRE does not anticipate any blasting to be undertaken at the Site. When construction documents are completed, the specifications will reference that rock will be removed by mechanical means.

61. If site clearing and construction work is conducted during winter months, what additional erosion and sedimentation controls would be deployed to control potential accelerated runoff due to frozen or partially frozen ground?

    There are no additional erosion and sedimentation controls that would be anticipated to be deployed in the winter months. It is believed that the existing erosion and sedimentation controls were designed with adequate protections for activities that may take place during the winter months.

62. Petition p. 8 states initial work involves clearing and installation of E&S controls, including basins. In what order would these three steps occur?

    The description in the Petition was simply a high-level sequence. The anticipated steps are described in more detail in the Stormwater Pollution Control Report starting on page 6, which begin with the installation of erosion control measures, followed by the installation of temporary sediment ponds.

63. Petition Vol. 3, p. 2 mentions the use of silt fence. Have other perimeter controls been examined such as compost filter sock or a combination of both in construction areas adjacent to wetlands?

    Additional protection will be provided with the installation of composite filter sock upgradient of the onsite wetlands. Please see sheets EC-17 and EC-18, enclosed with these responses as Exhibit L, for additional information.

64. Referring to Petition pp. 9&10, Section 3.5 - Construction schedule and sequencing*: Land preparation and site work is anticipated through the end of fall 2019, with the final installation of array equipment in fall of 2019. Final site stabilization, testing and commissioning are expected to be completed in late fall of 2019.*

a) Construction Schedule on p. 10 is inconsistent with the written narrative. According to the construction schedule, commissioning is to occur in second quarter of 2019. Which is correct?

The schedules, either in narrative form or by table, were developed as a high-level depiction of the intended course of action with the information that was available at the time. Until approvals are received, construction drawings are completed, and a contractor is selected, the actual schedule cannot be finalized. However, the schedule narrative and the table can be revised to eliminate the inconsistencies, should the Council so desire.

b) Based on the construction schedule, site work is to start in March 2019. How would erosion and control measures be installed under possible snow conditions and frozen ground? How might this impact sedimentation issues both on-site and off-site?

The exact date for site work start will depend on when ground unfreezes. Grading will not happen while the ground is frozen.

c) Sediment and Erosion Control Notes, on Site Plan EC-17 states "The anticipated starting date for construction is spring 2019 with completion anticipated spring 2020. Please explain timeline discrepancies.

The goal is to start construction Spring 2019, and complete construction in 2019. Exact start dates and timing will be dependent on permit approvals as well as utility timelines for interconnection. The Project Schedule cannot be fully finalized at this time. A more detailed construction timeline can be provided as part of the Petitioner's D&M Plan, should the Council so desire.

d) Does the project construction schedule account for seasonal wildlife restrictions, temporary site stabilization, phased implementation of stormwater controls, and weather delays?

Yes.

65. Referring to Petition Vol. 3, SWCP Section 2. Construction Sequencing:

a) According to Table 2, p. 8, there could be as much as 4-6 weeks between the time Crew 4 completes a phase of the project and Crew 7 begins soil stabilization practices. How will the site be stabilized during this 4-6 week timeframe? What erosion and control measures will be utilized during this transition period?

As stated previously, the Schedule was developed to identify global courses of action. The actual timelines and durations will be refined when the documents are complete and a contractor is selected. It is not the intention to leave any disturbed

areas unstabilized for any appreciable duration, and the final schedule will reflect this.

b) The construction schedule indicates approximately 42 weeks of activity. What 10 weeks of the year are not expected to be active construction periods?

The construction schedule included on p. 8 was developed solely for the purposes of illustrating sequencing of the design intent. It is not intended to replace or contradict the schedules in the Petition or the final schedule once a contractor is selected. All schedules will be coordinated prior to the contractor applying for a DEEP stormwater permit during construction.

c) Provide detailed information regarding the composition/mesh type of the erosion control blankets to be utilized on-site.

All erosion control blankets shall be composed of biodegradable/ photodegradable natural netting or mesh per the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

66. Referring to the EC series Site Plans, what symbol delineates phase boundaries? Some of the Site Plans show work outside of a phase boundary (ex. EC- 7, EC -11), what phase would this work occur in? Using Site Plan EC-0, please divide the plan into four sections for ease of review. Place phase boundaries on the plan using the phasing schedule described in Petition Vol. 3 SWCP.

This information is included in the drawings labeled "EC-0.0" through "EC-0.4," which are included with these responses as Exhibit M.

67. Referring to Site Plan EC-17, Construction Sequence:

a) Note 12 states inspections of erosion control measures are to be conducted weekly or after rainfall exceeding 0.25 inch. Why are inspections not specified prior to forecasted rain events? Additionally, would inspection of erosion controls during heavy rain events be prudent to ensure erosion controls are not failing, causing downgradient, and potentially off-site deposition of sediment?

Erosion controls are installed and routinely inspected and maintained as needed throughout the Project. Weekly inspections serve the purpose of inspections "prior" to a possibly forecasted event.

b) Note 18 & 19 discuss temporary seeding followed by solar racking and panel installation. What is the time interval between these two tasks? How will seeded grasses be maintained to provide temporary soil stability and infiltration if these newly stabilized areas will be subsequently impacted by vehicles and construction equipment used to install the racking and solar panels?

The timing determination will be made once a final construction contractor has been selected; however, the timing interval will be as short as possible to limit any periods of time where the Site is not stabilized. Other temporary measures, such as the installation of tackifier or matting, may be implemented if necessary.

It is anticipated that the temporary measures will also be subjected to routine, third party inspections during construction. Any corrective actions that are identified as necessary during such inspections, including supplementing temporary seeded areas in the event that those measures are compromised by efforts to install racking and panels, will be taken.

68. Estimate the amounts of cut and fill in cubic yards for site construction.

Any estimates will be subject to final calculation once a construction contractor is selected. With that having been said, it is anticipated that the proposed grading will generate approximately 22,660 cubic yards of surplus in the form of both soil and rock. This surplus primarily represents surplus from the construction of stormwater ponds and conveyances.

69. Site Plan GN-1, Note 32 is incomplete. Please provide the missing information.

Note 32 has been updated to state "There are wetlands located on the site as indicated by the wetlands / watercourses delineation report by Davison Environmental done in December 2017." A copy of the revised GN-1 is included with these responses as Exhibit N.

70. Referring to the Grading and Drainage Site Plans, provide the following:

a) Describe the composition of the level spreaders and how their locations were chosen.

As has been stated previously, GRE anticipates performing additional geotechnical work on the Site. Pending the completion of this additional geotech investigation, level spreaders are currently depicted diagrammatically and final design and details are anticipated to be provided as part of the construction documents. Should the Council so desire, GRE can include this information as part of its D&M Plan, if the Petition is approved.

b) Plan GD-7 – how would the proposed site grading, road construction and swales be constructed on the eastern side of the Site if large amounts of ledge are encountered?

As has been stated previously, GRE anticipates performing additional geotechnical work on the Site. Pending the completion of this additional geotech investigation, the final design and details of this road installation are anticipated to be provided as part of the construction documents. Should the Council so desire, GRE can include this information as part of its D&M Plan, if the Petition is approved.

c) Plan GD-8 – could the proposed level spreader be designed to more accurately blend in with the existing topography and reflect the contours of the discharge point?

As has been stated previously, GRE anticipates performing additional geotechnical work on the Site. Pending the completion of this additional geotech investigation, level spreaders are currently depicted diagrammatically and final design and details are anticipated to be provided as part of the construction documents. Should the Council so desire, GRE can include this information as part of its D&M Plan, if the Petition is approved.

d) Plan GD-12, 14 & 15 – would the water discharged from site detention features via pipes and level spreaders increase stormwater flows and volume concentrations on abutting properties?

The anticipated discharges mimic pre-construction drainage patterns and flows. However, because the Site does not have infiltration (only detention), there is a corresponding increase in volume to offsite discharges.

e) Some of the proposed stormwater structures are located on property lines. How would erosion and sediment control measures be installed downgradient of the structures located on property lines?

These features are currently depicted diagrammatically and final construction documents will indicate that these features will not be located on the property line. Adequate room will be provided to install erosion and sedimentation control protections at the locations proximate to the property line(s), but with sufficient room so as not to encroach on adjacent property.

f) Why does basin 304.1 (GD-07) require road access from the north and south?

The road provides access not only to the Basin, but also to nearby solar panels.

g) How will vehicles access basin 303.1 (GD-10/11)?

This Basin does not have direct road access; however, maintenance personnel will be able to access these areas by driving vehicles or equipment down the rows of nearby/adjacent panels.

h) Why does basin 100.1 (GD-15) require road access from the east and west?

The road provides access not only to the Basin, but also to nearby solar panels.

i) How is stormwater being collected and controlled from the roadways near basins 304.1 and 101.1?

Stormwater collection and discharge mimics pre-construction drainage patterns and these areas are not being detained. However, compensatory detention is provided elsewhere within the same sub-drainage basin(s).

71. Referring to Petition Vol. 3, SPCP p. 2, the narrative calls for the installation of a gravel drip strip along the leading edge of each solar panel. Provide a site plan detail of the strip.

    GRE did not include the installation of gravel drip strips in its stormwater calculations, and this language was removed from other mentions in the body of the Petition itself. The reference to a drip strip should not have been included on page 2 of the SPCP.

72. How will detention basins located on bedrock promote stormwater infiltration? Are the runoff calculation's based on an empty detention basin? If there is little infiltration, how can the stormwater control system handle multiple short duration, high precipitation storm events?

    Detention basins were not designed to provide infiltration – their performance is predicated on being empty and are designed per requirements and not for other hypothetical storm frequency(ies). Pending additional geotech investigation, stormwater basins are currently depicted diagrammatically and final design and details are anticipated to be provided as part of the construction documents. These details can be provided as part of the D&M Plan for the Project, if this Petition is approved.

73. Petition Vol. 3, Stormwater Management Report p. 3 states the discharge of basins would be onto rip rap, level spreaders, or through overland flow. What are the determining factors as to what discharge method to use? Provide construction detail for the level spreaders and rip rap outfalls.

    Discharges were selected based on existing and proposed conditions and grades. Pending the completion of this additional geotech investigation, level spreaders are currently depicted diagrammatically and final design and details are anticipated to be provided as part of the construction documents. Should the Council so desire, GRE can include this information as part of its D&M Plan, if the Petition is approved.

74. The stormwater controls are focused on retaining stormwater at the perimeter of the site using various basins and swales with discharge at or near the property boundary. Have additional provisions for stormwater control been contemplated to intercept and reduce stormwater velocity, promote infiltration, and minimize mobilization of soil in more interior areas, to lessen the reliance of long swales and large basins at the Site perimeter?

    The proposed stormwater controls have been designed to meet regulatory requirements – the Design does not promote infiltration. Pending additional geotech investigation, check dams along swales may be incorporated to further reduce stormwater velocities as part of the final design and details are anticipated to be provided as part of the construction documents. Should the Council so desire, GRE can include this information as part of its D&M Plan, if the Petition is approved.

75. Petition Vol. 3, p. 24, what is a “low-malignance” seeded area?

    The landscaping plans for the Project refer to this “low-malignance” seeded area as Conservation Seed Mix. For more information on this issue, please refer to the LL Series Plans, which have previously been provided to the Council in Volume 2 of the Petition.

76. How does the developer intend to promote and maintain grasses or other ground cover beneath the panels and within the solar array rows? Would bare ground areas or patchy growth increase site runoff and thus necessitate additional stormwater volume control?

    Upon completion of general project construction, the disturbed area will be permanently re-seeded with the correct seed mix for low growth grasses and/or flowers. The seed mix will be water or hydroseeded appropriately for the conditions at the time of seeding. The Project will ensure that the grass mix establishes, and will be designed to require no additional irrigation after establishment. The stormwater calculations were conservative and assumed that not all of the area would be grass so that no additional stormwater measure would be needed for patchy ground.

77. Using the Overall Grading and Drainage Plan- GD-0 – Please divide the plan into four sections for ease of review. If possible, place arrows on the plan indicating the proposed direction of stormwater flows.

    This information has been placed on the GD series of documents, labeled “GD-0.0” through “GD 0.4,” which are enclosed as Exhibit O to these responses.

78. Site Plan C-1 depicts “native shrub plantings”. Will plantings be installed in these areas or will these areas only be seeded?

    The native shrub planting described within CS-1 is noted as Upland/Shrub Seed Mix within the Landscaping Plans. This includes New England Roadside Matrix Upland Seed Mix and Shrubs. Sheet CS-1 has been updated to clarify, and a copy of this updated sheet is provided as Exhibit P. The previous Native Shrub Plantings shall mean Upland/Shrub Seed Mix.

79. Referring to Petition Vol. 3, Stormwater Management Report p. 33:

    a) provide a schematic of the perimeter solar array stormwater buffer system to be used. Will this buffer system be implemented around the entire project perimeter, including roads and basin areas?

       Please refer to the Landscape Plans (LL-1 through LL-16) for a depiction of buffer areas identified as conservation seed mix for the project. The perimeter areas of the site outside of the solar array system include a variable width stormwater buffer area

to enhance or preserve pollutant removal and provide buffering to the adjacent properties.

b) explain why it is recommended that "water quality volume and attenuation" be waived for the Project.

The rationale is that the design has no modeled impervious surfaces for this Project. As such, GRE is unable to calculate or generate such a volume per the guidance manual.

80. Has the Petitioner consulted with DEEP regarding the stormwater control plan? If so, when? Were any recommendations from DEEP incorporated into the plan?

Representatives of GRE met with DEEP stormwater permitting staff on May 2, 2018. Certain recommendations from DEEP staff were discussed; however, DEEP staff indicated that until a final contractor was selected and construction drawings were finalized, DEEP could not give meaningful, specific recommendations concerning the stormwater control plan. That having been said, DEEP did indicate that, if designed correctly, the Project could be completed in multiple, simultaneous phases that were not hydraulically linked. In addition, DEEP staff encouraged the Petitioner to look at undertaking the development of smaller ponds, but potentially using more of these smaller ponds to handle stormwater runoff. GRE appreciates these comments and intends to incorporate them in the project's D&M Plan, should the Petition be approved.

81. Is the stormwater control plan at concept plan or is it in its final form, to be submitted as part of the DEEP General Permit? If the plan is conceptual, in what areas can solar panels be installed if there are additions or relocations to the stormwater system that require space in the current proposed solar array area?

Please see the response to Interrogatory 80. In addition, if there are additions or relocations to the stormwater system that require space in the current solar array area, GRE will evaluate and address such concerns as part of its D&M Plan, if the Petition is approved.

82. Can the project be constructed to conform with the attached guidance from DEEP entitled, "Stormwater Management at Solar Farm Construction Projects", dated September 8, 2017?

Yes. The Project is anticipated to be constructed in accordance with the September 8, 2017 DEEP Guidance.

83. Please respond to the Town of Waterford's comments submitted to the Council on July 18, 2018.

The Applicant will review the proposed development clearing limits with regard to vegetative screening and can make adjustments accordingly as requested.

The Applicant recognizes the importance of protecting the sensitive environmental resources on site, as well as the Niantic River watershed, and the potential impacts that this development may have. During the construction period, stormwater runoff will be handled in accordance with the Connecticut Guidelines for Soil Erosion and Sediment Control as illustrated on the project sediment and erosion control plans and narrative. Post-construction final design of the stormwater management system components will include elements designed in accordance with the Connecticut Stormwater Quality Manual and are intended to protect identified environmental resources and to mitigate long-term impacts. The design intent is to provide stormwater management systems that provide for maximum infiltration of runoff, attenuation of potential thermal impacts and reducing the potential for sediment and nutrient loading to downstream resources.

As alluded to elsewhere in these responses, additional geotechnical field testing will be required prior to final design in order to determine soil infiltration rates, depth to groundwater, and depth to bedrock. The results of this study will inform the final stormwater design with respect to the collection, attenuation, infiltration, and discharge of runoff. Some proposed stormwater basins and outlets may need to be modified pending the results of additional field testing.

The specifics of the final design will be reviewed by a third party, prior to construction, in accordance with the requirements of the CTDEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. In addition, the permit requirements specify the preparation of a Storm Water Pollution Prevention Plan (SWPPP) which will address operation and maintenance of the post-construction stormwater management system. It is anticipated that third-party monitoring of the general contractor will be provided during construction to identify and proactively resolve erosion control issues before they arise.

Maintenance Questions

84. Petition p. 13 mentions an Operations and Maintenance (O&M) Plan. Has a preliminary O&M Plan been prepared? If so, please submit.

    There is not a specific O&M Plan for this Project that has been created. Greenskies has its own O&M team that both self performs and contracts all required monitoring, maintenance, and repairs in order to keep all of our PV systems fully operational and safe.

85. Would any mowing be required under or around the proposed solar panels/modules, and if so, approximately how often would mowing occur? Would the Petitioner adhere to any seasonal mowing restrictions that may be recommended due to the presence of any protected species?

Mowing may be required and will be executed on an as-needed basis, based upon production monitoring. The solar panel height above ground and seeding mix are intended to minimize the number of times mowing will be required. The Petitioner will adhere to requirements regarding time of year and/or adjustments to blade height.

86. Would the installed solar panels require regular cleaning to remove dust, dirt, bird droppings etc.? How would this be accomplished? Would any chemicals be used or only water? Would this maintenance activity have any impact to adjacent wetlands, watercourses or groundwater?

    Modules will be cleaned on an as-needed basis to maintain production with water only. No chemicals would be used and the water would not have an impact on nearby wetlands or watercourses.

87. Would the petitioner store any replacement modules on-site in the event solar panels are damaged by hail, prey shells or other impact hazards? How would damaged panels be detected?

    Spare equipment will be stored in an offsite warehouse. Damaged panels will be detected on routine preventative maintenance site visits and/or through real time monitoring software.

Respectfully Submitted,
GRE GACRUX LLC

By: Lee D. Hoffman

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EXHIBIT A

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August 10, 2018

Via Certified Mail/Return Receipt Requested

John and Bertha Dewolf
97 Oil Mill Road
Waterford, CT 06385

Re: Connecticut Siting Council Petition 1347 - GRE GACRUX LLC Petition for a Declaratory Ruling, Pursuant to Connecticut General Statutes §4-176 and §16-50k, for the Proposed Construction, Maintenance and Operation of a 16.78 MW AC Ground-mounted Solar Photovoltaic Electric Generating Facility Located on Oil Mill Road in Waterford, Connecticut

Dear Mr. and Mrs. Dewolf:

Pursuant to section 16-50j-40(a) of the regulations of the Connecticut Siting Council (the "Council"), we are notifying you that a subsidiary of Greenskies Renewable Energy, LLC, known as GRE GACRUX LLC has recently filed a petition for declaratory ruling with the Council in connection with the above-referenced project. This petition requests the Council's approval of the location and construction a 16.78 MW AC solar photovoltaic facility to be located in Waterford, Connect ("the Project").

The Project will be located on property located at 117 Old Mill Road, Waterford, Connecticut.

The Project will consist of solar modules, string inverters; distribution level collector lines; electrical subpanels; step-up transformers; security fencing; and access roads. The Project will be interconnected with the local electric distribution system.

A full copy of the Petition has been placed on file with the Town of Waterford. An electronic version of the Petition can also be found on the Council's website by accessing the following link: http://www.ct.gov/csc/cwp/view.asp?a=2397&Q=603418&PM=1. If you have any questions regarding the Project, please contact the undersigned or the Council.

Sincerely,

Lee D. Hoffman

Lee D. Hoffman
Attorney for Greenskies Renewable Energy, LLC

ACTIVE/74725.48/LHOFFMAN/7603259v1

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City, State, ZIP+4® Waterford, CT 06385

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John and Bertha Dewolf
97 Oil Mill Road
Waterford, CT 06385

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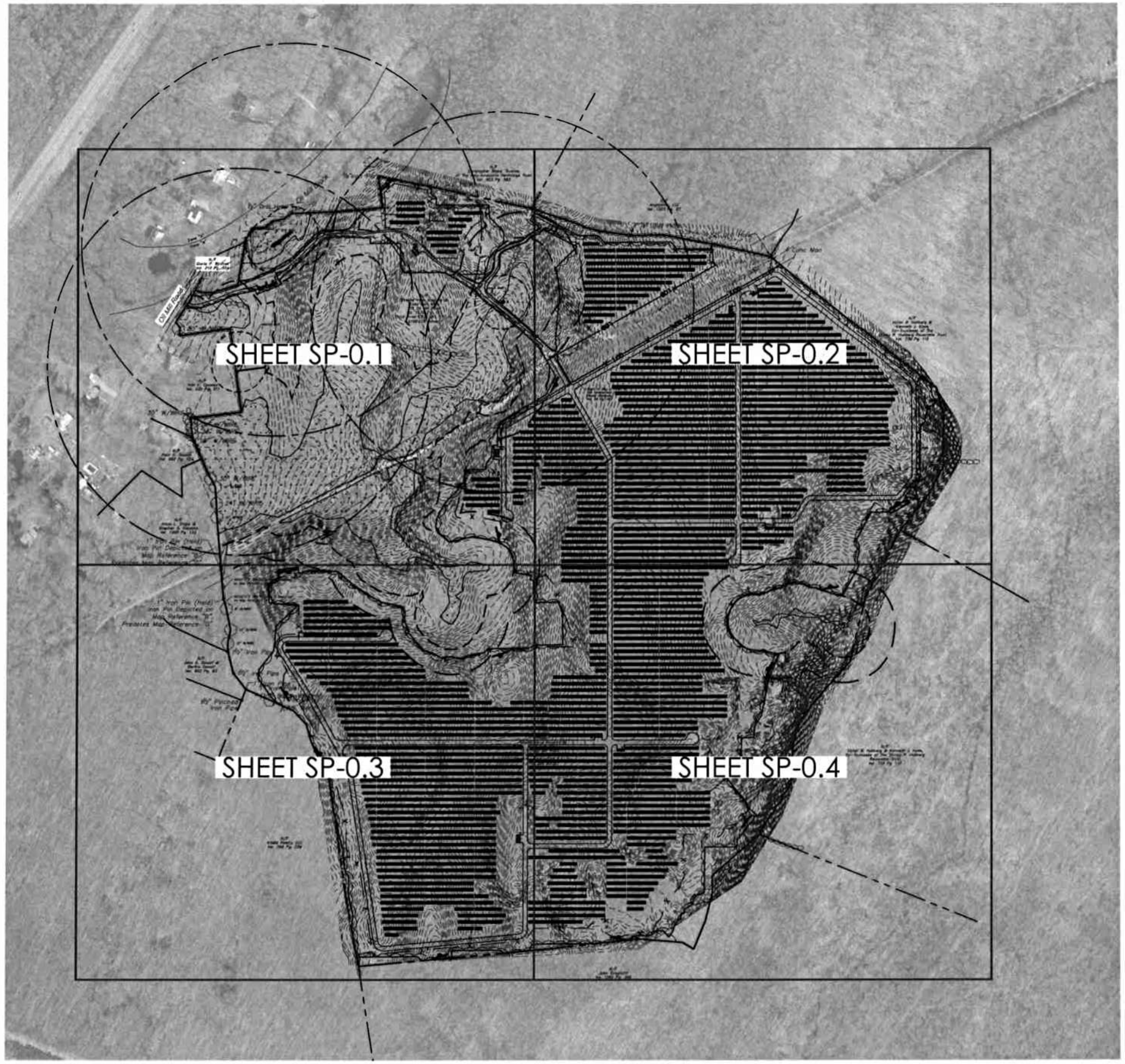
EXHIBIT B



REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

FOR PERMITTING PURPOSES ONLY
NOT RELEASED FOR CONSTRUCTION

GRAPHIC SCALE
200 100 0 200
SCALE IN FEET

Architecture
Engineering
Environmental
Land Surveying
BL Companies
355 Knotch Parkway
Meriden, CT 06450
(203) 630-1475
(203) 630-0415 fax

PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

Designed	H.J.L.
Drawn	H.J.L.
Reviewed	
Scale	1"=200'
Project No.	1703515
Date	07/30/2018
CAD File	SP170351501-QUADRANT

Title
OVERALL SITE PLAN - QUADRANT EXHIBIT

Sheet No.
SP-0.0

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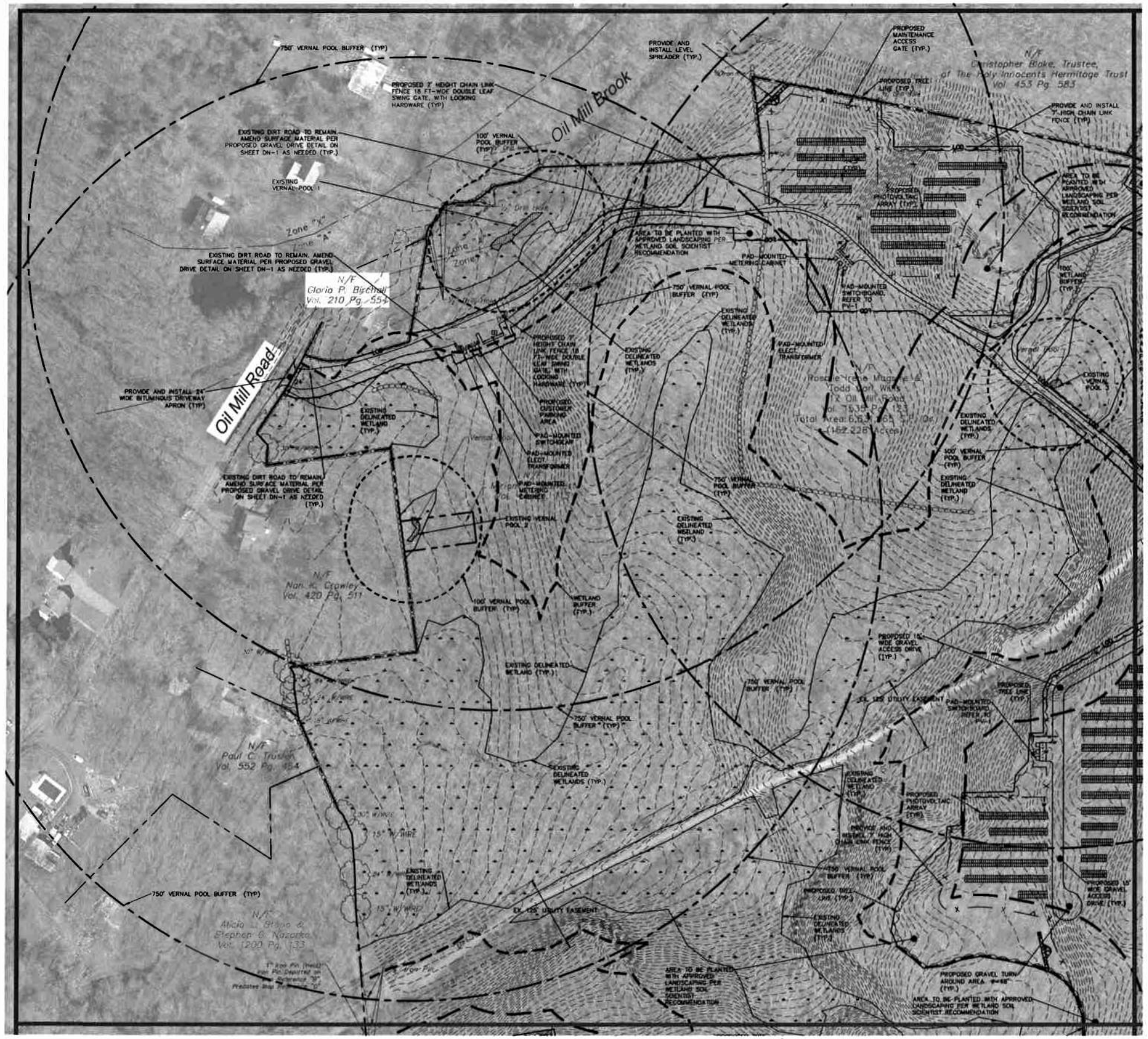

MATCHLINE - SEE SHEET SP-0.3

MATCHLINE - SEE SHEET SP-0.2

LEGEND

- PROPERTY LINE
- EXISTING EASEMENT
- LIMITS OF DISTURBANCE/CONTRACT LIMIT LINE — LOD —
- GROUND MOUNTED PHOTOVOLTAIC (PV) MODULES
- EXISTING WETLANDS
- 50'-100' WETLAND BUFFER (UNDISTURBED)
- 200' WETLAND BUFFER (REFER TO LANDSCAPING PLANS FOR CLEARING LIMITS AND PROPOSED PLANTINGS WITHIN BUFFER)
- EXISTING VERNAL POOL
- 100' VERNAL POOL ENVELOPE (VPE)
- 750' CRITICAL TERRESTRIAL HABITAT (CTH)
- EXISTING DIRT ACCESS ROAD
- BOLLARDS
- CONCRETE PAD (ELECTRIC UNIT)
- PROPOSED GRAVEL ACCESS ROAD
- BITUMINOUS DRIVEWAY APRON
- PROPOSED 7' HIGH CHAIN LINK FENCE — X — X —
- PROPOSED TREE LINE
- FLOW ARROW

GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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855 Research Parkway
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(203) 639-1405
(203) 639-0613 Fax

PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

REVISIONS
No. Date Desc.

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=50'
Project No. 170351S
Date 07/30/2018
CAD File SP170351S01-QUADRANT

Title
OVERALL SITE PLAN - QUADRANT EXHIBIT

Sheet No.
SP-0.1

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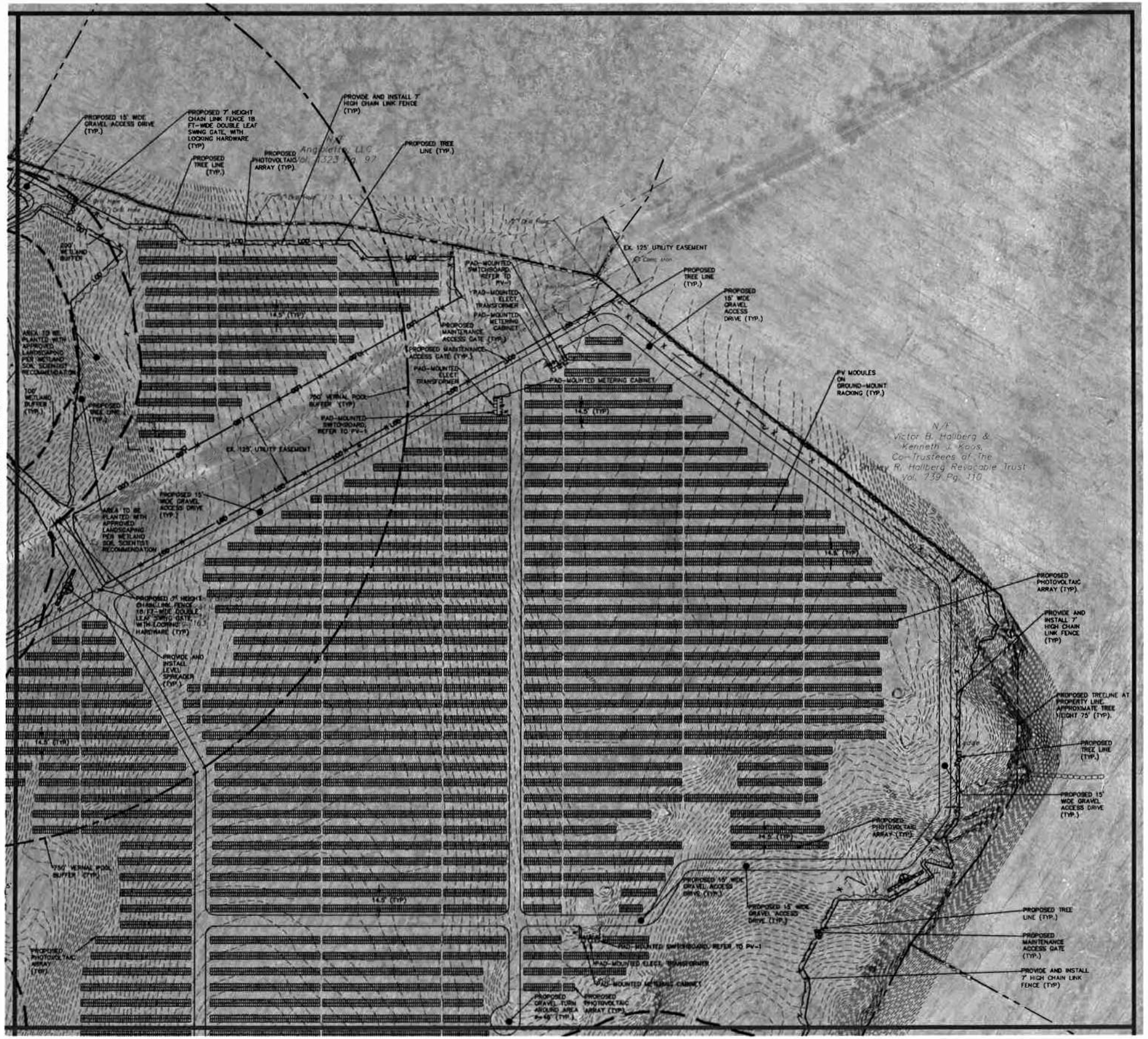
MATCHLINE - SEE SHEET SP-0.1



MATCHLINE - SEE SHEET SP-0.4

LEGEND

PROPERTY LINE	
EXISTING EASEMENT	
LIMITS OF DISTURBANCE/CONTRACT LIMIT LINE	LOD
GROUND MOUNTED PHOTOVOLTAIC (PV) MODULES	
EXISTING WETLANDS	
50'-100' WETLAND BUFFER (UNDISTURBED)	
200' WETLAND BUFFER (REFER TO LANDSCAPING PLANS FOR CLEARING LIMITS AND PROPOSED PLANTINGS WITHIN BUFFER)	
EXISTING VERNAL POOL	
100' VERNAL POOL ENVELOPE (VPE)	
750' CRITICAL TERRESTRIAL HABITAT (CTH)	
EXISTING DIRT ACCESS ROAD	
BOLLARDS	•••
CONCRETE PAD (ELECTRIC UNIT)	•••
PROPOSED GRAVEL ACCESS ROAD	
BITUMINOUS DRIVEWAY APRON	
PROPOSED 7' HIGH CHAIN LINK FENCE	— X — X —
PROPOSED TREE LINE	
FLOW ARROW	

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

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355 Research Parkway
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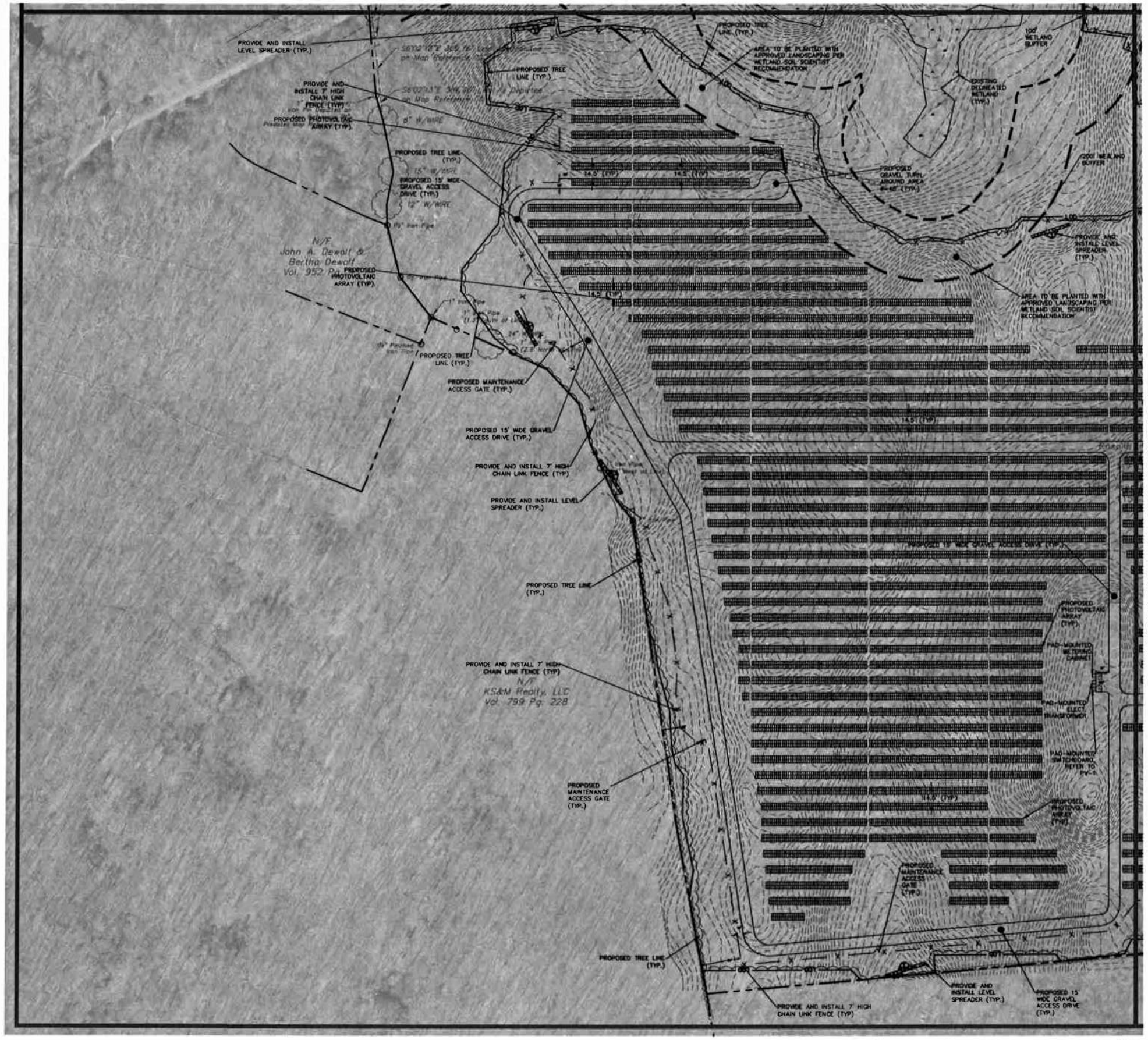
PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=80'
Project No. 17D3515
Date 07/30/2018
CAD File SP170351501-QUADRANT

Title
OVERALL SITE PLAN - QUADRANT EXHIBIT

Sheet No.
SP-0.2

MATCHLINE - SEE SHEET SP-0.1



MATCHLINE - SEE SHEET SP-0.4

LEGEND

- PROPERTY LINE
- EXISTING EASEMENT
- LIMITS OF DISTURBANCE/CONTRACT LIMIT LINE — LOD
- GROUND MOUNTED PHOTOVOLTAIC (PV) MODULES
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- PROPOSED GRAVEL ACCESS ROAD
- BITUMINOUS DRIVEWAY APRON
- PROPOSED 7' HIGH CHAIN LINK FENCE — X — X —
- PROPOSED TREE LINE
- FLOW ARROW

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

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PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

REVISIONS
No. Date Description

Designed	H.J.L.
Drawn	H.J.L.
Reviewed	
Scale	1"=50'
Project No.	17D3515
Date	07/30/2018
CAD File:	SP17D3515(1)-QUADRANT

Title
OVERALL SITE PLAN - QUADRANT EXHIBIT

Sheet No.
SP-0.3

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MATCHLINE - SEE SHEET SP-0.2

MATCHLINE - SEE SHEET SP-0.3

LEGEND

PROPERTY LINE	
EXISTING EASEMENT	
LIMITS OF DISTURBANCE/CONTRACT LIMIT LINE	LOD
GROUND MOUNTED PHOTOVOLTAIC (PV) MODULES	
EXISTING WETLANDS	
50'-100' WETLAND BUFFER (UNDISTURBED)	
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EXISTING VERNAL POOL	
100' VERNAL POOL ENVELOPE (VPE)	
750' CRITICAL TERRESTRIAL HABITAT (CTH)	
EXISTING DIRT ACCESS ROAD	
BOLLARDS	
CONCRETE PAD (ELECTRIC UNIT)	
PROPOSED GRAVEL ACCESS ROAD	
BITUMINOUS DRIVEWAY APRON	
PROPOSED 7' HIGH CHAIN LINK FENCE	X X
PROPOSED TREE LINE	
FLOW ARROW	

GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

REVISIONS
No. Date Desc.

Designed N.J.L.
Drawn N.J.L.
Reviewed
Scale 1"=80'
Project No. 17035915
Date 07/30/2018
CAD File SP170351501-QUADRANT

Title
SITE QUADRANT PLAN

Sheet No.
SP-0.4

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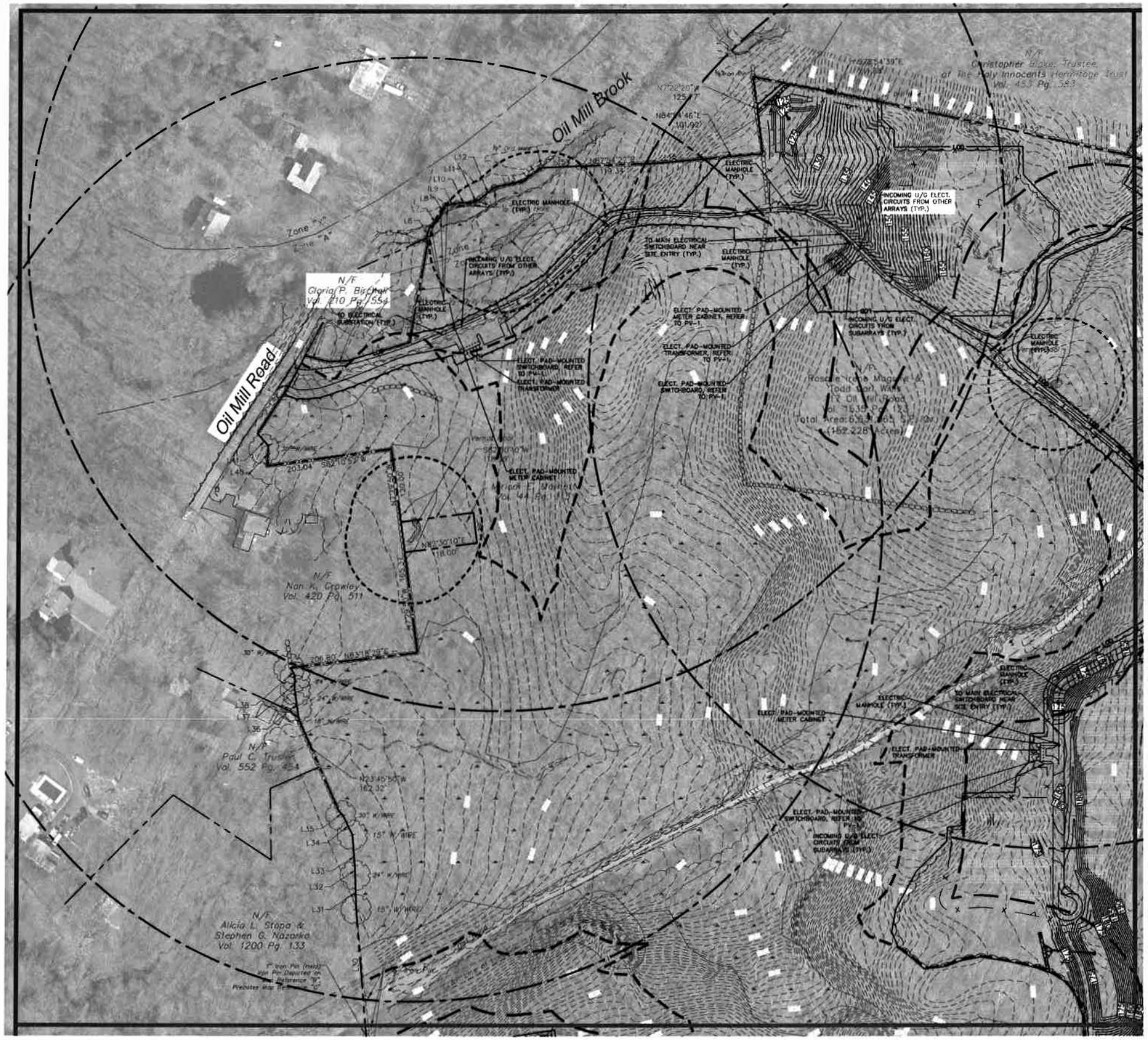

MATCHLINE - SEE SHEET SU-0.2

MATCHLINE - SEE SHEET SU-0.3

LEGEND

PROPERTY LINE	
EXISTING EASEMENT	
LIMITS OF DISTURBANCE/CONTRACT LIMIT LINE	LOD
ELECTRIC LINE	E E
GROUND MOUNTED PHOTOVOLTAIC (PV) MODULES	
EXISTING WETLANDS	
50' WETLAND BUFFER (UNDISTURBED)	
200' WETLAND BUFFER (CLEARED AND PLANTED WITH WETLAND APPROVED LANDSCAPING)	
EXISTING DIRT ACCESS ROAD	
BOLLARDS	
CONCRETE PAD (ELECTRIC UNIT)	
PROPOSED 18' WIDE GRAVEL ACCESS ROAD	
BITUMINOUS DRIVEWAY APRON	
PROPOSED 6' HIGH CHAIN LINK FENCE	
SHADE SETBACK (PROPOSED TREELINE ASSUMED AT PROPERTY LINE, APPROXIMATE TREE HEIGHT = 75')	

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

Architecture
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BL Companies
315 Peoples Park Way
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(203) 635-1406
(203) 635-2315 fax

PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

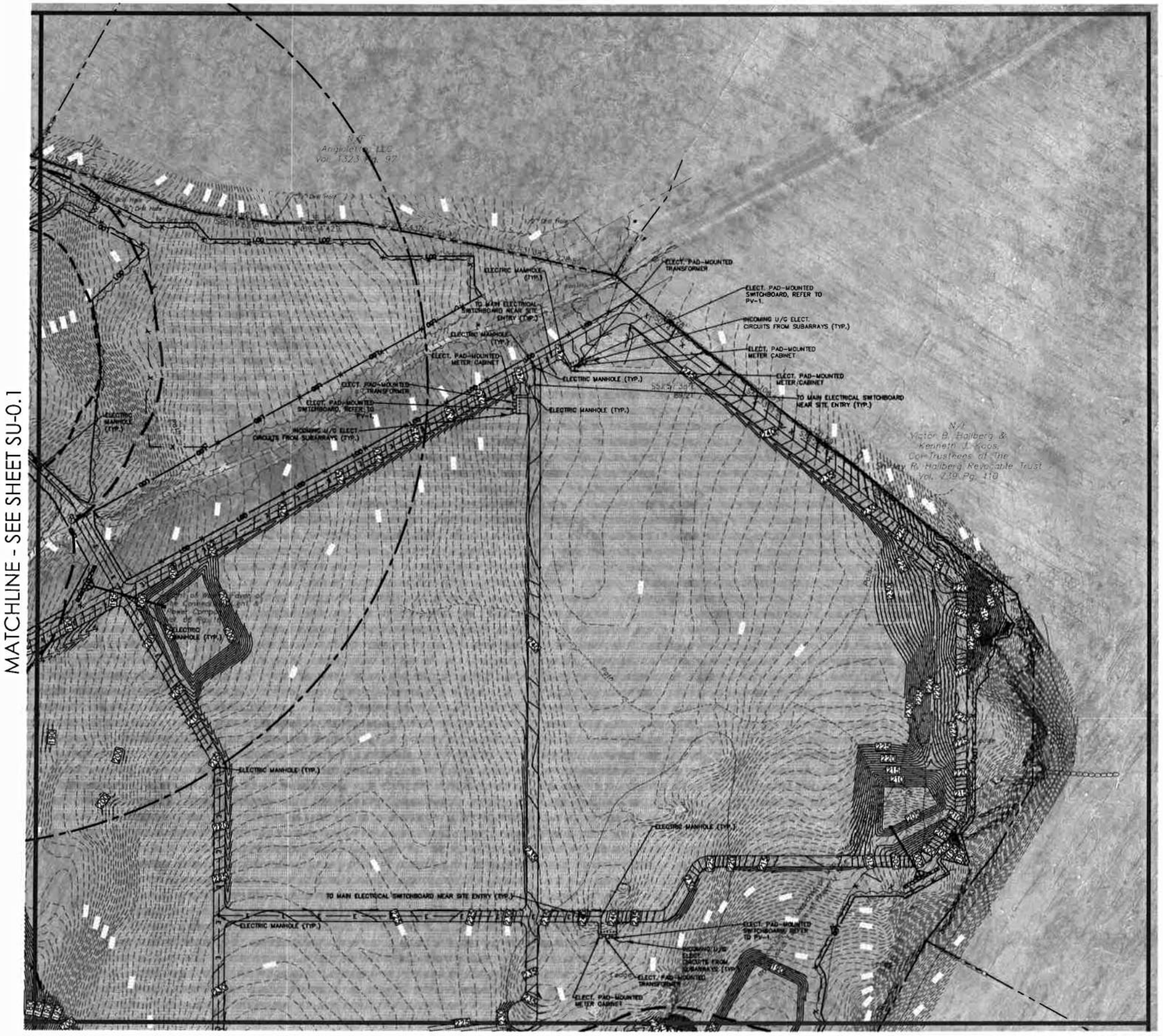
REVISIONS
No. Date Desc.

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=50'
Project No. 1703515
Date 07/30/2018
CAD File SU170351501-QUADRANTS

Title
OVERALL SITE UTILITIES PLAN - QUADRANT EXHIBIT

Sheet No.
SU-0.1

MATCHLINE - SEE SHEET SU-0.1



MATCHLINE - SEE SHEET SU-0.4

LEGEND

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EXISTING EASEMENT	
LIMITS OF DISTURBANCE/CONTRACT LIMIT LINE	LOD
ELECTRIC LINE	E E
GROUND MOUNTED PHOTOVOLTAIC (PV) MODULES	
EXISTING WETLANDS	
50' WETLAND BUFFER (UNDISTURBED)	
200' WETLAND BUFFER (CLEARED AND PLANTED WITH WETLAND APPROVED LANDSCAPING)	
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SHADE SETBACK (PROPOSED TREELINE ASSUMED AT PROPERTY LINE, APPROXIMATE TREE HEIGHT = 75')	

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

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(203) 630-1406
(203) 630-2813 fax

PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

Designed	H.J.L.
Drawn	H.J.L.
Reviewed	
Scale	1"=60'
Project No.	170.3515
Date	07/30/2018
CAD File:	SU170351501-QUADRANTS

Title
OVERALL SITE UTILITIES PLAN - QUADRANT EXHIBIT

Sheet No.
SU-0.2

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MATCHLINE - SEE SHEET SU-0.1

MATCHLINE - SEE SHEET SU-0.4

LEGEND

PROPERTY LINE	
EXISTING EASEMENT	
LIMITS OF DISTURBANCE/CONTRACT LIMIT LINE	LOD
ELECTRIC LINE	E E
GROUND MOUNTED PHOTOVOLTAIC (PV) MODULES	
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REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

FOR PERMITTING PURPOSES ONLY NOT RELEASED FOR CONSTRUCTION

GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

Architecture
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353 Research Parkway
Meriden, CT 06450
(203) 630-1406
(203) 630-0415 Fax

PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

Date:

REVISIONS
No. Date

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=50'
Project No. 1703515
Date 07/30/2018
CAD File SU170351501-QUADRANTS

Title
OVERALL SITE UTILITIES PLAN - QUADRANT EXHIBIT

Sheet No.
SU-0.3

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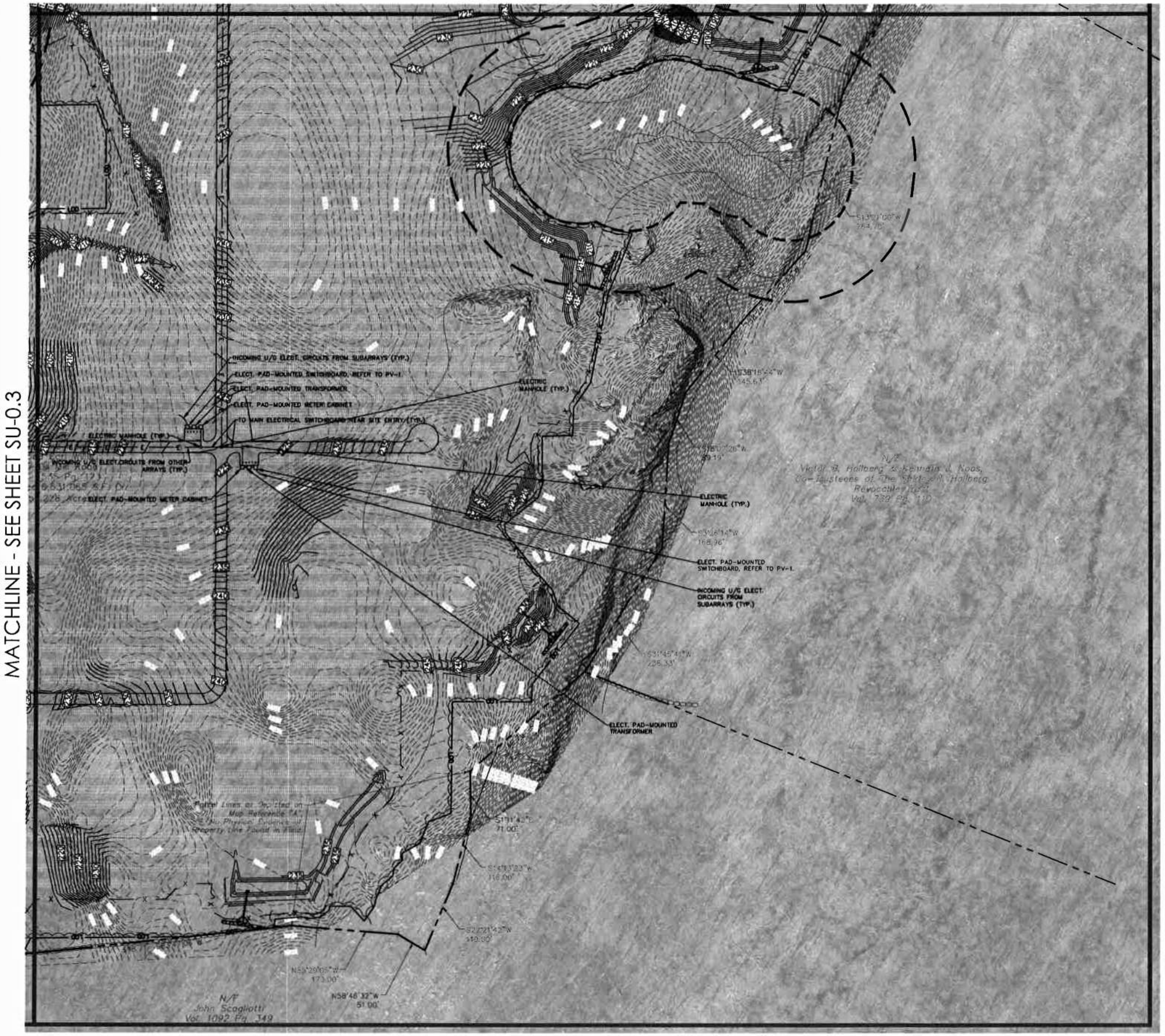
MATCHLINE - SEE SHEET SU-0.2

MATCHLINE - SEE SHEET SU-0.3



LEGEND

PROPERTY LINE	
EXISTING EASEMENT	
LIMITS OF DISTURBANCE/CONTRACT LIMIT LINE	LOD
ELECTRIC LINE	E E
GROUND MOUNTED PHOTOVOLTAIC (PV) MODULES	
EXISTING WETLANDS	
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BOLLARDS	
CONCRETE PAD (ELECTRIC UNIT)	
PROPOSED 18' WIDE GRAVEL ACCESS ROAD	
BITUMINOUS DRIVEWAY APRON	
PROPOSED 6' HIGH CHAIN LINK FENCE	x x x x
SHADE SETBACK (PROPOSED TREELINE ASSUMED AT PROPERTY LINE. APPROXIMATE TREE HEIGHT = 75')	

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

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(203) 630-2615 Fax

PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=80'
Project No. 1703515
Date 07/30/2018
CAD File SU170351501-QUADRANTS

Title
OVERALL SITE UTILITIES PLAN - QUADRANT EXHIBIT

Sheet No.
SU-0.4

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EXHIBIT C

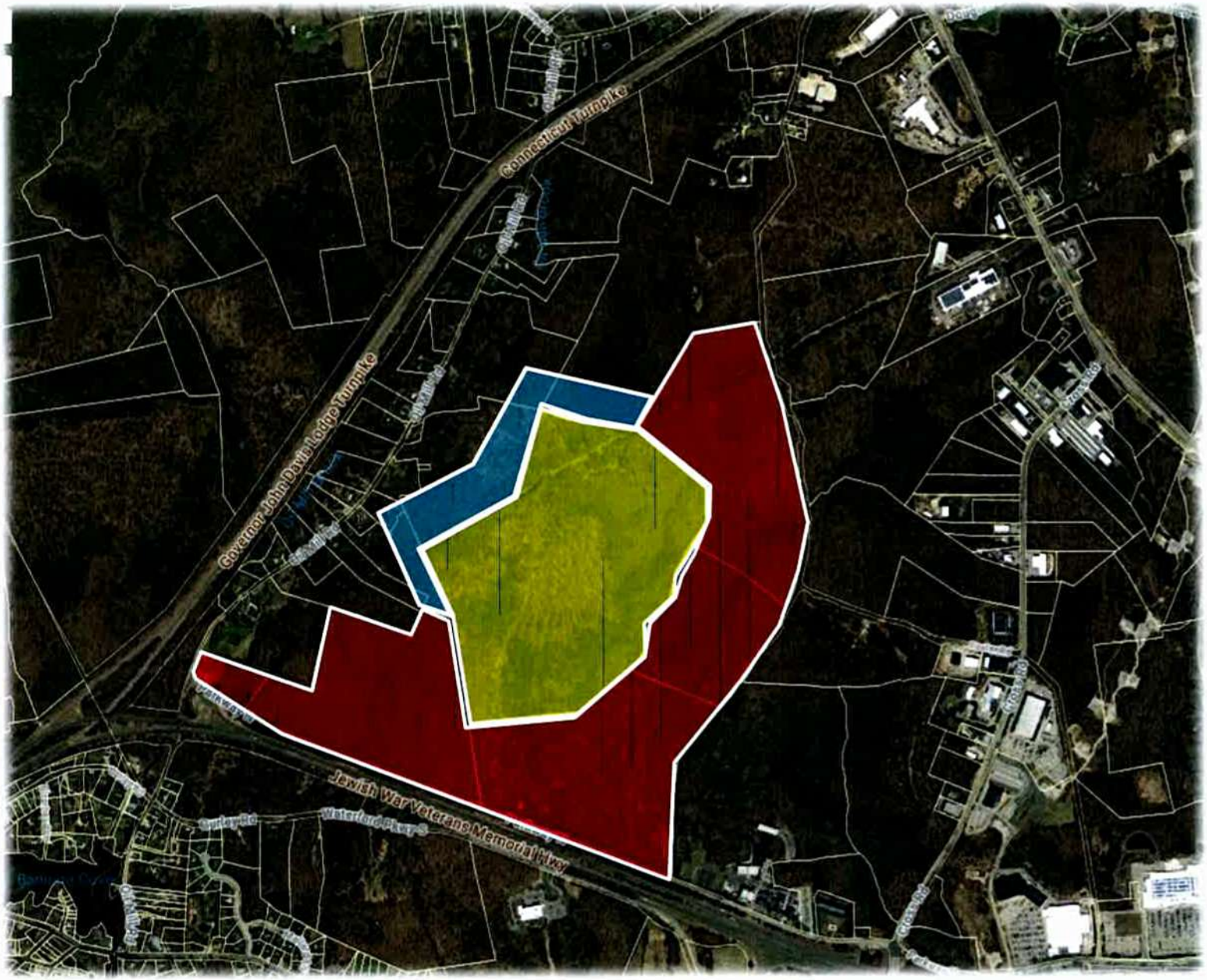
Greenskies
a Clean Focus company

Waterford Zoning Map

Yellow: Proposed Solar Farm

Red: General Industrial Zone

Blue: Residential Zone



180 Johnson St
Middletown, CT 06457

EXHIBIT D

GROUND LEASE

BY AND BETWEEN

Carl Willis Jr. and Rosalie Watson f/k/a Rosalie Irene McGuire and Thomas J. Londregan, Co-Trustees

(LANDLORD)

AND

GRE GACRUX LLC
(TENANT)

GROUND LEASE

THIS AGREEMENT is dated as of the 30th day of April, 2016 (the "Effective Date") by and between **CARL WILLIS JR.** with an address of 866 Noank Ledyard Road, Mystic, Connecticut and **ROSALIE I. WATSON F/K/A ROSALIE IRENE MCGUIRE AND THOMAS J. LONDREGAN, CO-TRUSTEES OF THE TESTAMENTARY TRUST ESTABLISHED UNDER THE LAST WILL AND TESTAMENT OF VIVIAN M. WILLIS** ("Landlord") and **GRE GACRUX LLC**, a Connecticut limited liability company with an address c/o Greenskies Renewable Energy LLC, 10 Main Street, Suite E, Middletown, Connecticut 06457 ("Tenant").

IT IS AGREED:

ARTICLE I.

Description of Leased Premises

Section 1.1 - Leased Premises. The Landlord hereby leases to the Tenant that certain piece of land known as 117 Oil Mill Road, Waterford, Connecticut containing approximately 88 acres of land, together with any and all improvements, appurtenances, rights, privileges and easements benefiting, belonging or pertaining thereto and any right, title and interest of the Landlord in and to any land lying in the bed of any street, road or highway to the center line thereof in front of or adjoining said parcel of land, which is more particularly described in **Exhibit A**, attached hereto and made a part hereof (collectively the "Leased Premises" or "Premises").

Section 1.2 - Initial Term. The initial term of this Lease shall commence on the Commencement Date, as hereinafter defined, and shall end on the date which is twenty (20) years from the end of the calendar month in which the Commencement Date occurs, which time period is referred to herein as the "Initial Term".

When such dates have been determined, Landlord and Tenant agree to execute a memorandum in recordable form setting forth the Commencement Date, and Lease Term in the form attached hereto as **Exhibit B**.

Section 1.3 - Options to Extend. In addition, provided that Tenant is not in default in the performance of any of its obligations under this Lease beyond applicable notice and cure periods, Tenant shall have the option to extend the term of this Lease for four (4) extension periods of five (5) years each (each an "Extension Period"). If Tenant elects to exercise any such Extension Period, it shall do so by giving notice of such election to Landlord at any time during the term of this Lease on or before the date which is ninety (90) days prior to the commencement of the Extension Period for which such election is exercised. Such Extension Periods shall be upon the same terms and conditions of this Lease, except as otherwise provided herein. If Tenant fails to send notice of its exercise of any Extension Period in a timely manner, Landlord shall send Tenant a reminder notice and Tenant shall have an additional thirty (30) day period after receipt of Landlord's notice in order to exercise any such Extension Period. The Initial Term and all

Extension Periods, as exercised, are referred to hereafter as the "Lease Term." In the event that Tenant does not respond in writing within thirty (30) days after the receipt of Landlord's reminder notice, then Tenant shall be deemed not to have exercised the applicable Extension Period and the Tenant agrees that any right to exercise any future Extension Period has lapsed.

ARTICLE II.

Development of Project

Section 2.1 - Development Period. Prior to the Initial Term, and for a period of time described in this Section 2.1, Tenant shall be permitted to perform all investigations deemed by the Tenant to be necessary or appropriate to determine, in the Tenant's sole discretion, whether the operation of the Leased Premises for Tenant's intended purposes is economically and operationally feasible, including without limitation, review of the status of title and survey matters, the environmental and physical condition of the Leased Premises, and its suitability for development for Tenant's intended use. Tenant shall have a period commencing on the Effective Date and ending at 12:00 midnight on the date which is four (4) months after the Effective Date (the "Due Diligence Period") within which to inspect, examine, and/or investigate the Leased Premises, and all physical, environmental, geotechnical, financial, title and legal aspects thereof, and the obligations of Landlord hereunder shall be conditioned upon Tenant being fully satisfied, in its sole discretion, as to all such inspections, investigations, and/or examinations.

Landlord shall fully cooperate with Tenant in its inspections, examinations, and investigations and shall use its best efforts to deliver or make available to Tenant no later than thirty (30) days from the Effective Date those documents set forth on **Exhibit C**, attached hereto and incorporated herein, if applicable, which are in the control or possession of Landlord, its agents or representatives. Throughout the Due Diligence Period, Tenant shall have access to the Leased Premises to accomplish the foregoing, including, without limitation, the conduct of surface and subsurface tests and physical and environmental appraisals and studies and as provided in Section 2.2 of this Agreement. In the event that the Tenant terminates this Lease during the Due Diligence Period or the Contingency Period(s), Tenant shall provide to Landlord, at no cost to Landlord, copies of all due diligence reports, studies, investigations and surveys of the Property.

In the event that Tenant is not satisfied, in its sole discretion, for any reason or for no reason whatsoever, Tenant shall have the right, by Tenant or Tenant's attorney giving Landlord or Landlord's attorney a written termination notice (the "Termination Notice") to terminate this Agreement. If the Termination Notice is given, this Lease shall terminate and shall be null and void, and Landlord and Tenant shall have no further obligations to one another hereunder, except for obligations which specifically survive the termination of this Lease. Tenant may terminate this Lease upon notice to Landlord at any time prior to the Commencement Date if Tenant, in its sole discretion, determines that the Leased Premises is unsuitable for its intended use. Upon any such termination, Tenant shall deliver to Landlord a written notice executed by a duly authorized representative of Tenant unequivocally terminating this Lease.

Tenant's obligations under this Agreement shall be subject to Tenant's receipt of all final, non-appealable, local, state and federal permits and approvals necessary or appropriate for Tenant's proposed development of the Leased Premises for the installation of solar panels and appurtenant facilities utilized for the generation of electricity (the "Project") and the construction of the Project on terms and conditions acceptable to Tenant in its sole discretion (individually, each an "Approval" and collectively, the "Approvals") prior to the date which is six (6) months following the first day of the month after the expiration of the Due Diligence Period (the "Initial Contingency Period"). Tenant shall pay to Landlord in consideration of Landlord's agreement to enter into the Lease, the sum of Dollars for each month during the Initial Contingency Period, which consideration shall be due and payable on the first (1st) day of the first (1st) month of the Initial Contingency Period and on the first (1st) day of each month thereafter during the Initial Contingency Period (each, a "Contingency Payment"). Tenant shall be permitted to extend the Initial Contingency Period by written notice to Landlord at any time prior to the expiration of the Initial Contingency Period for an additional period of six (6) months provided that Tenant is pursuing its Approvals (the "First Extended Contingency Period"). If Tenant extends the Initial Contingency Period by the First Extended Contingency Period, Tenant shall pay Landlord on or before the first (1st) day of the first (1st) month of the First Extended Contingency Period and on or before the same day of each month thereafter during the First Extended Contingency Period. Tenant shall further be permitted to extend the First Extended Contingency Period by written notice to Landlord at any time prior to the expiration of the First Extended Contingency Period for an additional period of six (6) months provided that Tenant is pursuing its Approvals (the "Second Extended Contingency Period"). If Tenant extends the First Extended Contingency Period by the Second Extended Contingency Period, Tenant shall pay Landlord on or before the first (1st) day of the first (1st) month of the Second Extended Contingency Period and on or before the first (1st) day of each subsequent month during the Second Extended Contingency Period.

In addition to the foregoing extensions of the Initial Contingency Period, if (i) Tenant is pursuing its Approvals at the expiration of the Second Extended Contingency Period or (ii) Tenant has received its Approvals but one or more judicial appeals are then pending with respect to the Approvals at the expiration of any of the foregoing Contingency Periods, Tenant shall also be permitted to extend such Contingency Periods by written notice to Landlord at any time prior to the expiration of the then current Contingency Period for additional periods of one (1) month each provided that Tenant is either pursuing its Approvals or such judicial appeals are then pending (the "Additional Extended Contingency Periods"). If Tenant exercises its right to any Additional Extended Contingency Periods, Tenant shall pay Landlord for each such Additional Extended Contingency Period on or before the first (1st) day of the first (1st) month of each successive Additional Extended Contingency Period. The Initial Contingency Period, as same may be extended by the First Extended Contingency Period, the Second Extended Contingency Period and the Additional Extended Contingency Periods, are collectively and each, individually, is the "Contingency Period", and the Contingency Period together with the Due Diligence Period, collectively, is the "Development Period".

The Contingency Payments shall be non-refundable and shall not be applied to the payment of rent otherwise due under the terms and provisions of this Lease, it being recognized by the Landlord and Tenant that the Contingency Payments are solely in consideration of Landlord's agreement to remove the Leased Premises from the market during the Development Period. Notwithstanding anything herein contained to the contrary, the Contingency Period shall commence on the first (1st) day of the first (1st) month subsequent to the expiration of the Due Diligence Period. If Tenant has received all of its Approvals to its satisfaction, Tenant may elect to waive the balance of the Contingency Period and no further Contingency Payments shall be due or payable.

Landlord agrees to fully cooperate with Tenant in Tenant's efforts to obtain all Approvals, including, without limitation, executing and delivery of any applications or consents which require the signature of the Landlord and publicly supporting such Approvals by attending any hearings or meetings, as and when reasonably requested by Tenant. Landlord appoints Tenant as its lawful attorney-in-fact coupled with an interest to execute any such requested application in the name of and on behalf of Landlord if Landlord fails to do so within fifteen (15) days following receipt of Tenant's written notice requesting Landlord's execution of the subject application.

If Tenant determines, in its sole discretion, that it has not or is unlikely to obtain all necessary or appropriate Approvals before the end of the Contingency Period, or that any such Approvals contain, or are likely to contain, unsatisfactory terms or conditions, then Tenant shall have the right, by Tenant or Tenant's attorney giving Landlord or Landlord's attorney a written termination notice executed by a duly authorized representative of the Tenant (the "Termination Notice"), to terminate this Agreement. If the Termination Notice is given, this Lease shall terminate and shall be null and void, and Landlord and Tenant shall have no further obligations to one another hereunder, except for obligations which specifically survive the termination of this Lease.

Section 2.2 - Access to Leased Premises. During the Development Period Landlord may retain possession and use of the Leased Premises. Tenant, its counsel, surveyors, engineers, lenders, development partners, agents and other representatives shall have access to the Premises and all parts thereof for the purposes of conducting its due diligence inspections and investigations, at reasonable times and upon reasonable notice to the Landlord (which notice may be given by telephone) as well as to all relevant documents and records of the Landlord as they relate to the title, physical condition, and development of the Premises. Tenant shall use commercially reasonable efforts not to unduly interfere with any business operations of Landlord. Said right of access shall be for the purpose of performing surveying, engineering, and environmental tests and studies, test borings, hazardous waste testing, wetland impacts and such other similar investigatory work as the Tenant shall consider appropriate. Tenant shall make no permanent alterations to the Leased Premises as part of its investigations and shall repair or restore any disturbed areas to substantially the same condition as existing prior to the testing. Prior to accessing the Premises, Tenant shall provide Landlord with a Certificate of Liability Insurance in the amount of at least $1,000,000 naming Landlord as an additional insured. Tenant further agrees to hold the Landlord harmless from and indemnify the Landlord for any and all loss, damage, claim or expense suffered or incurred by Landlord as a result of the

activities of the Tenant on the Leased Premises including the activities of Tenant's environmental consultants, engineers, surveyors, contractors and other consultants. This hold harmless and indemnification provision shall extend to reasonable attorney's fees and costs incurred by the Landlord in the defense of any claim against the Landlord arising out of the activities of the Tenant on the Leased Premises while conducting its due diligence inspections, including, but not limited to, claims arising out of the non-payment of any such environmental consultant, engineer, surveyor, contractor or other consultant retained by the Tenant.

Section 2.3 - Lease Commencement. At any time during the Development Period, Tenant may give notice to Landlord calling for the delivery of the Leased Premises to Tenant and the commencement of this Lease. Upon receipt of such notice, Landlord shall select a delivery date that is within forty-five (45) days of the date Landlord received Tenant's notice ("Commencement Date") and so notify Tenant.

On the Commencement Date, Landlord shall deliver possession of the Leased Premises to Tenant in substantially the same condition as existing as of the date of this Lease, free and clear of all rights of any tenants or parties in possession and subject to only those encumbrances affecting title to the Leased Premises as set forth on **Exhibit D** attached hereto and made a part hereof. Notwithstanding anything herein contained to the contrary, Landlord shall have the right, at any time prior to, and for a period of ninety (90) days subsequent to the Commencement Date, to conduct a timber harvest of all timber on the Leased Premises and to retain the proceeds obtained from such timber harvest. In conjunction therewith, Landlord shall have no obligation to stump the Leased Premises nor to remove slash from the Leased Premises; provided, however, that if Landlord does proceed to conduct a timber harvest, Landlord shall leave three (3) to four (4) feet of stump in each instance in order to allow for the ease of removal of the stumps by the Tenant. Landlord agrees that Landlord shall, prior to conducting such timber harvest, obtain any and all permits and authorizations to conduct such timber harvest, and that Landlord shall complete such timber harvest within ninety (90) days subsequent to the Commencement Date.

ARTICLE III.

Rent

Section 3.1 - Definition of Lease Year. "Lease Year" shall mean, in the case of the first Lease Year, the number of full and partial calendar months following the Commencement Date of this Lease through the end of the twelve calendar months following the Rent Commencement Date. Thereafter, "Lease Year" shall mean each successive twelve calendar month period following the expiration of the first Lease Year, except that in the event of the termination of this Lease on any day other than the last day of a Lease Year, then the last Lease Year shall be the period from the end of the preceding Lease Year to such date of termination.

Section 3.2 - Basic Rent. Commencing on the Rent Commencement Date, as defined hereafter, and continuing for the remainder of the Lease Term, Tenant shall pay Landlord monthly Basic Rent on the first day of each month, in advance, in accordance with the following schedule:

Lease Years	Annual Basic Rent	Monthly Installment
1-20		
21-25		
26-30		
31-35		
36-40		

The Rent Commencement Date shall be the date that is the first (1st) day of the third (3rd) month following the Commencement Date. Payments for any partial month shall be prorated.

Section 3.3- Place of Payment. Payment of Basic Rent shall be made to the Landlord at the address appearing at the end of this Lease, or to such other person, legal entity or address as the Landlord shall designate by written notice to the Tenant.

ARTICLE IV.

Use

Section 4.1 - Use of Premises. The Leased Premises may be used for placement of a Solar Array and appurtenant facilities during the Lease Term, subject to applicable zoning and other applicable land use regulations.

Tenant shall have the unrestricted right throughout the Lease Term to construct one or more Solar Arrays and other related improvements on the Leased Premises and to modify or demolish such Solar Arrays and related improvements from time to time, with or without constructing replacement improvements thereon, all subject to all applicable laws and regulations, but without prior notice or consent by Landlord. Title to all Solar Arrays and other related improvements constructed on the Leased Premises by Tenant shall remain in Tenant's name throughout the Lease Term.

Section 4.2 - Compliance With Laws and Regulations. Throughout the Lease Term, the Tenant, at its sole cost and expense, will promptly comply in all material respects with all present and future laws, ordinances, orders, rules, regulations and requirements of all Federal, State and municipal governments, departments, commissions, boards and officers with respect to its use of the Leased Premises.

Section 4.3 - Liens. The Tenant shall indemnify and save the Landlord harmless from any claims for material or labor, or worker's compensation claims in connection with any repairs or improvements made by the Tenant, and should any such lien be placed, the Tenant shall have the same removed within sixty (60) days by bonding or otherwise; and upon failure to do so, Landlord shall have the right to pursue remedies available pursuant to Article XI of this Lease, or the Landlord shall have the right (but not the obligation) to take whatever steps are reasonably necessary to have the same removed and the cost thereof, plus any court costs and reasonable attorney's fees, shall be paid by the Tenant to the Landlord.

Section 4.4 – Real Property and Personal Property Taxes. During the term of this Lease, Tenant shall pay all real property taxes due the Town of Waterford, Connecticut for the Leased Premises on or before the due date on which the payment of such real property taxes is due. In addition, Tenant shall pay any and all personal property taxes assessed against the Tenant for the personal property installed by the Tenant on the Leased Premises in accordance with the terms and provisions of this Lease on or before the due date for the payment of such personal property taxes. As of the Rent Commencement Date, taxes on the real property which is the subject of this Lease shall be apportioned between the Landlord and the Tenant on a uniform fiscal year basis.

ARTICLE V.

Quiet Enjoyment

Landlord represents and warrants that it is the owner of the Leased Premises in fee simple, free and clear of all liens and encumbrances, except as shown on **Exhibit D**, and has the right and lawful authority to enter into this Lease, without approval of any other party. The Tenant shall, upon paying the rent reserved hereunder and observing and performing all of the terms, covenants and conditions on the Tenant's part to be observed and performed, peaceably and quietly, have and hold the Leased Premises, without hindrance or molestation by any person or persons claiming by, through or under the Landlord, subject, however, to the terms of this Lease.

ARTICLE VI.

Utilities

Intentionally omitted.

ARTICLE VII.

Insurance

Section 7.1 - Coverage. Tenant shall keep the Leased Premises insured against damage or destruction by fire, and such other perils as are, from time to time, included in standard fire insurance policy, for the full insurable value thereof, which for the purposes hereof shall mean the actual replacement cost without deduction for depreciation, but shall not include "uninsurables" (i.e., footings, underground piping, etc.). All of said insurance shall be maintained for the protection of Landlord, Landlord's lender, Tenant and Tenant's lender, and each shall be listed as an additional insured as their interest may appear in all policies of insurance. The proceeds of such insurance in case of loss or damage shall be applied on account of the obligation of Tenant to repair and/or rebuild the Leased Premises pursuant to Article VIII to the extent that such proceeds are required for such purpose.

Section 7.2 - General Liability Insurance. During the Lease Term, the Tenant agrees to maintain in force and effect a commercial general liability insurance policy, with limits of at least Two Million Dollars ($2,000,000.00) per occurrence, in a financially responsible insurance

company or companies qualified to do business in the state in which the Leased Premises are located. Said insurance shall be maintained for the protection of both Landlord, Landlord's lender, Tenant, and Tenant's lender and each shall be named insured as their interest may appear in all policies of insurance. Said insurance shall be primary and noncontributory; provide for severability of interest; provide that an act or omission of one of the insureds that would void or otherwise reduce coverage will not reduce or avoid the coverage as to other insureds. Such policy shall contain a provision that it cannot be canceled without thirty (30) days prior written notice to Landlord and Tenant.

Section 7.3 - Release of Subrogation.

(a) Each party covenants and agrees to obtain from its insurance carrier a waiver of subrogation rights against the other, if the same is available, with the provision that if there is any extra cost for the same, the party benefited by such waiver shall be afforded an opportunity to pay the extra cost and receive the benefit of the waiver; and

(b) In case of damage to the Leased Premises or to any other property of the Landlord or the Tenant by any cause within the scope of such insurance, whether such damage be caused by the negligence of either party to this Lease or by any party for whom either party to this Lease may be responsible, neither party to this Lease will look to the other, its agents, employees, invitees, assignees or subtenants for reimbursement to its insurer or to any third party against whom it may have a claim therefor. This subsection shall be effective as to the risks insured against under any particular insurance policy only during such time as such policy shall permit an executory waiver of subrogation without additional premium therefor or if the party benefited by such waiver pays any additional premium.

Section 7.4 - Certificates of Insurance. On or before the date upon which possession of the Leased Premises is delivered to Tenant, Tenant shall provide Landlord with certificates of insurance certifying that all insurance required to be carried by Tenant under the terms of this Lease is in full force and effect. Prior to the expiration of any such insurance policy, Tenant shall furnish Landlord with a new certificate of insurance certifying that such policy has been renewed or replaced. All insurance policies carried under this Article, and the certificates for such policies, shall provide for ten (10) days written notice to Landlord of any cancellation for non-payment and (30) days written notice to Landlord of any cancellation or non-renewal of such policy.

Section 7.5 - Qualification of Insurers. All insurance provided for in this Lease shall be effected under enforceable policies issued by insurers of recognized responsibility, licensed to do business in the State of Connecticut.

Section 7.6 - Indemnification. The Tenant shall defend, indemnify and save harmless the Landlord and its agents and employees against and from all liabilities, suits, actions, damages, liability and expense, penalties, claims and costs which may be imposed upon or incurred by or asserted against the Landlord or its agents or employees by reason of, or in any way arising out of, the Tenant's use or occupancy of the Leased Premises in accordance with the terms of this Lease after the execution of this Lease to the extent occasioned wholly or in part by any act or omission of the Tenant, its agents, employees, contractors or invitees; excluding however, any

matters arising out of the negligence or willful conduct of Landlord, its agents, employees, contractors or invitees.

The Landlord shall defend, indemnify and save harmless the Tenant and its agents and employees against and from all liabilities, suits, actions, damages, liability and expense, penalties, claims and costs which may be imposed upon or incurred by or asserted against the Tenant or its agents or employees by reason of, or in any way arising out of, the Landlord's use or occupancy of the Leased Premises to the extent occasioned wholly or in part by any act or omission of the Landlord, its agents, employees, contractors or invitees, excluding however, any matters arising out of the negligence or willful conduct of Tenant, its agents, employees, contractors or invitees.

ARTICLE VIII.

Condemnation

Section 8.1 - Condemnation - Taking of All. If title to the whole of the Leased Premises shall be taken or condemned by any competent authority or conveyed in lieu of condemnation for any public or quasi-public use, all rental and other charges paid or payable by Tenant hereunder shall be prorated, as of the date of vesting of title in such condemning authority, and the total award made with respect to the Leased Premises, less all expenses incurred in connection with the condemnation proceedings, shall be apportioned between Landlord and Tenant on a commercially reasonable basis.

Section 8.2 - Condemnation - Taking of Substantially All. If title to any substantial part of the Leased Premises is taken or condemned by any competent authority or conveyed in lieu of condemnation for any public or quasi-public use, Tenant shall have the option to surrender and terminate this Lease by giving written notice of such election to Landlord at any time after Tenant has been notified of any pending condemnation action. In the event that Tenant exercises its option to surrender and terminate this Lease, all of the rental and other charges paid or payable by Tenant hereunder shall be prorated as of the date the Tenant vacates the Leased Premises, and the total award made with respect to the Leased Premises, less all expenses incurred in connection with the condemnation proceedings, shall be apportioned between Landlord and Tenant on a commercially reasonable basis.

Section 8.3 - Condemnation - Taking of Less Than All. If title to part of the Leased Premises shall be taken or condemned by any competent authority or conveyed in lieu of condemnation for any public or quasi-public use, and this Lease is not or cannot be terminated by Tenant, then this Lease shall continue in force and effect, and Tenant shall, at its expense, repair any damage to the Solar Array and appurtenant improvements on the Leased Premises and the Basic Rent thereafter payable for the remainder of the Lease Term shall be reduced in the proportion that the area of the Leased Premises taken or conveyed to the condemning authority bears to the area of the entire Leased Premises prior to the taking or conveyance and the total award made with respect to the Leased Premises, less all expenses incurred in connection with the condemnation proceedings, shall be apportioned between Landlord and Tenant, in accordance with the following provisions.

Whether such condemnation or sale in lieu thereof shall be for all or part of the Leased Premises and the Solar Arrays and related improvements thereon, subject to the immediately succeeding paragraph, Landlord and Tenant shall each have the right to prosecute for and to receive such separate awards and portions of lump sum awards as may be allocated to their respective interests in the Leased Premises, it being the intent of the parties that Landlord shall be entitled to that portion of the award applicable to the land as unimproved exclusive of the Solar Arrays and improvements thereon, but benefiting from the value of this Lease, and Tenant shall be entitled to the balance of the award which shall include the value of Tenant's leasehold estate and the Solar Arrays and related improvements on the Leased Premises. If the condemning authority does not make separate awards and allocations as above provided, then the allocations based on the principles set forth in this Section shall be determined by arbitration.

ARTICLE IX.

Mortgages

Section 9.1 - Landlord's Right to Mortgage. Landlord reserves the right to mortgage its fee interest in the Leased Premises from time to time throughout the Lease Term (as applicable "Fee Mortgage"). All Fee Mortgages shall be subject to this Lease and the Tenant's rights hereunder. Landlord agrees to cause all Fee Mortgage mortgagees to execute agreements in favor of Tenant and any leasehold mortgagees in form and substance reasonably acceptable by Tenant or any leasehold mortgagee, as the case may be, confirming that in the event of a foreclosure of the Fee Mortgage such fee mortgagee shall recognize the rights of Tenant and any leasehold mortgagees under this Lease and not disturb Tenant's tenancy hereunder except in accordance with the terms hereof. Landlord agrees to deliver an agreement in the form attached hereto as **Exhibit D** or otherwise in form and substance reasonably acceptable to Tenant or any leasehold mortgagee, as the case may be, from the holder of any Fee Mortgage currently encumbering the Leased Premises consenting to this Lease and any amendments thereto, providing the non-disturbance protection required hereunder and agreeing that any casualty and condemnation proceeds shall be applied in accordance with the provisions of this Lease within thirty (30) days after the date of execution of this Lease.

Section 9.2 - Tenant's Right to Mortgage. Tenant shall have the right to mortgage its leasehold interest in the Leased Premises pursuant to this Lease from time to time throughout the Lease Term (as applicable, "Leasehold Mortgage").

Section 9.3- Assignment by Mortgagee as Successor to Tenant. If any leasehold mortgagee shall acquire title to Tenant's interest in this Lease, by foreclosure of a mortgage thereon or by assignment in lieu of foreclosure or by an assignment from a nominee or wholly owned subsidiary corporation of such mortgagee, or under a new lease pursuant to this Article IX, such mortgagee may assign such Lease, and notwithstanding anything contained in Article X hereof shall thereupon be released from all liability for the performance or observance of the covenants and conditions in such Lease contained on Tenant's part to be performed and observed from and after the date of such assignment, provided that the assignee from such mortgagee shall have assumed such lease in accordance with Article X hereof.

Section 9.4 - Estoppel Certificate. Landlord and Tenant shall, from time to time upon written request by the other, execute and deliver to the other party and their mortgage lenders or potential lenders, if requested, within ten (10) days of such written request, a written declaration in recordable form: (1) ratifying this Lease; (2) expressing the commencement and termination dates thereof and any renewal terms; (3) certifying that this Lease is in full force and effect and has not been assigned, modified, supplemented or amended (except by such writings as shall be stated); (4) stating that all conditions under this Lease to be performed by the other party have been satisfied, or stating those alleged to remain unsatisfied; (5) stating that there are no defenses or offsets against the enforcement of this Lease by such party, or stating those claimed by such party; (6) stating the amount of advance rent, if any, paid by Tenant; (7) stating the date to which rent has been paid; and (8) stating such other matters as are reasonably requested by any permitted leasehold mortgagee.

Section 9.5 - No Joint Venture. Notwithstanding any obligation from one party to the other herein, the parties hereto state that they have not created and do not intend to create by this Lease a joint venture or partnership relation between them; it being their sole purpose and intent to create only a landlord-tenant relationship.

ARTICLE X.

Assignment

Tenant shall have the right to assign Tenant's interest in this Lease from time to time throughout the Lease Term provided each such assignee assumes all of Tenant's obligations under the Lease. After the completion of the Project on the Leased Premises, Landlord agrees that Tenant shall be released from any further obligations under this Lease if Landlord is provided with a fully executed original assignment. If Landlord fails to respond to any request for consent to an assignment within twenty (20) business days, such request for consent shall be deemed approved.

ARTICLE XI.

Default

Section 11.1 - Default by Tenant. Each of the following shall be an Event of Default by Tenant:

(a) if default shall be made in the due and punctual payment of any Basic Rent or real or personal property taxes payable under this Lease or any part thereof, when and as the same shall become due and payable, and such default shall continue for a period of fifteen (15) days after notice from Landlord to Tenant specifying the items in default; provided that before any termination of this Lease, Tenant shall be afforded an additional fifteen (15) day written notice and opportunity to cure; or

(b) the failure of Tenant to continually maintain general liability insurance as required herein on the Leased Premises and to name Landlord and any fee mortgagee as an additional insured thereunder; or

(c) Neglect or failure by the Tenant to perform or comply with any of the agreements, terms, covenants or conditions of this Lease, other than those referred to in subsection (a) or subsection (b) above, for a period of sixty (60) days after written notice from the Landlord to the Tenant specifying the items in default, or in the case of a default which cannot with due diligence be cured within such sixty (60) day period, failure of the Tenant within such sixty (60) day period to commence to cure the same and thereafter to prosecute the curing of such default with due diligence and to completion; or

(d) The commencement of any bankruptcy proceedings by or against the Tenant, provided, however, the commencement of an involuntary proceeding against Tenant shall not be an Event of Default if Tenant is diligently pursuing the dismissal of any such involuntary proceeding and accomplishes such cure within one hundred twenty (120) days.

Section 11.2 - Landlord's Remedies. Subject to the provisions of Article IX, upon the occurrence of an Event of Default by Tenant, this Lease shall, at the option of Landlord, terminate and come to an end on the date specified in a notice of cancellation from Landlord to Tenant, and Tenant shall quit and surrender the Leased Premises to the Landlord as if the term hereunder ended by the expiration of the time fixed herein, but Tenant shall remain liable for all sums accruing prior to the termination of this Lease, plus any other sums due and payable pursuant to this Section 11.2. Upon such termination, Tenant shall be afforded one hundred twenty (120) days to remove the Solar Arrays from the Leased Premises, as such time may be extended if Tenant is diligently pursing the removal of the Solar Arrays, which removal shall constitute an affirmative obligation of the Tenant hereunder. During the period of time that Tenant is pursuing the removal of the Solar Arrays, Tenant shall continue to pay the monthly Basic Rent until such time as the Solar Arrays are removed from the Lease Premises.

If an Event of Default occurs and Landlord elects not to terminate this Lease, then Landlord shall have the immediate right, pursuant to legal process, if any be applicable, to pay any sums or do any act on behalf of Tenant, in order to cure a default by Tenant, and any sums expended by Landlord, together with interest thereon at a rate of 12% per annum, shall be immediately due and payable by Tenant to Landlord.

In addition to the foregoing, if Tenant shall fails to promptly cure any non-monetary default and such default has created an emergency situation or risk of injury to person or property, Landlord shall be entitled to notify Tenant of its intention to cure such default, and if Tenant fails to immediately take action to effect such cure, Landlord shall be entitled to cure such default and Tenant shall reimburse Landlord for all reasonable costs incurred by Landlord in effecting such cure, including reasonable attorney's fees incurred.

Section 11.3 - Default by Landlord. If Landlord shall fail to observe or perform any provision hereof and such failure shall continue for twenty (20) days after notice to Landlord of such failure, then a Default of Landlord shall exist under this Lease, provided, however, that in

the case of any such failure which cannot with diligence be cured within such twenty (20) day period, if Landlord shall commence promptly to cure the same and thereafter prosecute the curing thereof with diligence, the time within which such failure may be cured shall be extended for such period as is necessary to complete the curing thereof with diligence, unless such Default of Landlord would cause Tenant to be in default, beyond applicable notice and cure periods, under a sublease, in which event Landlord shall not have any longer cure period than twenty (20) days prior to the end of such cure period given to Tenant under the applicable sublease, provided that Tenant informs Landlord in writing of the length of such cure period. Tenant shall have the right to cure any Default of Landlord and offset the cost of such cure from Rent due hereunder; provided that any such offset from Rent shall not exceed fifty percent (50%) of the then applicable monthly installment(s) of Rent due and payable by Tenant, which deductions from rent by Tenant shall not constitute a default by Tenant unless Tenant shall fail to pay the amount of such deduction within thirty (30) days after final adjudication that such amount is owing to Landlord and all appeal periods have expired without the filing of an appeal.

If a Default of Landlord shall have occurred and be continuing, and Landlord fails to cure any such Default within five (5) days after the date of an additional written notice from Tenant to Landlord, Tenant may terminate this Lease by giving Landlord notice of Tenant's intention to do so. Upon the fifteenth (15th) day next succeeding the giving of such notice, this Lease and the estate hereby granted shall expire and terminate on such date as fully and completely and with the same effect as if such date were the date herein fixed with the expiration of the Term of this Lease, and Rent shall be apportioned as of such date and Landlord shall promptly refund to Tenant any Rent theretofore paid which is allocable to the period subsequent to such date. In addition, Tenant shall have any and all additional remedies available to it at law or in equity.

Section 11.4 - Non-Waiver. The Landlord's or Tenant's failure to act upon breach of any of the covenants of this Lease by the other party shall in no way constitute a waiver of the rights of such party, at any time in the future, to act upon such default; nor shall any such failure to act prevent the Landlord or Tenant from acting in the event of any other or further breach of the other party's covenants. No provision of this Lease shall be deemed to have been waived unless such waiver is in writing signed by the Landlord and Tenant.

~~Section 11.5 - Attorney's Fees. In the event that either party to this Lease brings an action against the other to enforce any covenant of this Lease, including actions for rent or other payments due and actions in summary process, the prevailing party shall be indemnified by the other party against all reasonable legal costs and charges, including reasonable attorney's fees.~~

ARTICLE XII.

Termination and Surrender

Section 12.1 - Condition of Premises. Upon expiration or other termination of this Lease, the Solar Arrays and any related improvements constructed on the Leased Premises shall be removed by Tenant. All trade fixtures and signs, whether by law deemed to be a part of the realty or not, installed by the Tenant at any time or anyone claiming under the Tenant, shall remain the property of the Tenant or persons claiming under the Tenant and may be removed by

the Tenant or anyone claiming under the Tenant at any time or times during the Lease Term. If any such trade fixtures or signs are not removed within sixty (60) days after expiration of the term, they shall be deemed to be abandoned, and Landlord shall have the right to prosecute an action for damages caused in the dimunition of the value of the Leased Premises as a result of the failure of Tenant to remove such improvements and restore the Leased Premises to the condition it was in as of the Commencement Date.

Section 12.2 - Holding Over. If the Tenant remains on the Leased Premises beyond the expiration of the Lease Term or any renewal or extension thereof, without the written consent of the Landlord, such holding over shall be deemed to create a month to month tenancy at a rate equal to one hundred and twenty-five percent (125%) of the monthly Basic Rent, subject to all other terms and conditions of this Lease in effect immediately prior to such expiration, except those relating to the term of this Lease.

ARTICLE XIII.

Right of First Refusal

Throughout the entire Lease Term, Tenant shall have a continuing right of first refusal ("Right of First Refusal") to purchase the Leased Premises in accordance with the terms and conditions set forth below:

(a) Scope of Right of First Refusal. If Landlord receives a bona fide written offer to purchase all or any part of the Landlord's fee interest in the Leased Premises which Landlord intends to accept (the "Offer"), it shall give prompt written notice of the same to Tenant.

(b) Notice. Upon receipt of the Offer, Landlord shall give written notice of the same to Tenant (the "ROFR Notice"), which Notice shall include a copy of the Offer.

(c) Review Period. Tenant shall have the option for a period of thirty (30) days following receipt of ROFR Notice to review the Offer.

(d) Exercise of Option. If Tenant elects to purchase the Landlord's fee interest in the Leased Premises, or so much thereof as shall be subject to the terms of the Offer, Tenant shall give written notice to Landlord of its election to purchase the same, within thirty (30) days after its receipt of Landlord's ROFR Notice, upon all of the same terms and conditions contained in the Offer, subject to the following provisions.

(e) Financial Terms. Notwithstanding the terms of the Offer, the purchase price to Tenant will be net of any brokerage commissions or finder's fees contained in, or resulting from, the proposed sale transmitted with the ROFR Notice. Tenant may waive, at its election, any financing conditions of the Offer. Landlord and Tenant shall execute a contract (the "Contract") reflecting the foregoing terms and provisions within fifteen (15) days of the date of Tenant's exercise of its Right of First Refusal.

(f) Environmental Matters. In the event that any portion of the Leased Premises meets the definition of an "establishment" as defined in the Transfer Act, Conn. General Statutes Sections 22a-134 et seq., Landlord agrees to prepare the appropriate Transfer Act form ("ECAF") and supporting documentation and provide a draft of the same for Tenant's review prior to Closing. Landlord shall sign the ECAF form as the "certifying party" and shall submit the executed ECAF, supporting documentation and filing fee to the Department of Environmental Protection immediately following the Closing. Landlord, at its sole cost and expense, shall be responsible for all of the obligations and responsibilities associated with the Transfer Act filing and shall conduct all of the necessary activities required to close-out the Transfer Act filing. Notwithstanding the foregoing, if Tenant or any subtenant or assignee Tenant has caused any spillage of hazardous materials, Tenant or its assignee shall be the certifying party with regard to and shall be responsible for the remediation of any contamination caused by Tenant, any subtenant or assignee.

(g) Closing. Closing shall occur as set forth in the Offer, but in no event sooner than sixty (60) days following Tenant's notice of its election to exercise its Right of First Refusal.

(h) Assignment. Once Tenant has notified Landlord that it has elected to exercise its Right of First Refusal, Tenant shall have the right to assign its rights under the Contract to any entity owned or controlled by the principals of Tenant. This right of first refusal shall not otherwise be assigned, except in connection with an assignment of this Lease.

(i) Default. In the event Tenant duly exercises its Right of First Refusal and thereafter defaults in entering into the Contract or in closing pursuant to the terms of the Contract, and provided Landlord is not in default of its obligations with respect thereto, then Tenant shall have no further right of first refusal during the remaining term of this Lease and Landlord shall keep all deposits made pursuant to the Contract as liquidated damages as its sole remedy and neither party shall have any further claim against the other with respect to the Contract. In the event Landlord defaults in any of its obligations under this Article XIII, including furnishing the ROFR Notice, entering into the Contract and performing its obligations thereunder, and provided Tenant is not in default of its obligations hereunder, Tenant shall have the option of terminating this Lease or bringing an action for specific performance. Landlord and Tenant further recognize and acknowledge that there is no adequate remedy at law for a breach by Landlord of its obligations hereunder and that specific performance is an appropriate and available remedy to Tenant for a Landlord default hereunder.

(j) Survival of Right of First Refusal. In the event that Tenant fails to exercise its Right of First Refusal within the period herein required, then Landlord shall be free to sell Landlord's fee interest in the Leased Premises, or portion thereof subject to the Offer, to the Offeree and upon the same terms and conditions as set forth in the Offer, and Tenant's rights hereunder regarding a Right of First Refusal shall, upon such sale, be void and of no further effect as it relates to the Offeree; provided that if the closing and transfer of title to the Offeree pursuant to the terms and conditions of the Offer does not occur within six (6) months from the expiration of the period within which Tenant could have exercised its Right of First Refusal, the terms of this Article XIII shall again apply and Landlord will again comply therewith. If any

Offer relates to less than all of the Landlord's fee interest in the Leased Premises, Tenant's Right of First Refusal shall continue and be applicable with respect to any and all remaining portions of Landlord's fee interest in the Leased Premises.

(k) Survival of Lease. This Lease and the Tenant's rights hereunder shall survive any transfer by Landlord of Landlord's fee interest in the Leased Premises.

ARTICLE XIV.

Concluding Provisions

Section 14.1 - Amendments. This Agreement may not be amended, modified, altered or changed in any respect whatsoever except by a further agreement in writing, fully executed by each of the parties hereto.

Section 14.2 - Brokerage. The Landlord and the Tenant hereby represent and agree that they have neither communicated nor dealt with any real estate broker or agent in connection with the Leased Premises or the transaction contemplated herein. The Landlord and the Tenant agree that if either has communicated or dealt with any other real estate broker or agent who makes a claim for commission in connection with this transaction, then the party so communicating or dealing shall indemnify and hold the other party harmless against any costs or expenses, including the cost of defense, resulting from any such claim.

~~Section 14.3 - Joint Effort. Preparation of this Agreement has been a joint effort of the parties, and the resulting document shall not be construed more severely against one of the parties than the other.~~

Section 14.4 - Captions. The captions of this Agreement are for convenience of reference only and in no way define, describe, extend or limit the scope or intent of this Agreement or the intent of any provision hereof.

Section 14.5 - Notice. Any notice, demand, offer or other written instrument ("Notice") required or permitted to be given, made or sent under this Lease shall be in writing, signed by or on behalf of the party giving such Notice and shall be hand delivered or sent, postage prepaid, by Federal Express or similar overnight delivery, or by Registered or Certified Mail, Return Receipt Requested, addressed as follows:

TO LANDLORD: Carl Willis Jr. Et al.
866 Noank Ledyard Road
Mystic, CT 06355

WITH A COPY TO: Rosalie I. Watson
149 Watson Road
Preston, CT 06365

TO TENANT: GRE GACRUX LLC
c/o Greenskies Renewable Energy LLC
10 Main Street, Suite E
Middletown, CT 06457
Attention: Michael Silvestrini
Phone: (860) 398-5390

Any Notice to be given to the estate of any deceased or incompetent person shall be addressed to the personal representative of such deceased or incompetent person at the address of such representative or, if there is no personal representative, to the estate of the deceased or incompetent person at the address set forth in this Section.

Either party may change its address set forth in this Section by giving notice to the other party, and if applicable, to the holder of any leasehold mortgagee, in accordance with this Section, provided, however, that such leasehold mortgagee has provided written notice to the Landlord of its mortgage interest in the leasehold estate of the Tenant created hereunder.

Notice shall be effective upon hand delivery or, if by registered or certified mail or Federal Express or similar overnight delivery, the date of receipt or rejection evidenced on the return receipt.

Section 14.6 - Arbitration. In the event of any dispute concerning the condemnation award proceeds pursuant to Section 8.5 among or between any party bound by the terms of this Agreement, such dispute shall be settled by arbitration at the New London County office of the American Arbitration Association in accordance with the rules of the American Arbitration Association as then existing, and judgment upon the award rendered may be entered in any court having jurisdiction thereof.

Section 14.7 - Notice of Lease. This Lease shall not be recorded, but a Memorandum of Lease conforming to the requirements of Connecticut law shall be recorded. All governmental charges attributable to the execution or recording of this Memorandum shall be paid by the party requiring the recording of this Memorandum.

Section 14.8 - Counterparts. This Agreement shall be executed in one or more copies, each of which shall be deemed an original.

Section 14.9 - Partial Invalidity. The invalidity of one or more of the phrases, sentences, clauses, Sections or Articles contained in this Agreement shall not affect the remaining portions so long as the material purposes of this Agreement can be determined and effectuated. If any portion of this Agreement may be interpreted in two or more ways, one of which would render the portion invalid or inconsistent with the rest of this Agreement, it shall be interpreted to render such portion valid or consistent.

Section 14.10 - Transmittal of Lease. This Lease is transmitted for examination only and does not constitute an offer to lease, and this Lease shall become effective only upon the execution and unconditional delivery thereof by both parties hereto.

Section 14.11 - Connecticut Law. This Agreement shall be governed by, construed and enforced in accordance with the laws of the State of Connecticut.

Section 14.12 - Successors. This Agreement shall be binding upon and inure to the benefit of the parties and to their respective heirs, personal representatives, successors and assigns.

Section 14.13 - Force Majeure. Except as otherwise specifically provided elsewhere in this Lease, in any case where either party is required to do any act (other than Tenant's obligation to pay Basic Rent or Additional Rent), the time for such performance shall be extended by the period of delays caused by fire or other casualty, government regulations, adverse weather conditions, acts of god, terrorism or other causes beyond the reasonable control of such party.

Section 14.14 - Entire Agreement. This Agreement contains the entire understanding of the parties. There are no oral understandings, terms or conditions, and no party has relied upon any representation, express or implied, not contained in this Agreement.

Section 14.15 - Effective Date. This Agreement shall be effective between the parties as of the date this Lease Agreement is executed by Landlord and Tenant.

Section 14.16 - Confidentiality. Landlord and Tenant agree that they and their respective agents and employees will keep the provisions of this Lease in confidence and shall not publish or disclose any of the terms and provisions hereof at any time during the Term. The restrictions contained in this Section shall not apply to disclosures which are required to be made by Landlord or Tenant by law, in connection with litigation, to prospective purchasers, assignees, subtenants, mortgagees, investors, title companies or to their respective accountants, affiliated entities, attorneys and financial institutions.

Signed this 30th day of April, 2016

Witnessed by

Harry B. Heller
Harry B. Heller

Terry L. Konrad
Terry L. Konrad

LANDLORD:
Carl Willis Jr.

Rosalie I. Watson
Rosalie I. Watson, his attorney-in-fact

Harry B. Heller

Terry L. Konrad

Rosalie I. Watson f/k/a Rosalie Irene McGuire, Co-Trustee of the Testamentary Trust Under the Last Will and Testament of Vivian M. Willis

Thomas J. Londregan, Co-Trustee of the Testamentary Trust Under the Last Will and Testament of Vivian M. Willis

TENANT:
GRE GACRUX LLC

By: _____

Its MANAGER, duly authorized

Ryan Urnitz

James DeSantos

STATE OF CONNECTICUT)
) ss.: PRESTON
COUNTY OF NEW LONDON)

The foregoing instrument was acknowledged before me this 3rd day of April, 2016 by Rosalie I. Watson, as attorney-in-fact for Carl Willis, Jr., signer and sealer of the foregoing instrument and acknowledged the same to be her free act and deed as attorney-in-fact aforesaid.

Commissioner of the Superior Court
Notary Public Harry B. Heller
My Commission Expires on: _____

Witness

Witness

Witness

Witness

Rosalie T. Wilson, Co-Trustee of the Testamentary Trust Under the Last Will and Testament of Vivian M. Wills

Thomas T. Tomlinson, Co-Trustee of the Testamentary Trust Under the Last Will and Testament of Vivian M. Wills

TUNANTIC
GRE GACRUX LLC

By: _____

Its _____, duly authorized

_____

ATE OF CONNECTICUT)
) ss: April 14, 2016
UNTY OF NEW LONDON)

The foregoing instrument was acknowledged before me this 20th day of April, 2016 by Rosalie T. Wilson, as attorney-in-fact for Carl Wills, Jr., signor and seller of the foregoing instrument and acknowledged the same to be his free act and deed as attorney-in-fact aforesaid.

Commissioner of the Superior Court
Notary Public
My Commission Expires

STATE OF CONNECTICUT)
) ss.: Preston
COUNTY OF NEW LONDON)

On this 30th day of April, 2016, before me, the undersigned officer, personally appeared Rosalie I. Watson f/k/a Rosalie Irene McGuire, Co-Trustee of the Testamentary Trust Created Under the Last Will and Testament of Vivian M. Willis, deceased, signer and sealer of the foregoing instrument and acknowledged the execution of the same to be her free act and deed as Co-Trustee aforesaid.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

Commissioner of the Superior Court
Notary Public
My Commission Expires on: _____

STATE OF CONNECTICUT)
) ss.:
COUNTY OF NEW LONDON)

On this ____ day of _____, 2016, before me, the undersigned officer, personally appeared Thomas J. Londregan, Co-Trustee of the Testamentary Trust Created Under the Last Will and Testament of Vivian M. Willis, deceased, signer and sealer of the foregoing instrument and acknowledged the execution of the same to be his free act and deed as Co-Trustee aforesaid.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

_____
Commissioner of the Superior Court
Notary Public
My Commission Expires on: _____

STATE OF CONNECTICUT)
) ss.:
COUNTY OF)

The foregoing instrument was acknowledged before me this 3rd day of MAY, 2016, by MICHAEL SOWESRCAS MANAGER of GRE Gacrux LLC, a Connecticut manager managed limited liability company, on behalf of the limited liability company.

Commissioner of the Superior Court
~~Notary Public~~
~~My Commission Expires on:~~

WILLIAM HERCHEL

EXHIBIT A

Leased Premises

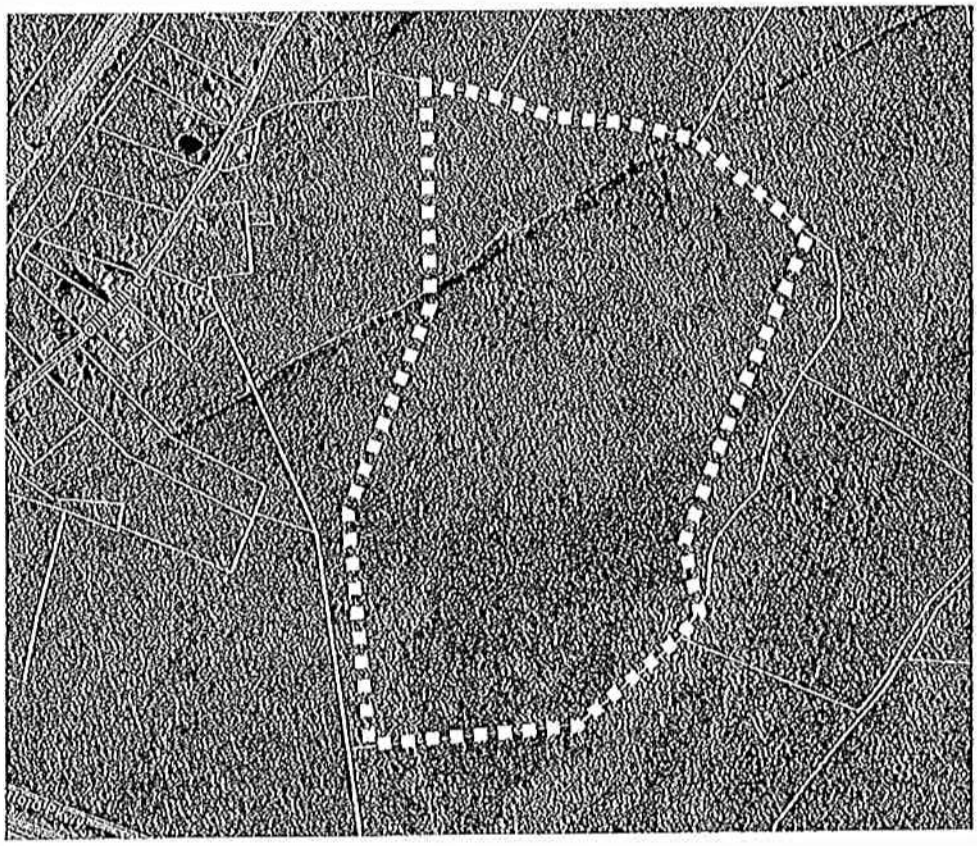


EXHIBIT B
Memorandum of Commencement Date and Lease Term

This Memorandum of Commencement Date and Lease Term is by and between **CARL WILLIS, JR.**, of the Town of Groton, County of New London and State of Connecticut and **ROSALIE I. WATSON F/K/A ROSALIE IRENE MCGUIRE AND THOMAS J. LONDREGAN, CO-TRUSTEES OF THE TESTAMENTARY TRUST ESTABLISHED UNDER THE LAST WILL AND TESTAMENT OF VIVIAN M. WILLIS** ("Landlord") and **GRE _____ LLC**, a Connecticut limited liability company with an address c/o Greenskies Renewable Energy LLC, 10 Main Street, Suite E, Middletown, CT 06457("Tenant").

STATEMENT OF FACTS

A. On _____, 20__, Landlord and Tenant entered into a Ground Lease for that certain piece of land known as _____, _____, _____ containing approximately _____ acres of land ("Lease").

B. Pursuant to Section 1.2 of the Lease, the Landlord and Tenant agreed to execute a memorandum setting forth the Rent Commencement Date and Lease Term.

IT IS AGREED:

1. The Landlord and Tenant agree that the Commencement Date of the Lease is _____, 20___; and that the Initial Term of the Lease shall expire on _____, 20___.

2. The Lease contains a right of first refusal to purchase in favor of the Tenant.

3. Except for the matters set forth herein, the Lease shall be unmodified and remain in full force and effect.

Signed this _____ day of _____, 20__.

Witnessed by:

_____
Print Name:

_____
Print Name:

_____
Print Name:

_____
Print Name:

LANDLORD:
Carl Willis Jr.

By_____
Rosalie I. Watson, his attorney-in-fact, duly authorized

_____
Rosalie I. Watson f/k/a Rosalie Irene McGuire, Co-Trustee of the Testamentary Trust Under the Last Will and Testament of Vivian M. Willis

Print Name:

Print Name:

Print Name:

Print Name:

Thomas J. Londregan, Co-Trustee of the Testamentary Trust Under the Last Will and Testament of Vivian M. Willis

TENANT:
GRE GACRUX LLC

By_____

Its _____, duly authorized

STATE OF CONNECTICUT)
) ss.:
COUNTY OF NEW LONDON)

The foregoing instrument was acknowledged before me this ____ day of April, 2016 by Rosalie I. Watson, as attorney-in-fact for Carl Willis, Jr., signer and sealer of the foregoing instrument and acknowledged the same to be her free act and deed as attorney-in-fact aforesaid.

Commissioner of the Superior Court
Notary Public
My Commission Expires on: _____

STATE OF CONNECTICUT)
) ss.:
COUNTY OF NEW LONDON)

On this ____ day of _____, 2016, before me, the undersigned officer, personally appeared Rosalie I. Watson f/k/a Rosalie Irene McGuire, Co-Trustee of the Testamentary Trust Created Under the Last Will and Testament of Vivian M. Willis, deceased, signer and sealer of the foregoing instrument and acknowledged the execution of the same to be her free act and deed as Co-Trustee aforesaid.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

Commissioner of the Superior Court
Notary Public
My Commission Expires on: _____

STATE OF CONNECTICUT)
) ss.:
COUNTY OF NEW LONDON)

On this ____ day of _____, 2016, before me, the undersigned officer, personally appeared Thomas J. Londregan, Co-Trustee of the Testamentary Trust Created Under the Last Will and Testament of Vivian M. Willis, deceased, signer and sealer of the foregoing instrument and acknowledged the execution of the same to be his free act and deed as Co-Trustee aforesaid.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

_____
Commissioner of the Superior Court
Notary Public
My Commission Expires on: _____

STATE OF CONNECTICUT)
) ss.
COUNTY OF)

The foregoing instrument was acknowledged before me this _____ day of _____, 2016 by _____, _____of GRE Gacrux LLC, a manager-managed limited liability company, on behalf of the limited liability company.

_____

Commissioner of the Superior Court
Notary Public
My Commission Expires: _____

Exhibit C

List of Due Diligence Materials

1. Current rent roll, list of accounts receivable and a list of tenant security deposits; or a written statement that there are none;

2. Access to Seller's tenant correspondence files, which shall include any and all correspondence (including any estoppels) between Seller, its agents and any tenants;

3. Copies of all maintenance and service contracts, all service or supply contracts and any other contracts or agreements related to the Premises, construction projects or repairs in process;

4. Access to copies of all available licenses, permits, maps, approvals, conditions and restrictions with respect to the Premises;

5. Details of all building, health and safety violations, if any within the last three (3) years and a list of all pending or threatened litigation;

6. Copies of the most recent property tax bill, sewer bill, and water bill;

7. Copies of any environmental or engineering reports; and

8. Copies of any existing title insurance policies and surveys, or evidence of ownership of the Property of which the Leased Premises forms a part.

Exhibit D

Title Encumbrances

Exhibit E

Form of Subordination, Nondisturbance and Attornment Agreement

THIS AGREEMENT made as of this _____ day of _____, 20_, by and between _____, whose business address is _____, hereinafter referred to as "**Tenant**", and _____, whose address is _____ _____, hereinafter referred to as "**Mortgagee**".

Reference is made to that certain lease (hereinafter referred to as the "**Lease**") dated _____, 20_, from _____, as Landlord ("**Landlord**"), to Tenant, as tenant of premises at _____, more fully described therein.

Reference is further made to a certain mortgage dated _____, 20__, now held by Mortgagee, as heretofore amended and extended (the "**Mortgage**"), covering the property demised by the Lease, the Mortgage having been recorded in _____.

Tenant and Mortgagee hereby agree as follows:

1. The Lease and the rights of Tenant thereunder are hereby subordinated and shall be and remain subordinated to the Mortgage and the lien thereof, and to any and all extensions, replacements, modifications, consolidations, spreaders and extensions thereof.

2. Mortgagee hereby consents to the Lease and agrees that:

(a) notwithstanding the Mortgage and the lien thereof, or any extension, modification, consolidation, spreader or extension thereof, or any other restriction, lien, encumbrance, right, title or interest now or hereafter held by Mortgagee, or any default, expiration, termination, foreclosure, sale entry or other act or omission under, pursuant to or affecting any of the foregoing, Tenant shall not be disturbed in peaceful enjoyment of the Premises or any rights, privileges and benefits under the Lease terminated or canceled at any time, except in the event Landlord shall have the right to terminate the Lease under the terms and provisions expressly set forth therein.

(b) in the event Mortgagee should succeed to Landlord's rights, title and interest as Landlord under the Lease, Mortgagee will perform, fulfill and observe all of Landlord's representations, warranties and agreements set forth in the Lease while it is Landlord thereunder.

3. In the event of a foreclosure of the Mortgage, Tenant agrees to attorn to and recognize the purchaser at the foreclosure sale as Landlord under the Lease for the balance of the then remaining term of the Lease subject to all of the terms and provisions of the Lease.

4. The agreements contained herein shall bind and inure to the benefit of the successors and assigns in interest of the parties hereto, and, without limitation of the foregoing

generality, the agreements of Mortgagee herein shall specifically be binding upon any purchaser or successor of said property at a sale foreclosing said Mortgage or in lieu of such foreclosure.

5. If the loan made by Mortgagee is secured by a deed of trust or security deed rather than a mortgage, all reference herein to Mortgage shall be construed as referred to such other type of security interest.

IN WITNESS WHEREOF, the parties hereof have caused the execution hereof as of the day and year first above written.

Attest: _____

_____ By: _____

Vice President

Attest: **MORTGAGEE:**

_____ By: _____

AGREEMENT TO GRANT EASEMENT

WHEREAS, CARL WILLIS JR. AND ROSALIE I. WATSON F/K/A ROSALIE IRENE MCGUIRE AND THOMAS J. LONDREGAN, CO-TRUSTEES OF THE TESTAMENTARY TRUST ESTABLISHED UNDER THE LAST WILL AND TESTAMENT OF VIVIAN M. WILLIS (hereinafter referred to as "Grantor") own a certain piece or parcel of land located at 117 Oil Mill Road, in the Town of Waterford, Connecticut, which property is more particularity described in Schedule "A" attached hereto; and

WHEREAS, GRE GACRUX LLC (hereinafter referred to as "Grantee") intends to construct a solar renewable energy farm (hereinafter referred to as the "Solar Farm") on a portion of the property, which parcel of land is described in Schedule "B" attached hereto; and

WHEREAS, said land of the Grantee does not have frontage on a Town road or State highway for access to it; and

WHEREAS, physical access to the property can be obtained through a right of way located on land of the Grantor, as more particular shown on a sketch attached hereto as Exhibit A, with said right of way to be not less than twelve (12) feet in width; and

WHEREAS, the parties hereto would like to enter into a contract (the "Agreement") to grant an easement from the Grantor to the Grantee allowing access to the Grantee's land, as more particularly described herein, should all approvals for said Solar Farm be obtained.

NOW THEREFORE, the parties agree as follows:

1. Agreement to Grant Easement. Subject to the terms and conditions herein, the Grantor agrees to execute and grant a certain easement to the Grantee in a form substantially contained in Schedule "C" attached hereto, at such time as is further described herein.

2. Terms of Grant. The easement shall provide for an initial term of twenty (20) years, and shall contain further five (5) year term options, each to be exercised by the Grantee not less than sixty (60) days prior to the expiration of the initial term hereunder.

3. Contingency. The obligation of the Grantee herein shall be contingent upon the Grantee's successful acquisition of real property rights to the parcel of land described in Schedule "B" attached hereto, the acceptance of the Solar Farm project by the State of Connecticut and a relevant utility in accordance with pending Requests for Proposals (RFPs), and the acquisition of all necessary permits and approvals as shall be necessary to construct and operate the Solar Farm on said parcel described in Schedule "B". Grantee shall have two (2) years within which to satisfy the contingencies as herein described, and complete the purchase of the easement as herein described (the "Closing Date"); provided however, that in the event that the Grantee shall be exercising a diligent effort toward completion of all necessary permits and approvals, the Grantee, at its option, may extend the Closing Date until all such necessary permits and approvals have been received and all agencies have rendered final decisions thereon. During such contingency period, the Grantee shall be provided with an access right to the said right of way for purposes of accessing the property described in Schedule "B" for the purposes of testing, inspecting and other purposes as shall reasonably be required to determine the viability of the property described in Schedule "B" for the aforementioned Solar Farm. The Grantee may terminate this Agreement if any of the contingencies shall fail, or if in its reasonable opinion the Solar Farm is not feasible or likely to be permitted, by giving written notice to the Grantor.

4. Grantor's Representation. The Grantor represents that its premises hereunder are free and clear of any encumbrances, and that there are no valid restrictions which would prohibit the grant of the easement as herein contemplated. The easement shall be conveyed free and clear of any encumbrances or restrictions as to its use other then as specifically identified herein.

5. Assignment. The Grantee may assign this Agreement and/or the easement to another company, which it may establish for the specific purpose of constructing, owning and/or operating the Solar Farm on the property described in Schedule "B".

6. Binding Agreement. This Agreement shall bind the parties hereto and/or their successors and/or assigns.

7. Closing. The Grantee may exercise its rights under this Agreement by giving written notice to the Grantor of its intent to close not less than fourteen (14) days prior to a proposed closing date.

8. The Grantee, at its option, may record a notice of this agreement on the Waterford Land Records.

Dated this 27th day of April, 2016.

GRANTORS:
Carl Willis Jr.

Harry B. Heller

Terry L. Konrad

Harry B. Heller

Terry L. Konrad

Rosalie I. Watson, his attorney-in-fact

Rosalie I. Watson f/k/a Rosalie Irene McGuire, Co-Trustee of the Testamentary Trust Under the Last Will and Testament of Vivian M. Willis

Thomas J. Londregan, Co-Trustee of the Testamentary Trust Under the Last Will and Testament of Vivian M. Willis

GRANTEE:
GRE GACRUX LLC

By: _____

Its MANAGER, duly authorized

Ryan Linnes

James Cosentino

Executed this 6th day of April, 2016.

GRANTORS:
Carl Willis Jr.

Roselle J. Watson, Its Attorney-in-Fact

Roselle J. Watson, f/k/a Roselle Irene McGuire, Co-Trustee of the Testamentary Trust Under the Last Will and Testament of Vivian M. Willis

Thomas J. Lonergan, Co-Trustee of the Testamentary Trust Under the Last Will and Testament of Vivian M. Willis

GRANTEE:
ORE/MACRO XI LLC

By: _____

Its _____, duly authorized

STATE OF CONNECTICUT)
) ss.: Preston
COUNTY OF NEW LONDON)

The foregoing instrument was acknowledged before me this 30th day of April, 2016 by Rosalie I. Watson, as attorney-in-fact for Carl Willis, Jr., signer and sealer of the foregoing instrument and acknowledged the same to be her free act and deed as attorney-in-fact aforesaid.

Commissioner of the Superior Court
Notary Public Harry B. Heller
My Commission Expires on: _____

STATE OF CONNECTICUT)
) ss.: Preston
COUNTY OF NEW LONDON)

On this 30th day of April, 2016, before me, the undersigned officer, personally appeared Rosalie I. Watson f/k/a Rosalie Irene McGuire, Co-Trustee of the Testamentary Trust Created Under the Last Will and Testament of Vivian M. Willis, deceased, signer and sealer of the foregoing instrument and acknowledged the execution of the same to be her free act and deed as Co-Trustee aforesaid.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

Commissioner of the Superior Court
Notary Public Harry B. Heller
My Commission Expires on: _____

STATE OF CONNECTICUT)
) ss.:
COUNTY OF NEW LONDON)

On this ____ day of _____, 2016, before me, the undersigned officer, personally appeared Thomas J. Londregan, Co-Trustee of the Testamentary Trust Created Under the Last Will and Testament of Vivian M. Willis, deceased, signer and sealer of the foregoing instrument and acknowledged the execution of the same to be his free act and deed as Co-Trustee aforesaid.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

Commissioner of the Superior Court
Notary Public
My Commission Expires on: _____

STATE OF CONNECTICUT)
) ss.: MIDDLETOWN
COUNTY OF MIDDLESEX)

The foregoing instrument was acknowledged before me this 3RD day of MAY, 2016, by MICHAEL SCHWESTRENE, MANAGER of GRE Gacrux LLC, a Connecticut manager managed limited liability company, on behalf of the limited liability company.

Commissioner of the Superior Court
~~Notary Public~~
~~My Commission Expires on:~~
WILLIAM HERCHEL

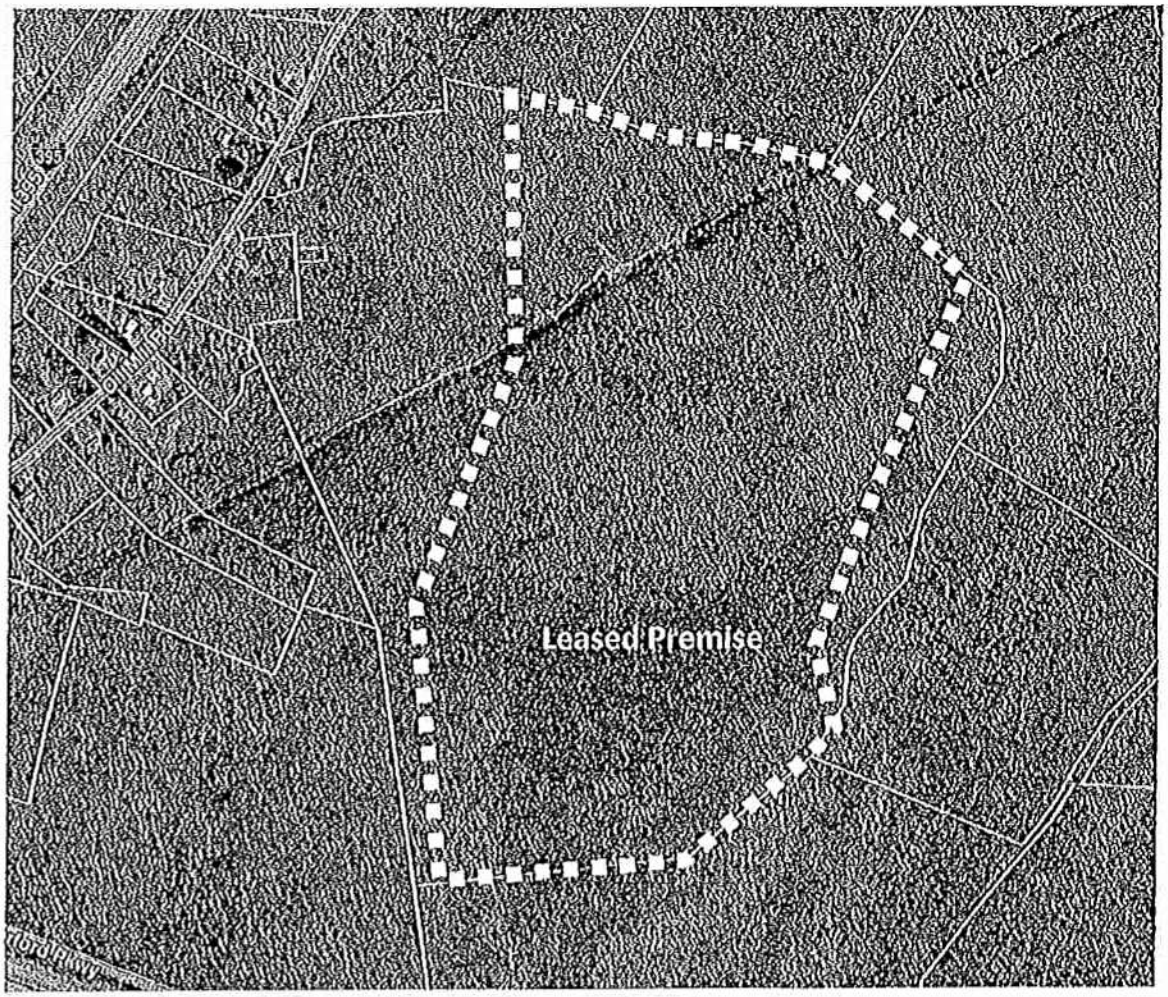
SCHEDULE A

Property ID: 0505200

Town: Waterford

State: Connecticut

SCHEDULE B



SCHEDULE C

Please see attached document.

FIXED TERM EASEMENT/AGREEMENT FOR PASSAGE

KNOW YE BY THESE PRESENTS, CARL WILLIS JR. AND ROSALIE I. WATSON F/K/A ROSALIE IRENE MCGUIRE AND THOMAS J. LONDREGAN, CO-TRUSTEES OF THE TESTAMENTARY TRUST ESTABLISHED UNDER THE LAST WILL AND TESTAMENT OF VIVIAN M. WILLIS agree, bargain and sell unto GRE GACRUX LLC, its successors and/or assigns, the non-exclusive right to pass and repass over a certain right of way (the "Easement") running from Oil Mill Road to land now or formerly of CARL WILLIS JR. AND ROSALIE I. WATSON F/K/A ROSALIE IRENE MCGUIRE AND THOMAS J. LONDREGAN, CO-TRUSTEES OF THE TESTAMENTARY TRUST ESTABLISHED UNDER THE LAST WILL AND TESTAMENT OF VIVIAN M. WILLIS, for the purposes as herein stated.

The land affected by said easement is more particularity bounded and described as follows:

(Legal Description of Wills Parcel)

The land to be leased for which this Easement is necessary to access said parcel is more particularity bounded and described as follows:

(to be acquired by Greenskies Renewable Energy)

The Grantee shall have the right to pass and repass over a right of way not less than twelve (12) feet in width from the said Oil Mill Road by truck or other vehicle, for the purpose of testing, constructing, maintaining, inspecting, operating and other purposes as shall reasonably be required in conjunction with the construction and operation of a solar farm on the parcel described herein. In addition, Grantee shall have the right to use the right of way to extend an electrical connection between the electrical grid and the proposed solar farm, with said electrical connection to be a mix of overhead and underground feeders. To the extent that any maintenance and/or improvements shall be required to make the right of way suitable for the purpose of the Grantee herein, the Grantee shall have the obligation to improve and/or maintain

said right of way for its purposes. The Grantee shall also have the obligation to provide snow plowing as shall be needed for its access.

The term of this agreement shall be for twenty (20) years from the date hereof. In addition, the Grantee, its successors and/or assigns shall have four (4) successive option to renew for a period of five (5) years each, each of said options to be exercised by notifying the Grantor, their successors and/or assigns, on or before the termination date of the original term or any successive option.

The Location of said right of way is shown on a plan entitled "Exhibit A" to be recorded on the Waterford Land records.

[Said Location is generally shown on the photograph attached hereto, subject to final plan to be prepared prior to execution of said easement.]

The Grantor herein reserves the right to himself, his heirs and/or assigns to continue to use the land within which the aforesaid Easement has been granted for any uses and purposes which do not in any way interfere with the use thereof by the Grantee, in fulfilling the purpose for which the Easement is granted.

In witness whereof, I have hereunto set my hand and seal this 20th day of April, 2016.

Harry B. Heller
Harry B. Heller

GRANTORS:
Carl Willis Jr.

Rosalie I. Watson
Rosalie I. Watson, his attorney-in-fact

Mary B. Helle

Rosalie I. Watson f/k/a Rosalie Irene McGuire, Co-Trustee of the Testamentary Trust Under the Last Will and Testament of Vivian M. Willis

Thomas J. Londregan, Co-Trustee of the Testamentary Trust Under the Last Will and Testament of Vivian M. Willis

GRANTEE:
GRE GACRUX LLC

By: _____

Its _____, duly authorized

STATE OF CONNECTICUT)
) ss.: Preston
COUNTY OF NEW LONDON)

The foregoing instrument was acknowledged before me this 30th day of April, 2016 by Rosalie I. Watson, as attorney-in-fact for Carl Willis, Jr., signer and sealer of the foregoing instrument and acknowledged the same to be her free act and deed as attorney-in-fact aforesaid.

Commissioner of the Superior Court
Notary Public Mary B. Helle
My Commission Expires on: _____

STATE OF CONNECTICUT)
) ss.: Preston
COUNTY OF NEW LONDON)

On this 30th day of April, 2016, before me, the undersigned officer, personally appeared Rosalie I. Watson f/k/a Rosalie Irene McGuire, Co-Trustee of the Testamentary Trust Created Under the Last Will and Testament of Vivian M. Willis, deceased, signer and sealer of the foregoing instrument and acknowledged the execution of the same to be her free act and deed as Co-Trustee aforesaid.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

Commissioner of the Superior Court
Notary Public Mary B. Keller
My Commission Expires on: _____

STATE OF CONNECTICUT)
) ss.:
COUNTY OF NEW LONDON)

On this ____ day of _____, 2016, before me, the undersigned officer, personally appeared Thomas J. Londregan, Co-Trustee of the Testamentary Trust Created Under the Last Will and Testament of Vivian M. Willis, deceased, signer and sealer of the foregoing instrument and acknowledged the execution of the same to be his free act and deed as Co-Trustee aforesaid.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

_____
Commissioner of the Superior Court
Notary Public
My Commission Expires on: _____

STATE OF CONNECTICUT)
) ss.:
COUNTY OF)

The foregoing instrument was acknowledged before me this ____ day of _____, 2016, by_____, _____ of GRE Gacrux LLC, a Connecticut manager managed limited liability company, on behalf of the limited liability company.

_____
Commissioner of the Superior Court
Notary Public
My Commission Expires on: _____

EXHIBIT A

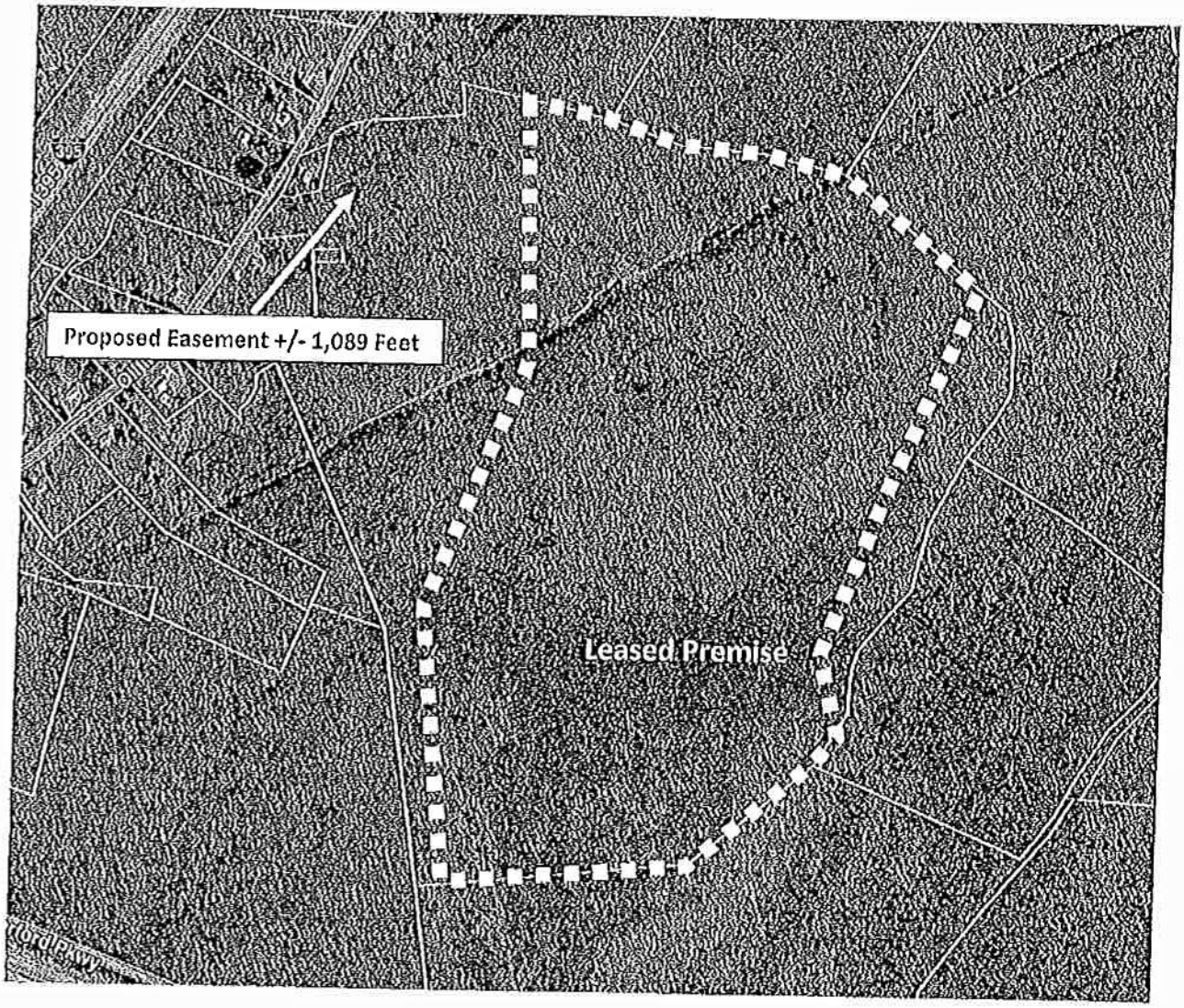
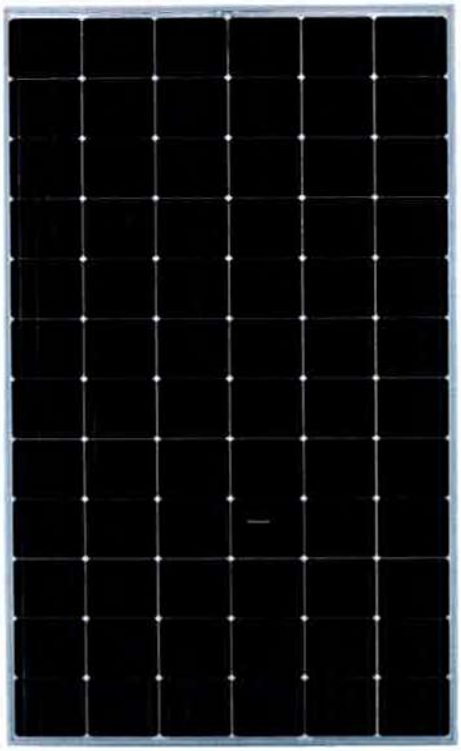


EXHIBIT E

NEO SOLAR POWER

POWER

D6M_E4A
335W - 370W
Mono-Crystalline Photovoltaic Module



Positive power tolerance
0~+4.99 watt

Withstand strong snow load 5400 Pa / wind load 2400 I

Excellent low light performance
3.5% relative eff. reduction at low-irradiance (200W/m²)

100% EL inline inspection
Better module reliability

Ammonia resistance
According to IEC 62716 Ed. 1

TÜVRheinland CERTIFIED
www.tuv.com
ID 0000038214

APPROVED PRODUCT

c UL us LISTED
PHOTOVOLTAIC MODULE
E330639

CE

Reliability & Certification

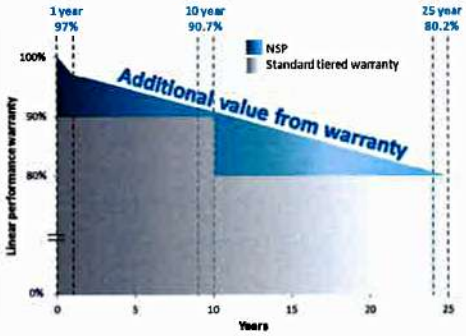
Product guarantee: 10-year

Linear Performance Warranty

- 1-year: 97% power output
  then power degradation 0.7% per year till 25th year
- 25-year: 80.2% power output
- 10-year: 90.7% power output

IEC 61215 / IEC 61730, CE, MCS, UL1703, CEC

* Please refer to NSP product warranty for details



For more information, please visit us at **www.nsp.com**

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Specifications are subject to change without notice.

NSP_1701_Power370_D6M_E4A_WS_v.01

NEO SOLAR POWER

Electrical Data

MODEL	D6M 335 E4A	D6M 340 E4A	D6M 345 E4A	D6M 350 E4A	D6M 355 E4A	D6M 360 E4A	D6M 365 E4A	D6M 370 E4A
Maximum Rating Power (Pmax)	335 W	340 W	345 W	350 W	355 W	360 W	365 W	370 W
Module Efficiency	17.3%	17.5%	17.8%	18.0%	18.3%	18.6%	18.8%	19.1%
Open Circuit Voltage (Voc)	46.04 V	46.16 V	46.61 V	46.89 V	47.16 V	47.44 V	47.67 V	47.81 V
Maximum Power Voltage (Vmpp)	37.47 V	37.57 V	37.96 V	38.34 V	38.63 V	39.01 V	39.38 V	39.40 V
Short Circuit Current (Isc)	9.41 A	9.48 A	9.51 A	9.54 A	9.70 A	9.77 A	9.84 A	9.89 A
Maximum Power Current (Impp)	8.96 A	9.06 A	9.09 A	9.13 A	9.19 A	9.23 A	9.27 A	9.41 A

*Electrical data under Standard Test Conditions (STC): Cell Temperature of 25 °C, Irradiance 1000 W/m², AM 1.5
*Values w/o tolerance are typical numbers
*Specifications subject to change

Mechanical Data

Item	Specification
Dimension	1956mm (L)[1] x 992 mm (W)[1] x 35 mm (D)[2] / 77" (L)[1] x 39.1" (W)[1] x 1.38" (D)[2]
Weight	23 kg / 50.7 lbs
Solar Cell	72 monocrystalline 6" silicon cells
Front Glass	Anti-reflective tempered solar glass, 3.2 mm thickness
Cell Encapsulation	EVA (Ethylene-Vinyl-Acetate)
Back Cover	Composite film, white
Junction Box	IP 67 rated
Frame	Anodized aluminum frame, original or black
Package Configuration	30 pcs per pallet, 660 modules per 40' HQ container

[1] : With assembly tolerance of ± 2 mm [± 0.08"]
[2] : With assembly tolerance of ± 0.8 mm [± 0.03"]

Operating Conditions

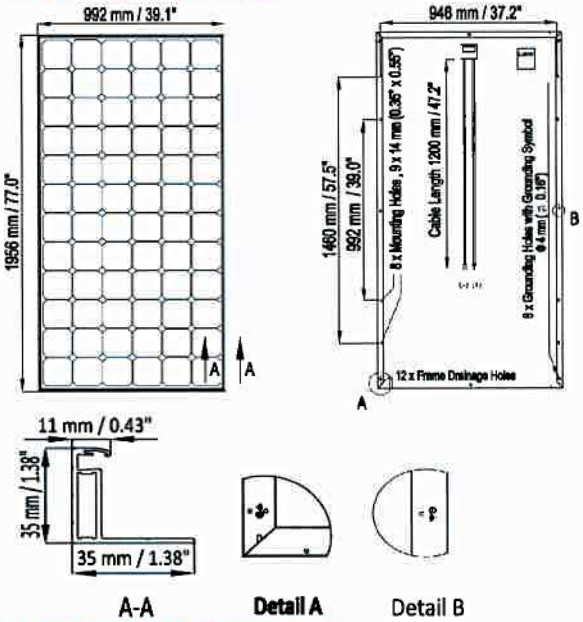
Item	Specification
Mechanical Load	5400 Pa (Certified by TÜV Rheinland)
Maximum System Voltage	DC 1000V
Series Fuse Rating	15 A
Operating Temperature	-40 to 85 °C

Temperature Characteristics

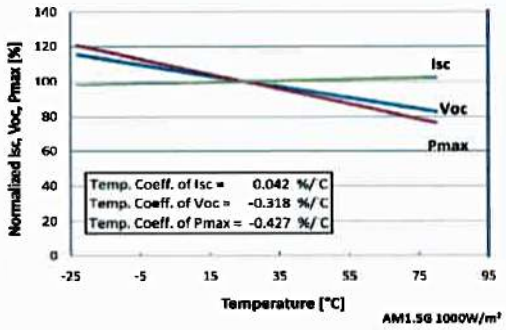
Item	Specification
Nominal Operating Cell Temperature	44 °C ± 2°C
Temperature Coefficient of Isc	0.042 % / °C
Temperature Coefficient of Voc	-0.318 % / °C
Temperature Coefficient of Pmax	-0.427 % / °C

* Nominal Operating Cell Temperature (NOCT): Irradiance 800W/m², Ambient Temperature 20 °C, Wind Speed 1 m/s
* Please refer to NSP's Standard Module Installation Manual before using the product
* Reduction in efficiency from 1000 W/m² to 200 W/m² at 25 °C: 3.5% ± 2 %

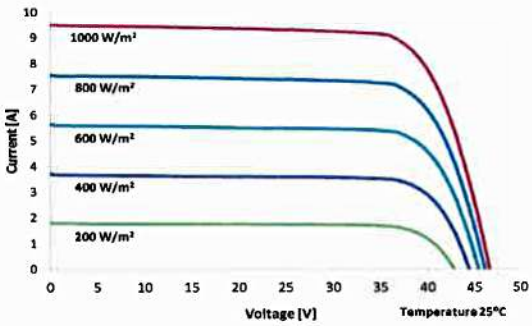
Front View & Back View



Dependence on Temperature



Dependence on Irradiance



Contact Us — www.nsp.com

Neo Solar Power Corporation

Headquarters: 7, Li-Hsin 3rd Rd., Hsinchu Science Park, Hsinchu, 30078, Taiwan

Tel: +886-3-578-0011
Fax: +886-3-578-1255

Email: sales.module@nsp.com
Website: www.nsp.com

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Specifications are subject to change without notice.

EXHIBIT F

RBI SOLAR

Ground Mount Solutions

Driven | Ballasted

DESIGN • ENGINEERING • MANUFACTURING • INSTALLATION

RBI SOLAR

Complete Single-Source Solutions

RBI Solar's ground mount solar systems are designed and engineered for each customer's site specific conditions to minimize the field installation labor by eliminating field welding, drilling, or other on-site fabrication. Our meticulous project planning and precise execution combine to provide you with solar racking solutions that are tailored to the unique conditions of your location while reducing your overall total project costs. RBI provides a wide range of PV mounting systems in various sizes to offer freedom and flexibility to support every type of PV module.

Why choose RBI Solar?

- Single-source solutions aide in reduction of overall total project costs
- Streamlined production process
- Wider selection of component parts
- Higher strength steel with corrosion protection
- Uses less steel without sacrificing strength
- Pre-assembled components available
- Quick response & efficient communication
- Follow contours to mitigate civil/site work
- Nationwide installation services
- ETL Classified to UL Standard 2703
- 20-yr limited warranty
- 85+ years manufacturing experience & bankable financial backing

Ground Mount Solutions

- Customizable, site-specific solutions
- Multiple foundations available
- ETL classified to UL Standard 2703

Ballasted Mounting Solutions

- Two ballast foundation offerings
- Perfect for landfills, brownfields and non-penetrable sites

Design & Engineering

- Licensed in-house engineers
- Structural and foundation design
- Stamped drawings, including foundations
- Code compliance
- On-site pile testing

Manufacturing

- Multiple manufacturing facilities
- National & International capabilities
- ARRA compliant availability

Installation

- Dedicated Project & Construction Managers
- Highly skilled & specialized installation crews
- Company-owned post driving equipment

Our Job is to Make Yours Easier

Single-Source Provider

DESIGN

RBI Solar's in-house designers provides complete structural and foundation design. It is our focus to deliver the most effective and efficient racking solution for each project's site specific conditions.

ENGINEERING

Our licensed in-house engineers incorporate and analyze data from certified geotechnical reports, on-site pile testing and all applicable codes/loading considerations when designing each individual project.

MANUFACTURING

Having multiple state-of-the-art manufacturing facilities with vertical integration and refined manufacturing protocol, ensure RBI Solar delivers on overall quality of product with reduced lead times for material delivery to job sites.

INSTALLATION

RBI Solar provides single-source responsibility with in-house project management and a network of installation crews. Overall project coordination allows RBI Solar to focus on delivering projects on time and within budget.

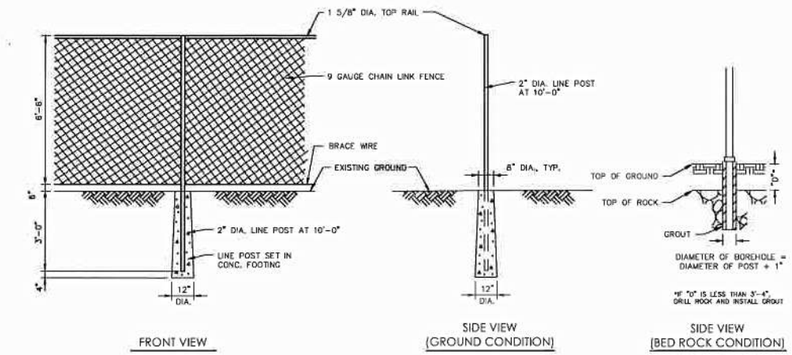
Solar Racking Solutions
from the Industry's Most Trusted Team

Contact us at info@rbisolar.com or (513) 242-2051

www.rbisolar.com

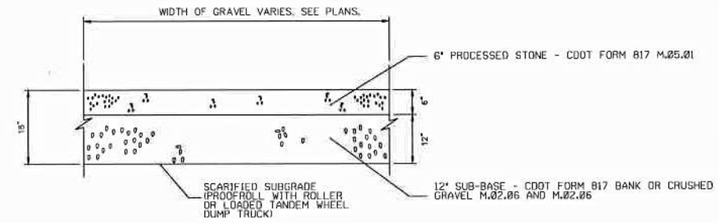
RBI SOLAR

EXHIBIT G



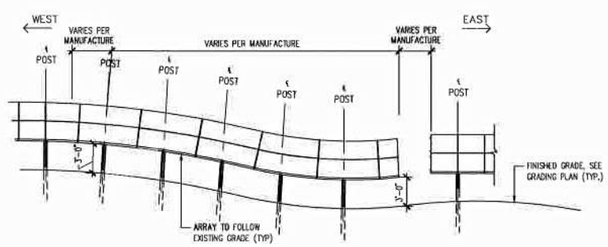
CHAIN LINK FENCE DETAIL

N.T.S

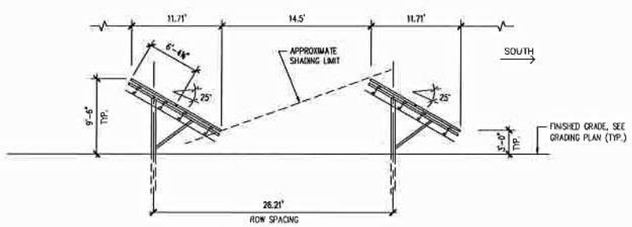


PROPOSED GRAVEL DRIVEWAY

N.T.S



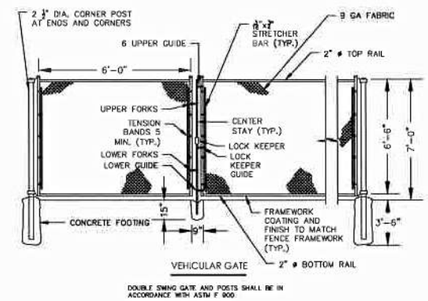
PHOTOVOLTAIC SOUTH ELEVATION -SLOPE VARIES



TYPICAL PHOTOVOLTAIC ROW SPACING

SOLAR PANEL CLUSTER DETAIL

N.T.S



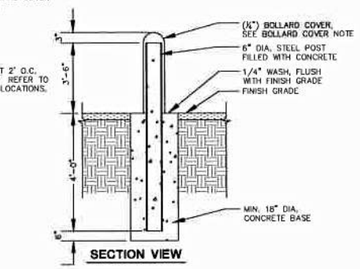
7' HIGH CHAIN LINK FENCE WITH 6' WIDE GATES

N.T.S

BOLLARD COVER NOTE:
MANUFACTURER: IDEALSHIELD®
ADDRESS: 2525 CLARK STREET, DETROIT, MI 48209
PHONE: 1-888-825-8659
MODULE: (¼") 6" BOLLARD COVER
COLOR: DARK GREEN
HEIGHT: 42"

OR APPROVED EQUAL

LAYOUT NOTE:
SPACE BOLLARDS 4' O.C., OFFSET 2' O.C. FROM EDGE OF CONCRETE PADS. REFER TO SE SERIES PLANS FOR BOLLARD LOCATIONS.



BOLLARD AT CONCRETE PADS

N.T.S

GENERAL NOTES

DESIGNED IN ACCORDANCE WITH THE CONNECTICUT STATE BUILDING CODE, CONSISTING OF THE 2003 IBC WITH STATE AMENDMENTS.

IF ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THESE DRAWINGS AND/OR CONDITIONS SPECIFIED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH THE AFFECTED WORK.

TYPICAL DETAILS AND NOTES SHOWN HEREIN SHALL APPLY UNLESS SPECIFICALLY SHOWN OR NOTED OTHERWISE. CONSTRUCTION DETAILS NOT FULLY SHOWN OR NOTED SHALL BE SIMILAR TO DETAILS SHOWN FOR SIMILAR CONDITIONS.

ALL UNDERGROUND UTILITY LOCATIONS SHALL BE VERIFIED PRIOR TO STARTING EXCAVATION WORK. CALL BEFORE YOU DIG (ONE-CALL) 72 HOURS MINIMUM PRIOR TO STARTING ANY EXCAVATION AT 811.

WORK AREAS SHALL BE MARKED, FENCED, AND OTHERWISE SECURED SO AS TO PROVIDE PROPER PROTECTION FOR THE PUBLIC, AND AS REQUIRED BY THE BUILDING INSPECTOR.

CONCRETE PAD DESIGN BASED ON PRESUMPTIVE BEARING VALUES OF THE ANTICIPATED SOILS.

RACKING LOADS:
PROPOSED RACKING SHALL BE DESIGNED BY THE RACKING MANUFACTURER, UTILIZING THE FOLLOWING LOADS:

PROPOSED SOLAR MODULES - 2.5 POUNDS PER SQUARE FOOT

SNOW LOADS:
GROUND SNOW LOAD = 30 PSF (PER CT SUPPLEMENT)
FLAT ROOF SNOW LOAD = 30 PSF (MIN. PER CT SUPPLEMENT)
SLOPED ROOF SNOW LOAD - PER ASCE 7-10
UNBALANCED SNOW LOAD - PER ASCE 7-10

WIND LOADS:
BASIC WIND SPEED (3-SEC. GUST) = 125 MPH (CT AMMENDMENT)
IMPORTANCE FACTOR = 1.0
EXPOSURE = "C"

SEISMIC LOADS:
SEISMIC CATEGORY "B"

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

FOR PERMITTING PURPOSES ONLY NOT RELEASED FOR CONSTRUCTION

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Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

No.	REVISIONS Date	Desc.

Designed	H.J.L.
Drawn	H.J.L.
Reviewed	
Scale	NONE
Project No.	17D3515
Date	07/30/2018
CAD File	DN17D3515D1

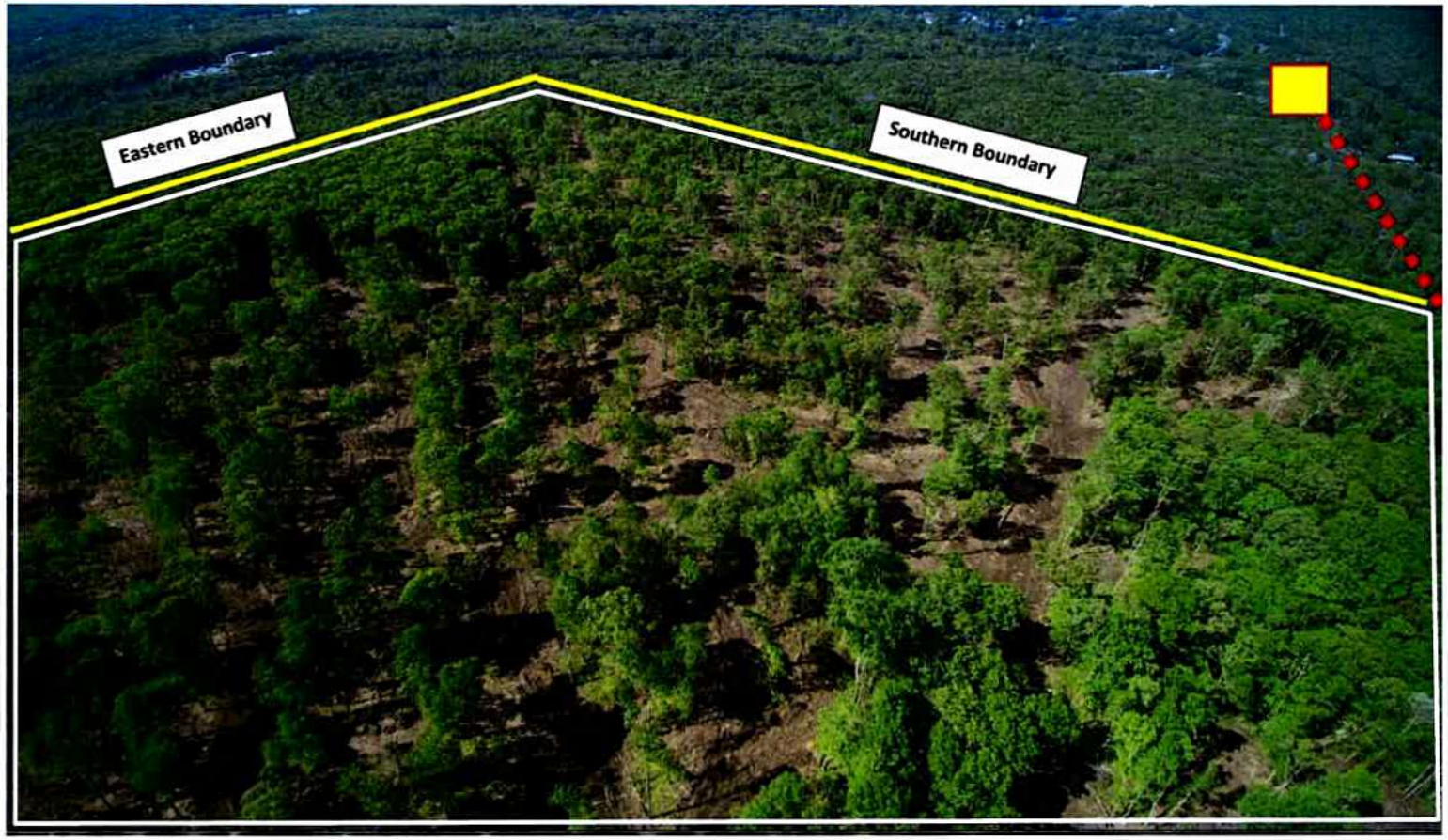
Title
DETAILS SHEET

Sheet No.
DN-1

EXHIBIT H

Greenskies
a Clean Focus company

PRE CONSTRUCTION SITE CONDITIONS
TREE HARVEST DRONE IMAGE 5-15-18 (20% OF HARVEST COMPLETE)



Substation

Eversource Transmission Easement

Drone Shot Taken on 5-15-2018. Lumber Harvest is at 20% completion in this picture.

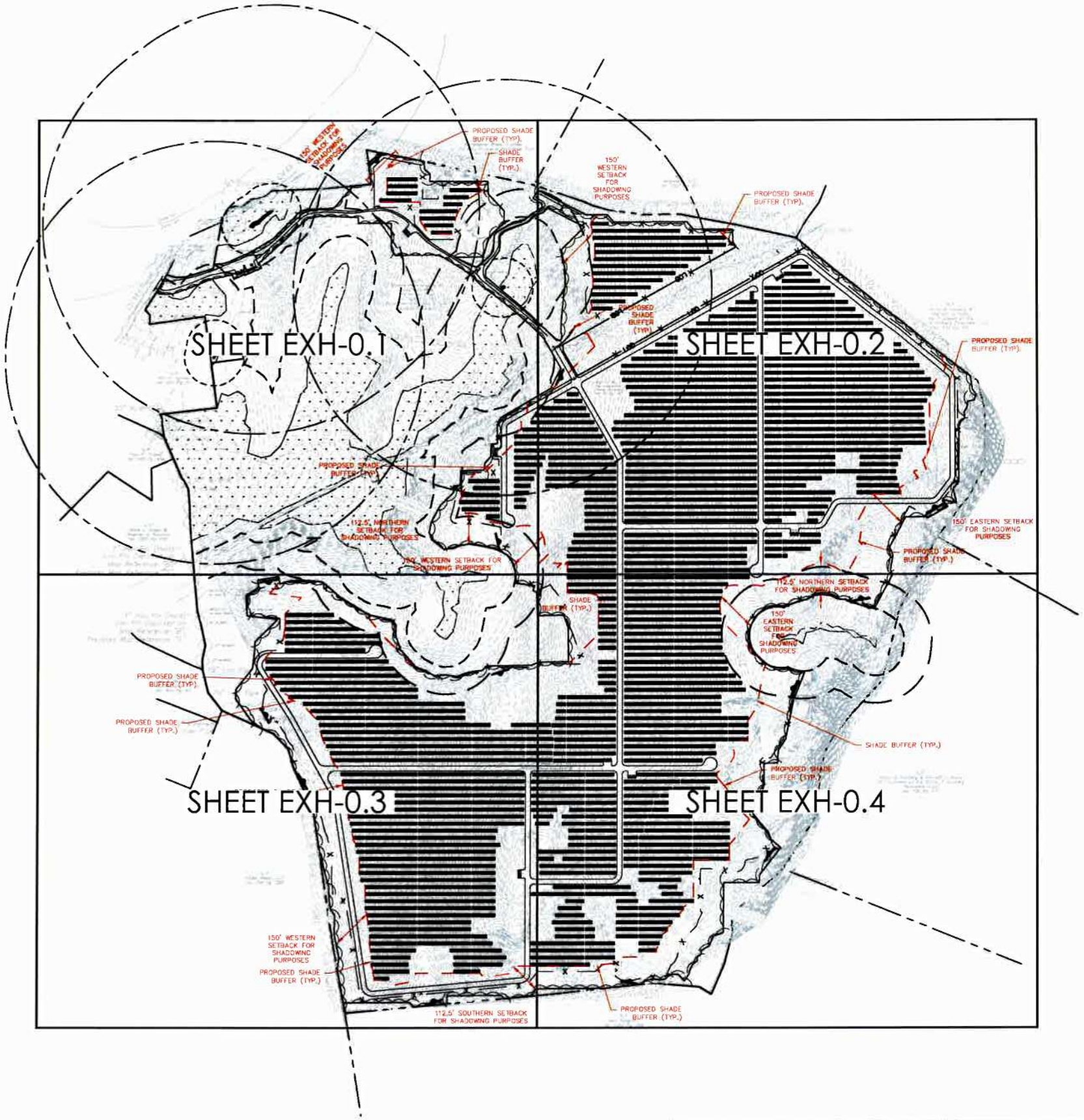
180 Johnson St
Middletown, CT 06457

Greenskies
a Clean Focus company

PRE CONSTRUCTION SITE CONDITIONS
TREE HARVEST DRONE IMAGE 5-15-18 (20% OF HARVEST COMPLETE)

180 Johnson St
Middletown, CT 06457

EXHIBIT I



REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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GRAPHIC SCALE
200 100 0 200
SCALE IN FEET

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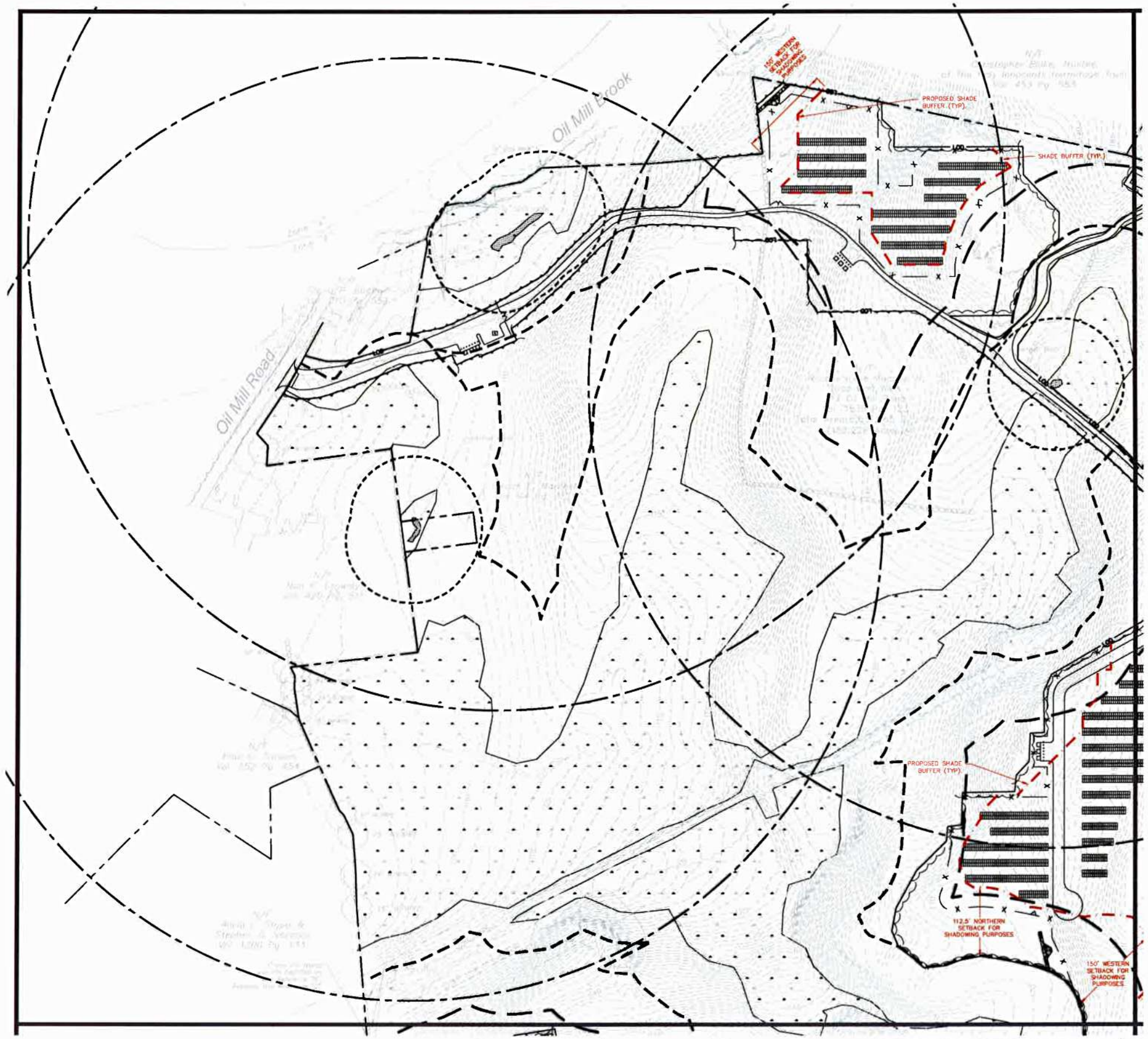
PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=200'
Project No. 17032615
Date 07/30/2018
CAD File 17032615LD-SHADE BUFFER QUADRANT

Title
OVERALL SHADE BUFFER EXHIBIT-QUADRANT PLAN

Sheet No.
EXH-0.0



MATCHLINE - SEE SHEET EXH-0.2

MATCHLINE - SEE SHEET EXH-0.3

LEGEND

- PROPERTY LINE
- EXISTING EASEMENT
- LIMITS OF DISTURBANCE/CONTRACT LIMIT LINE — LOD
- GROUND MOUNTED PHOTOVOLTAIC (PV) MODULES
- EXISTING WETLANDS
- 50'-100' WETLAND BUFFER (UNDISTURBED)
- 200' WETLAND BUFFER (REFER TO LANDSCAPING PLANS FOR CLEARING LIMITS AND PROPOSED PLANTINGS WITHIN BUFFER)
- EXISTING VERNAL POOL
- 100' VERNAL POOL ENVELOPE (VPE)
- 750' CRITICAL TERRESTRIAL HABITAT (CTH)
- EXISTING DIRT ACCESS ROAD
- BOLLARDS
- CONCRETE PAD (ELECTRIC UNIT)
- PROPOSED GRAVEL ACCESS ROAD
- BITUMINOUS DRIVEWAY APRON
- PROPOSED 7' HIGH CHAIN LINK FENCE
- PROPOSED TREE LINE

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

FOR PERMITTING PURPOSES ONLY NOT RELEASED FOR CONSTRUCTION

GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

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Land Surveying
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Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=60'
Project No. 1703515
Date 07/30/2018
CAD File 1703515-SHADE BUFFER QUADRANT

Title
OVERALL SHADE BUFFER EXHIBIT - QUADRANT PLAN

Sheet No.
EXH-0.1

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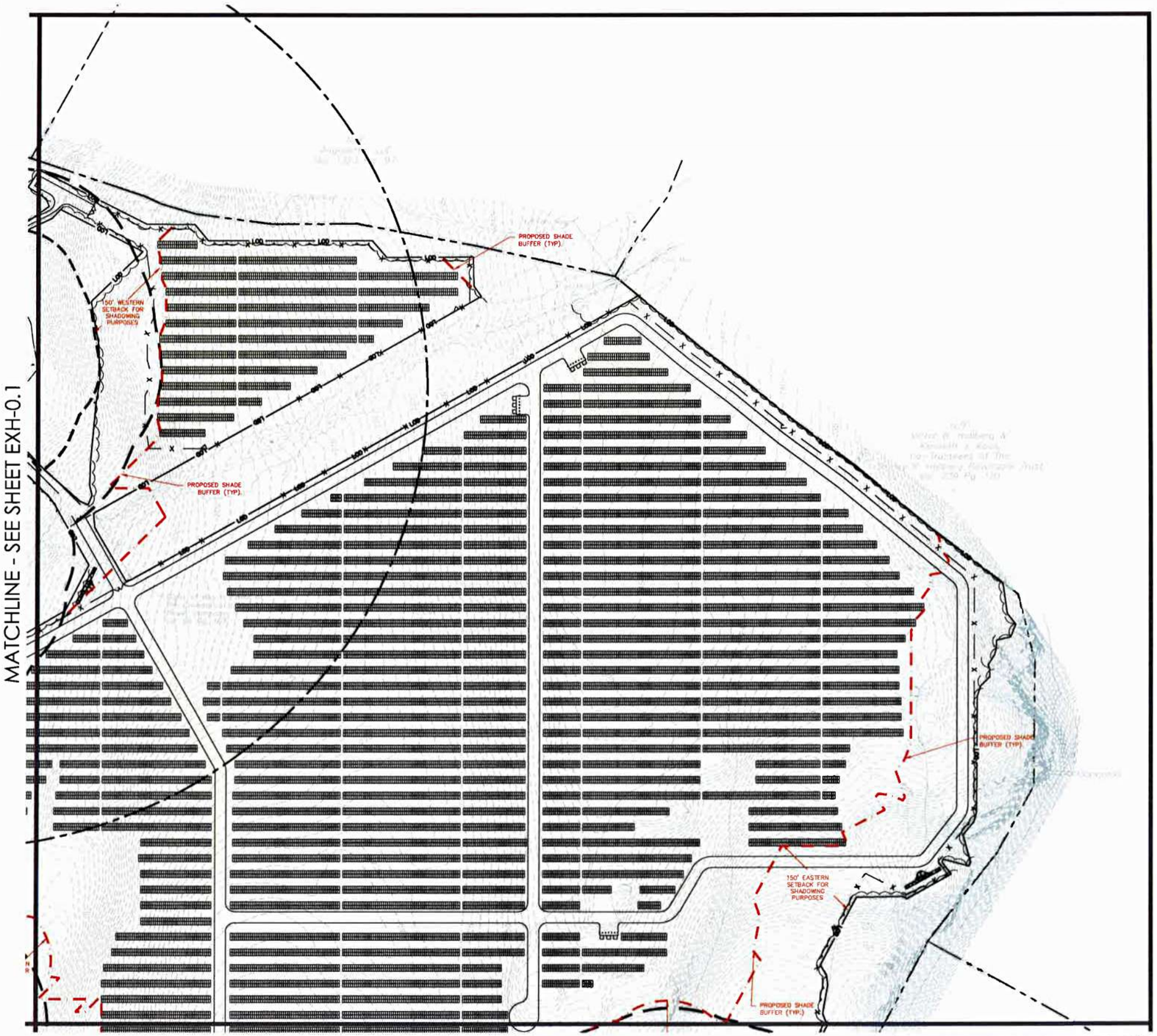
MATCHLINE - SEE SHEET EXH-0.1



MATCHLINE - SEE SHEET EXH-0.4

LEGEND

- PROPERTY LINE
- EXISTING EASEMENT
- LIMITS OF DISTURBANCE/CONTRACT LIMIT LINE
- GROUND MOUNTED PHOTOVOLTAIC (PV) MODULES
- EXISTING WETLANDS
- 50'–100' WETLAND BUFFER (UNDISTURBED)
- 200' WETLAND BUFFER (REFER TO LANDSCAPING PLANS FOR CLEARING LIMITS AND PROPOSED PLANTINGS WITHIN BUFFER)
- EXISTING VERNAL POOL
- 100' VERNAL POOL ENVELOPE (VPE)
- 750' CRITICAL TERRESTRIAL HABITAT (CTH)
- EXISTING DIRT ACCESS ROAD
- BOLLARDS
- CONCRETE PAD (ELECTRIC UNIT)
- PROPOSED GRAVEL ACCESS ROAD
- BITUMINOUS DRIVEWAY APRON
- PROPOSED 7' HIGH CHAIN LINK FENCE
- PROPOSED TREE LINE

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

FOR PERMITTING PURPOSES ONLY NOT RELEASED FOR CONSTRUCTION

GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

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Environmental
Land Surveying
BL Companies
355 Research Parkway
Meriden, CT 06450
(203) 630 1406
(203) 630 2615 Fax

PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

Designed H.J.L.
Drawn H.J.L.
Reviewed
Date 1"=80'
Project No. 170355
Date 01/30/2018
CAD File 170355SD-SHADE BUFFER QUADRANT

OVERALL SHADE BUFFER EXHIBIT - QUADRANT PLAN

Sheet No.
EXH-0.2

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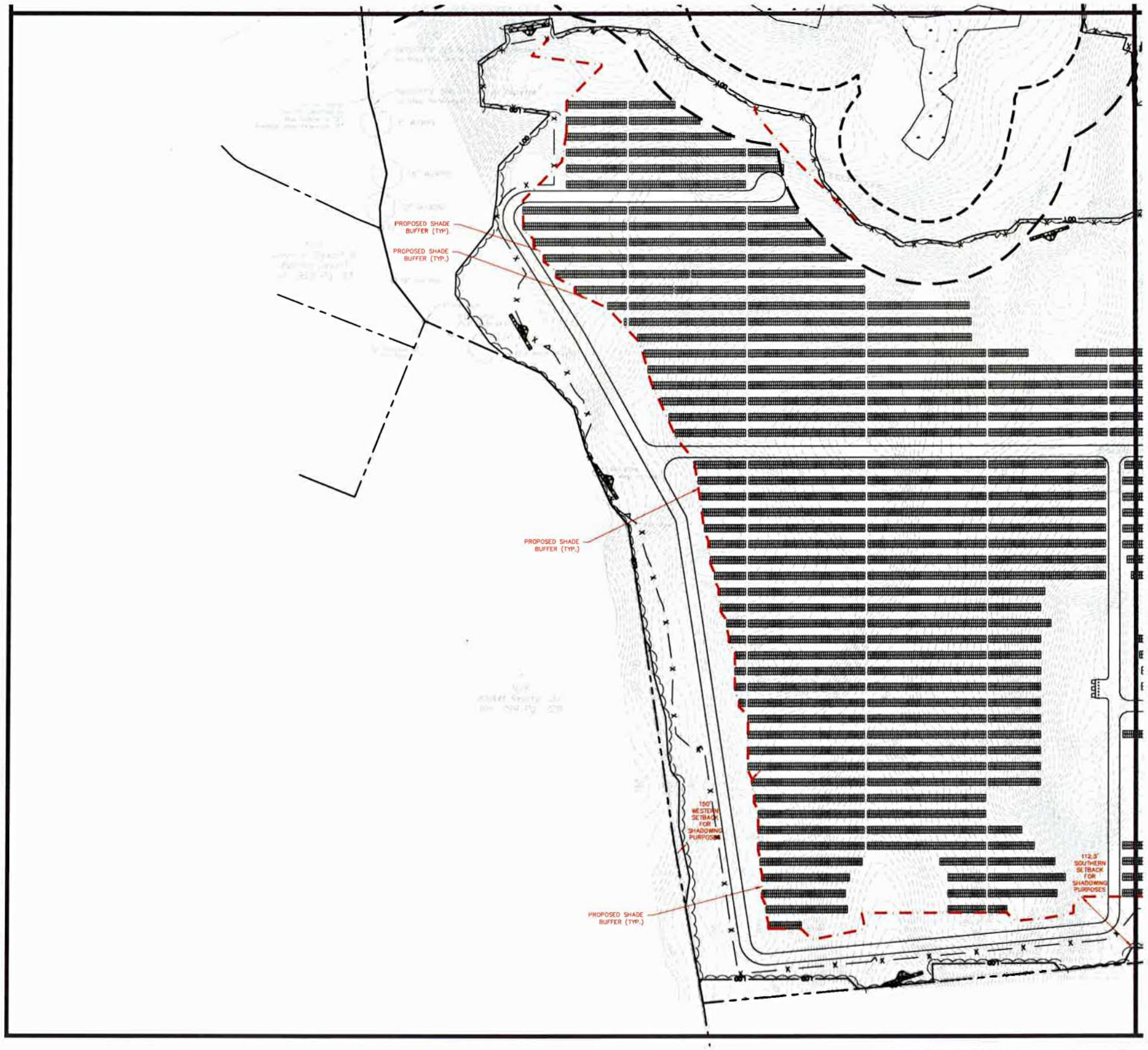
MATCHLINE - SEE SHEET EXH-0.1



MATCHLINE - SEE SHEET EXH-0.4

LEGEND

- PROPERTY LINE
- EXISTING EASEMENT
- LIMITS OF DISTURBANCE/CONTRACT LIMIT LINE (LOD)
- GROUND MOUNTED PHOTOVOLTAIC (PV) MODULES
- EXISTING WETLANDS
- 50'-100' WETLAND BUFFER (UNDISTURBED)
- 200' WETLAND BUFFER (REFER TO LANDSCAPING PLANS FOR CLEARING LIMITS AND PROPOSED PLANTINGS WITHIN BUFFER)
- EXISTING VERNAL POOL
- 100' VERNAL POOL ENVELOPE (VPE)
- 750' CRITICAL TERRESTRIAL HABITAT (CTH)
- EXISTING DIRT ACCESS ROAD
- BOLLARDS
- CONCRETE PAD (ELECTRIC UNIT)
- PROPOSED GRAVEL ACCESS ROAD
- BITUMINOUS DRIVEWAY APRON
- PROPOSED 7' HIGH CHAIN LINK FENCE
- PROPOSED TREE LINE

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

FOR PERMITTING PURPOSES ONLY NOT RELEASED FOR CONSTRUCTION

GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

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Engineering
Environmental
Land Surveying
BL Companies
355 Research Parkway
Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=80'
Project No. 170.3515
Date 07/30/2018
CAD File 703515GS-SHADE BUFFER QUADRANT

Title
OVERALL SHADE BUFFER EXHIBIT - QUADRANT PLAN

Sheet No.
EXH-0.3

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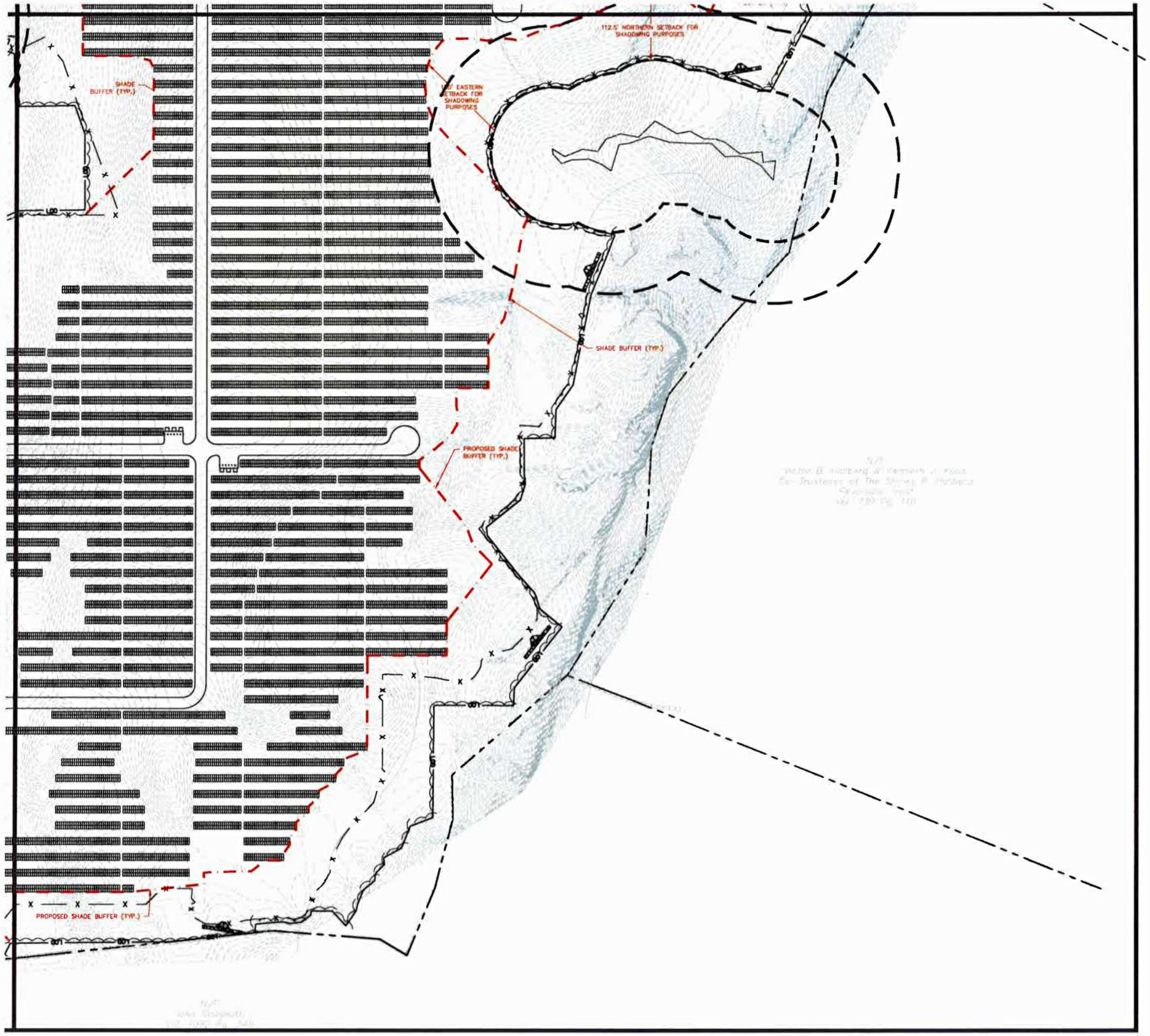
MATCHLINE - SEE SHEET EXH-0.2

MATCHLINE - SEE SHEET EXH-0.3



LEGEND

- PROPERTY LINE
- EXISTING EASEMENT
- LIMITS OF DISTURBANCE/CONTRACT LIMIT LINE
- GROUND MOUNTED PHOTOVOLTAIC (PV) MODULES
- EXISTING WETLANDS
- 50'-100' WETLAND BUFFER (UNDISTURBED)
- 200' WETLAND BUFFER (REFER TO LANDSCAPING PLANS FOR CLEARING LIMITS AND PROPOSED PLANTINGS WITHIN BUFFER)
- EXISTING VERNAL POOL
- 100' VERNAL POOL ENVELOPE (VPE)
- 750' CRITICAL TERRESTRIAL HABITAT (CTH)
- EXISTING DIRT ACCESS ROAD
- BOLLARDS
- CONCRETE PAD (ELECTRIC UNIT)
- PROPOSED GRAVEL ACCESS ROAD
- BITUMINOUS DRIVEWAY APRON
- PROPOSED 7' HIGH CHAIN LINK FENCE
- PROPOSED TREE LINE

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

FOR PERMITTING PURPOSES ONLY
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GRAPHIC SCALE
80 40 0 80
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Environmental
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BL Companies

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(203) 630-2615 Fax

PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=80'
Project No. 170395
Date 07/30/2018
CAD File

Title
OVERALL SHADE BUFFER EXHIBIT - QUADRANT PLAN

Sheet No.
EXH-0.4

LEGEND

- TREES TO BE REMOVED (91.38 ACRES)
- STUMPS TO REMAIN (8.13 ACRES)
- TREES TO REMAIN (51.43 ACRES)

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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PHOTOVOLTAIC INSTALLATION

117 OIL MILL ROAD
WATERFORD, CONNECTICUT

REVISIONS
1
2
3
4

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=200'
Project No. 170381S
Date 07/26/2018
CAD File EXHIT03381S-2-CLEAR ANALYSIS

Title
CLEARING EXHIBIT

Sheet No.
EXH-2

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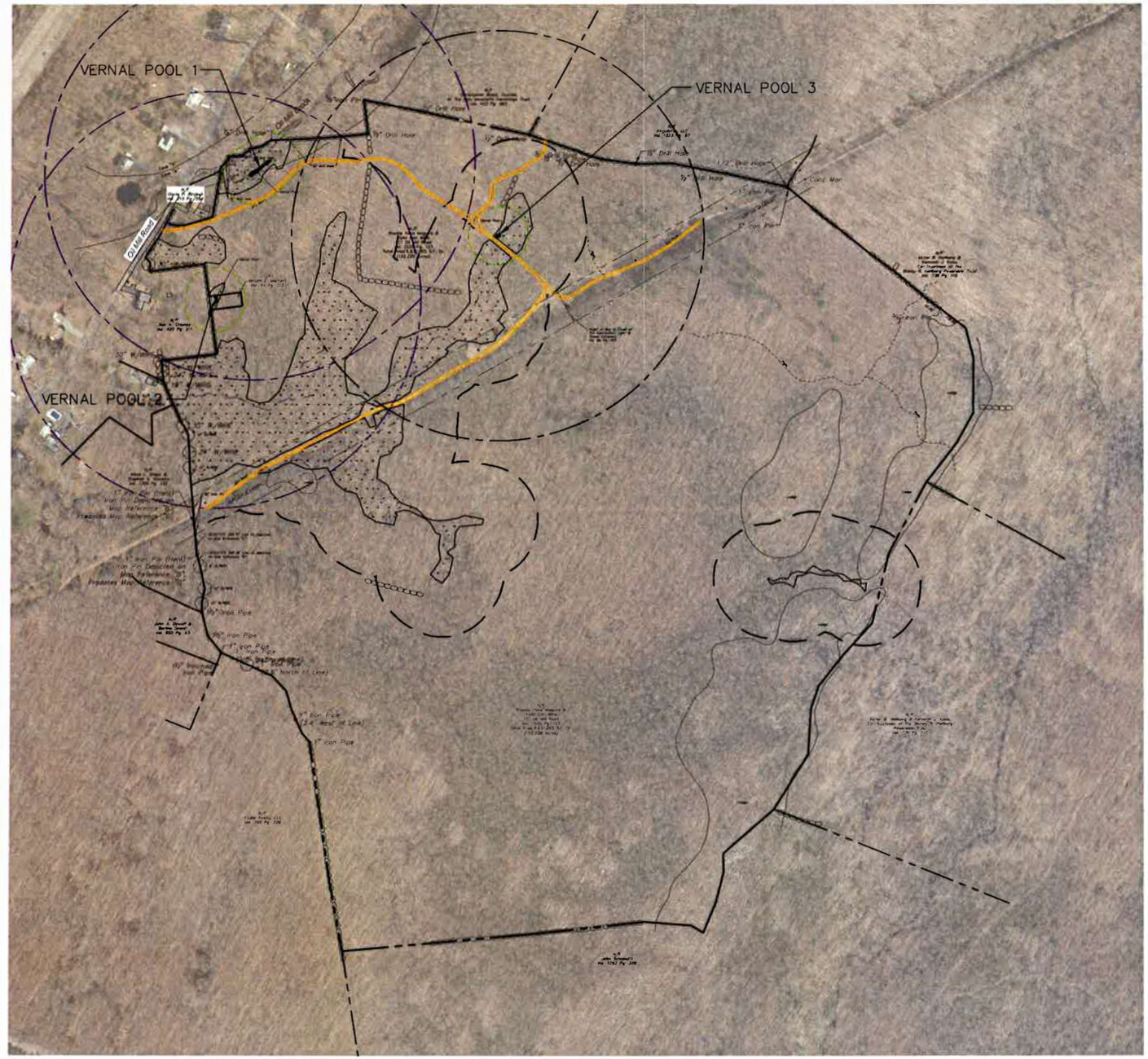
EXHIBIT J

LEGEND

- PROPERTY LINE
- EXISTING EASEMENT
- LIMITS OF DISTURBANCE/CONTRACT LIMIT LINE — LOD
- GROUND MOUNTED PHOTOVOLTAIC (PV) MODULES
- EXISTING WETLANDS
- 50'–100' WETLAND BUFFER (UNDISTURBED)
- 200' WETLAND BUFFER (REFER TO LANDSCAPING PLANS FOR CLEARING LIMITS AND PROPOSED PLANTINGS WITHIN BUFFER)
- EXISTING VERNAL POOL
- 100' VERNAL POOL ENVELOPE (VPE)
- 750' CRITICAL TERRESTRIAL HABITAT (CTH)
- EXISTING DIRT ACCESS ROAD
- BOLLARDS
- CONCRETE PAD (ELECTRIC UNIT)
- PROPOSED GRAVEL ACCESS ROAD
- BITUMINOUS DRIVEWAY APRON
- PROPOSED 7' HIGH CHAIN LINK FENCE — X — X —
- PROPOSED TREE LINE
- EXISTING DEVELOPMENT WITHIN VERNAL POOL BUFFERS



REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

REVISIONS
No. Date Description

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=200'
Project No. 170.3515
Date 07/30/2018
CAD File: EXH170.3515.3.1&3.2

Title
PRE-DEVELOPMENT
VERNAL POOL EXHIBIT

Sheet No.
EXH-3.1

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LEGEND

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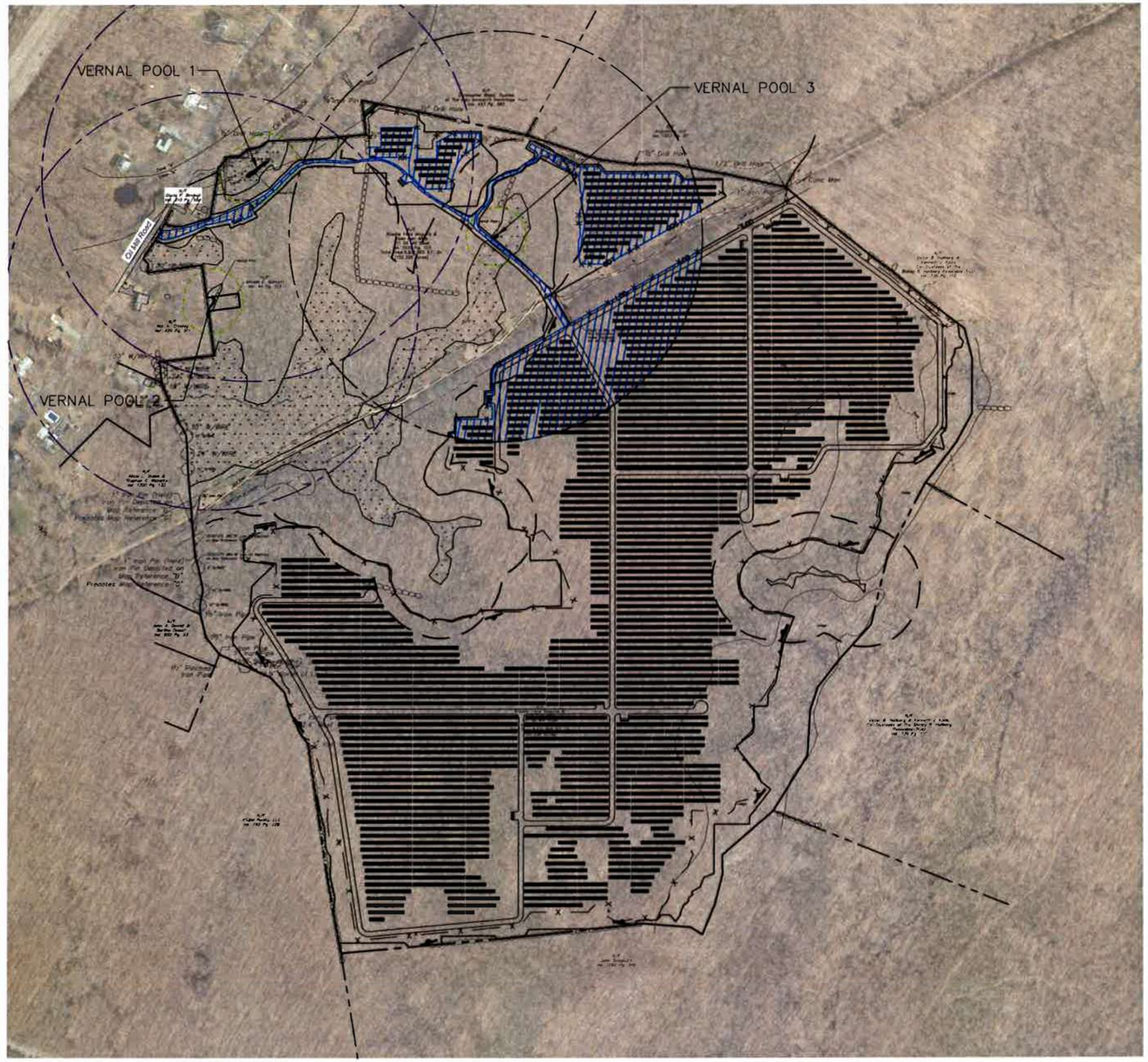
- BOLLARDS
- CONCRETE PAD (ELECTRIC UNIT)
- PROPOSED GRAVEL ACCESS ROAD
- BITUMINOUS DRIVEWAY APRON
- PROPOSED 7' HIGH CHAIN LINK FENCE — X — X —
- PROPOSED TREE LINE
- PROPOSED DEVELOPMENT WITHIN VERNAL POOL BUFFERS

	TOTAL AREA (S.F.)		DEVELOPED AREAS (S.F.)			
	VPE	CTH	VPE (PRE)	VPE (POST)	CTH (PRE)	CTH(POST)
VERNAL POOL 1	54,120	1,929,923	2,077	2,466	10,047	79,203
% DEVELOPED			3.84%	4.56%	0.52%	4.10%
VERNAL POOL 2	41,665	1,840,828	0	0	6,845	14,147
% DEVELOPED			0.00%	0.00%	0.37%	0.77%
VERNAL POOL 3	37,035	1,808,020	2,508	2,508	26,902	449,804
% DEVELOPED			6.77%	6.77%	1.49%	24.88%

NOTE:
1. THE ANALYSIS ABOVE COMPARES THE PRE-DEVELOPMENT AND POST-DEVELOPMENT CONDITIONS WITHIN THE SUBJECT PARCEL PROPERTY BOUNDARY ONLY. ANY EXISTING OR PROPOSED DEVELOPMENT OFFSITE HAS NOT BEEN INCLUDED IN THIS ANALYSIS.



REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

No.	Revisions	Date

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=200'
Project No. 1703515
Date 07/30/2018
CAD File EXH1703515.3.1&3.2

Title
POST-DEVELOPMENT VERNAL POOL EXHIBIT

Sheet No.
EXH-3.2

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EXHIBIT K

Slopes Table			
Number	Minimum Slope	Maximum Slope	Color
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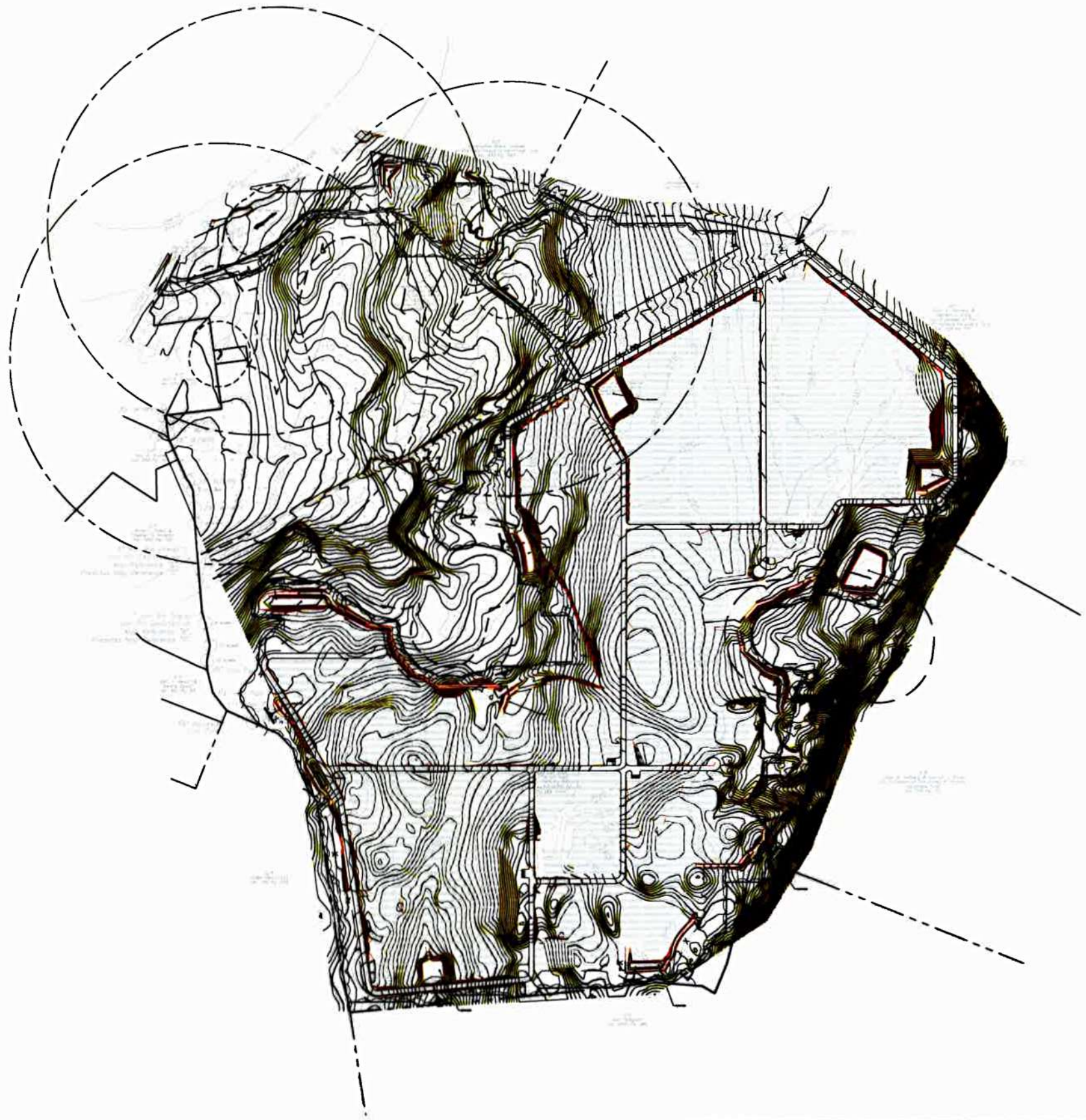
2	25.00%	33.33%	
3	33.33%	99999900.00%	



REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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SCALE IN FEET

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PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=200'
Project No. 170.2015
Date 07/30/2018
CAD File 2017-0.2015-SLOPE ANALYSIS

Title
SLOPE ANALYSIS EXHIBIT

Sheet No.
EXH-1

EXHIBIT L

SEDIMENT AND EROSION CONTROL NOTES

SEDIMENT & EROSION CONTROL NARRATIVE
THE SEDIMENT AND EROSION CONTROL PLAN WAS DEVELOPED TO PROTECT THE EXISTING ROADWAY AND STORM DRAINAGE SYSTEMS, ADJACENT PROPERTIES, AND ANY ADJACENT WETLAND AREA AND ANY ADJACENT WATER COURSE FROM SEDIMENT LADEN SURFACE RUNOFF AND EROSION. A CONSTRUCTION SEQUENCE IS PROVIDED TO PROVIDE SURFACE RUNOFF EROSION CONTROLS PRIOR TO THE BEGINNING OF PROJECT DEMOLITION AND/OR CONSTRUCTION.

CONSTRUCTION SCHEDULE
THE ANTICIPATED STARTING DATE FOR CONSTRUCTION IS SPRING 2019 WITH COMPLETION ANTICIPATED SPRING 2020. APPROPRIATE SEDIMENT AND EROSION CONTROL MEASURES AS DESCRIBED HEREIN SHALL BE INSTALLED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF ALL DEMOLITION OR CONSTRUCTION ACTIVITY. SCHEDULE WORK TO MINIMIZE THE LENGTH OF TIME THAT BARE SOIL WILL BE EXPOSED.

CONTINGENCY EROSION PLAN
THE CONTRACTOR SHALL INSTALL ALL SPECIFIED SEDIMENT AND EROSION CONTROL MEASURES AND WILL BE REQUIRED TO MAINTAIN THEM IN THEIR INTENDED FUNCTIONING CONDITION. THE AGENTS OF THE CTDEEP, TOWN OF WATERFORD CONSERVATION COMMISSION AND CIVIL ENGINEER SHALL HAVE THE AUTHORITY TO REQUIRE SUPPLEMENTAL MAINTENANCE OR ADDITIONAL MEASURES IF FIELD CONDITIONS ARE ENCOUNTERED BEYOND WHAT WOULD NORMALLY BE ANTICIPATED.

CONSTRUCTION SEQUENCE
THE FOLLOWING CONSTRUCTION SEQUENCE IS RECOMMENDED:
1. CONTACT TOWN OF WATERFORD CONSERVATION COMMISSION AGENT AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO COMMENCEMENT OF ANY DEMOLITION, CONSTRUCTION OR REGULATED ACTIVITY ON THIS PROJECT.

2. CLEARING LIMITS SHALL BE PHYSICALLY MARKED IN THE FIELD AND APPROVED BY THE TOWN OF WATERFORD CONSERVATION COMMISSION AGENT PRIOR TO THE START OF WORK ON THE SITE. INSTALL TREE PROTECTION AND PERIMETER SILT FENCE PER PLAN.

3. CONSTRUCT STONE CONSTRUCTION ENTRANCE ANTI-TRACKING PADS AT CONSTRUCTION ENTRANCE/EXIT AND INSTALL FILTER FABRIC AROUND GRATES OF CATCH BASINS OR INSTALL SILT SACKS ON CATCH BASIN INLETS ON OFF SITE ROADS. INSTALL SILT FENCE AND OTHER EROSION CONTROL DEVICES INDICATED ON THESE PLANS AT PERIMETER OF PROPOSED SITE DISTURBANCE AND INSTALL ALL EROSION CONTROL MEASURES AND TREE PROTECTION INDICATED ON THESE PLANS. INSTALL SEDIMENT BASINS AND SEDIMENT TRAPS, AND DIVERSION DITCHES, IF REQUIRED AT LOW AREAS OF SITE OR AS ORDERED BY THE ENGINEER OR AS SHOWN ON THESE PLANS. INSTALL SILT FENCE AND EROSION CONTROL BLANKETS AT SILT BASINS AND TRAPS AS REQUIRED. CONTRACTOR SHALL FOLLOW PHASING SCHEDULE.

4. CLEAR AND GRUB SITE, STOCKPILE CHIPS, STOCKPILE TOPSOIL. INSTALL SEDIMENT AND EROSION CONTROLS AT STOCKPILES.

5. INSTALL SILT FENCE, CONSTRUCT ADDITIONAL DIVERSION SWALES AND STONE CHECK DAMS LEADING TO SEDIMENT BASINS. PLACE EROSION CONTROLS AT SEDIMENT BASIN/SEDIMENT TRAP OUTLETS.

6. COMMENCE EARTHWORK. INSTALL ADDITIONAL SEDIMENT AND EROSION CONTROLS AS WORK PROGRESSES, TOPSOIL AND SEED SLOPES WHICH HAVE ACHIEVED FINAL SITE GRADING.

7. CONSTRUCTION STAKING OF ALL UTILITIES, ACCESS DRIVES, AND PARKING AREAS.

8. ROUGH GRADING AND FILLING OF SUBGRADES AND SLOPES.

9. WITHIN 24 HOURS OF DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.

10. BEFORE DISPOSING OF SOIL OR RECEIVING BORROW FOR THE SITE, THE CONTRACTOR MUST PROVIDE EVIDENCE THAT EACH SPOIL OR BORROW AREA HAS A SEDIMENT AND EROSION CONTROL PLAN APPROVED BY THE TOWN OF WATERFORD CONSERVATION COMMISSION AND WHICH IS BEING IMPLEMENTED AND MAINTAINED. THE CONTRACTOR SHALL ALSO NOTIFY THE TOWN OF WATERFORD CONSERVATION COMMISSION IN WRITING OF ALL RECEIVING SPOIL AND BORROW AREAS WHEN THEY HAVE BEEN IDENTIFIED.

11. CONTINUE INSTALLATION OF STORM DRAINAGE AS SUBGRADE ELEVATIONS ARE ACHIEVED.

12. THROUGHOUT CONSTRUCTION SEQUENCE, REMOVE SEDIMENT FROM BEHIND SILT FENCES, HAY BALES AND OTHER EROSION CONTROL DEVICES, AND FROM SEDIMENT BASINS AND SEDIMENT TRAPS AS REQUIRED. REMOVAL SHALL BE ON A PERIODIC BASIS (EVERY SIGNIFICANT RAINFALL OF 0.25 INCH OR GREATER). INSPECTION OF SEDIMENT AND EROSION CONTROL MEASURES SHALL BE ON A WEEKLY BASIS AND AFTER EACH RAINFALL OF 0.25 INCHES OR GREATER. SEDIMENT COLLECTED SHALL BE DEPOSITED AND SPREAD EVENLY UPLAND ON SLOPES DURING CONSTRUCTION.

13. INSTALL UTILITIES.

14. COMPLETE GRADING TO SUBGRADES.

15. CONSTRUCT GRAVEL ACCESS DRIVES.

16. CONDUCT FINE GRADING.

17. FINAL FINE GRADING OF SLOPE AND NON-PAVED AREAS.

18. PLACE 4" TOPSOIL ON SLOPES AFTER FINAL GRADING IS COMPLETED. FERTILIZE SEED AND MULCH. SEED MIXTURE TO BE INSTALLED AUGUST 15 – OCTOBER 1. USE EROSION CONTROL BLANKETS AS REQUIRED OR ORDERED FOR SLOPES GREATER THAN 3:1 AND AS SHOWN ON LANDSCAPE PLANS OR EROSION CONTROL PLANS. FOR TEMPORARY STABILIZATION BEYOND SEEDING DATES USE ANNUAL RYE AT 4.0 LBS/1,000 S.F. FERTILIZE WITH 10-10-10 AT 1.0 LBS. OF NITROGEN PER 1,000 S.F. AND LIME AT 100 LBS/1,000 S.F. (MAX.).

19. INSTALL SOLAR ARRAY POSTS AND RACKING SYSTEM, AND SOLAR PANELS.

20. CLEAN STORM DRAINAGE PIPE STRUCTURES, SEDIMENT BASINS OF DEBRIS AND SEDIMENT.

21. UPON DIRECTION OF THE TOWN OF WATERFORD CONSERVATION COMMISSION AGENT, SEDIMENT AND EROSION CONTROL MEASURES SHALL BE REMOVED FOLLOWING STABILIZATION OF THE SITE.

OPERATION REQUIREMENTS

CLEARING AND GRUBBING OPERATIONS
1. ALL SEDIMENT AND EROSION CONTROL MEASURES, INCLUDING THE CONSTRUCTION OF TEMPORARY SEDIMENTATION BASINS AND STONE CONSTRUCTION ENTRANCE ANTI-TRACKING PADS, WILL BE INSTALLED PRIOR TO THE START OF CLEARING AND GRUBBING AND DEMOLITION OPERATIONS.

2. FOLLOWING INSTALLATION OF ALL SEDIMENT AND EROSION CONTROL MEASURES, THE CONTRACTOR SHALL NOT PROCEED WITH GRADING, FILLING OR OTHER CONSTRUCTION OPERATIONS UNTIL THE ENGINEER HAS INSPECTED AND APPROVED ALL INSTALLATIONS.

3. THE CONTRACTOR SHALL TAKE EXTREME CARE DURING CLEARING AND GRUBBING OPERATIONS SO AS NOT TO DISTURB UNPROTECTED WETLAND AREAS OR SEDIMENT AND EROSION CONTROL DEVICES.

4. FOLLOWING THE COMPLETION OF CLEARING AND GRUBBING OPERATIONS, ALL AREAS SHALL BE STABILIZED WITH TOPSOIL AND SEEDING OR CRUSHED STONE AS SOON AS PRACTICAL.

ROUGH GRADING OPERATIONS

1. DURING THE REMOVAL AND/OR PLACEMENT OF EARTH AS INDICATED ON THE GRADING PLAN, TOPSOIL SHALL BE STRIPPED AND APPROPRIATELY STOCKPILED FOR REUSE.

2. ALL STOCKPILED TOPSOIL SHALL BE SEEDED, MULCHED WITH HAY, AND ENCLOSED BY A SILTATION FENCE.

FILLING OPERATIONS

1. PRIOR TO FILLING, ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE PROPERLY IMPLEMENTED, MAINTAINED AND FULLY INSTALLED, AS DIRECTED BY THE ENGINEER AND AS SHOWN ON THIS PLAN.

2. ALL FILL MATERIAL ADJACENT TO ANY WETLAND AREAS, IF APPLICABLE TO THIS PROJECT, SHALL BE GOOD QUALITY, WITH LESS THAN 5% FINES PASSING THROUGH A #200 SIEVE (BANK RUN), SHALL BE PLACED IN LIFT THICKNESSES NOT GREATER THAN THAT SPECIFIED IN PROJECT SPECIFICATIONS AND/OR THE PROJECT GEOTECHNICAL REPORT. LIFTS SHALL BE COMPACTED TO 95% MAX. DRY DENSITY MODIFIED PROCTOR OR AS SPECIFIED IN THE CONTRACT SPECIFICATIONS OR IN THE GEOTECHNICAL REPORT.

3. AS GENERAL GRADING OPERATIONS PROGRESS, ANY TEMPORARY DIVERSION DITCHES SHALL BE RAISED OR LOWERED, AS NECESSARY, TO DIVERT SURFACE RUNOFF TO THE SEDIMENT BASINS OR SEDIMENT TRAPS.

PLACEMENT OF DRAINAGE STRUCTURES, UTILITIES, AND BUILDING CONSTRUCTION OPERATIONS.

1. SILT FENCES SHALL BE INSTALLED AT THE DOWNHILL SIDES OF EMBANKMENTS, MUD PUMP DISCHARGES, AND UTILITY TRENCH MATERIAL STOCKPILES. HAY BALES/STRAW BALES MAY BE USED IF SHOWN ON THE SEDIMENT AND EROSION CONTROL PLANS OR IF DIRECTED BY THE CIVIL ENGINEER.

FINAL GRADING AND PAVING OPERATIONS

1. ALL INLET AND OUTLET PROTECTION SHALL BE PLACED AND MAINTAINED AS SHOWN ON SEDIMENT AND EROSION CONTROL PLANS AND DETAILS, AND AS DESCRIBED IN SPECIFICATIONS AND AS DESCRIBED HEREIN.

2. NO CUT OR FILL SLOPES SHALL EXCEED 2:1 EXCEPT WHERE STABILIZED BY ROCK FACED EMBANKMENTS OR EROSION CONTROL BLANKETS, OR JUTE MESH AND VEGETATION. ALL SLOPES SHALL BE SEEDED, AND ANY ROAD OR DRIVEWAY SHOULDER AND BANKS SHALL BE STABILIZED IMMEDIATELY UPON COMPLETION OF FINAL GRADING UNTIL TURF IS ESTABLISHED.

3. ACCESS DRIVE SUB-BASE AND BASE COURSES SHALL BE INSTALLED AS SOON AS FINAL SUB-GRADES ARE ESTABLISHED AND UNDERGROUND UTILITIES AND STORM DRAINAGE SYSTEMS HAVE BEEN INSTALLED.

4. AFTER CONSTRUCTION OF ACCESS ROADS, TOPSOIL, FINAL SEED, MULCH AND LANDSCAPING, REMOVE ALL TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES ONLY AFTER ALL GRASS AREAS HAVE BEEN WELL ESTABLISHED AND THE SITE IS STABLE AND HAS BEEN INSPECTED AND APPROVED BY THE TOWN OF WATERFORD CONSERVATION COMMISSION AGENT OR CTDEEP.

INSTALLATION OF SEDIMENTATION AND EROSION CONTROL MEASURES

I. SILTATION FENCE
A. DIG A SIX INCH TRENCH ON THE UPHILL SIDE OF THE DESIGNATED FENCE LINE LOCATION.

B. POSITION THE POST AT THE BACK OF THE TRENCH (DOWNHILL SIDE), AND HAMMER THE POST AT LEAST 1.5 FEET INTO THE GROUND.

C. LAY THE BOTTOM SIX INCHES OF THE FABRIC INTO THE TRENCH TO PREVENT UNDERMINING BY STORM WATER RUN-OFF.

D. BACKFILL THE TRENCH AND COMPACT.

II. HAY BALES/STRAW BALES
A. BALES SHALL BE PLACED IN A SINGLE ROW, LENGTHWISE, ORIENTED PARALLEL TO THE CONTOUR, WITH ENDS OF ADJACENT BALES TIGHTLY ABUTTING ONE ANOTHER.

B. BALES SHALL BE ENTRENCHED AND BACKFILLED. A TRENCH SHALL BE EXCAVATED THE WIDTH OF A BALE AND THE LENGTH OF THE PROPOSED BARRIER TO A MINIMUM DEPTH OF FOUR INCHES. AFTER THE BALES ARE STAKED, THE EXCAVATED SOIL SHALL BE BACKFILLED AGAINST THE BARRIER.

C. EACH BALE SHALL BE SECURELY ANCHORED BY AT LEAST TWO (2) STAKES.

D. THE GAPS BETWEEN BALES SHALL BE WEDGED WITH STRAW TO PREVENT WATER LEAKAGE.

E. THE BARRIER SHALL BE EXTENDED TO SUCH A LENGTH THAT THE BOTTOMS OF THE END BALES ARE HIGHER IN ELEVATION THAN THE TOP OF THE LOWEST MIDDLE BALE, TO ENSURE THAT RUN-OFF WILL FLOW EITHER THROUGH OR OVER THE BARRIER, BUT NOT AROUND IT.

OPERATION AND MAINTENANCE OF SEDIMENT AND EROSION CONTROL MEASURES
I. SILTATION FENCE
A. ALL SILTATION FENCES SHALL BE INSPECTED AS A MINIMUM WEEKLY OR AFTER EACH RAINFALL. ALL DETERIORATED FABRIC AND DAMAGED POSTS SHALL BE REPLACED AND PROPERLY REPOSITIONED IN ACCORDANCE WITH THIS PLAN.

B. SEDIMENT DEPOSITS SHALL BE REMOVED FROM BEHIND THE FENCE WHEN THEY EXCEED A HEIGHT OF ONE FOOT.

II. HAY BALES/STRAW BALES
A. ALL HAY BALE/STRAW BALE RINGS SHALL BE INSPECTED FOLLOWING EACH RAINFALL. REPAIR OR REPLACEMENT SHALL BE PROMPTLY MADE AS NEEDED.

B. DEPOSITS SHALL BE REMOVED AND CLEANED-OUT IF ONE HALF OF THE ORIGINAL HEIGHT OF THE BALES BECOMES FILLED WITH SEDIMENT.

III. SEDIMENT BASINS/SEDIMENT TRAPS
A. CONTRACTOR TO KEEP WEEKLY CHECKLIST LOGS FOR INSPECTIONS OF ALL SEDIMENT AND EROSION CONTROL DEVICES AND HAVE THEM READILY AVAILABLE ON-SITE AT ALL TIMES FOR INSPECTION BY CT DEEP, LOCAL AUTHORITIES OR ENGINEER.

B. ALL SEDIMENT BASINS AND/OR SEDIMENT TRAPS SHALL BE INSPECTED FOLLOWING EACH RAINFALL. REPAIR OF SLOPES SHALL BE PROMPTLY MADE AS NEEDED.

C. SEDIMENT DEPOSITS SHALL BE REMOVED FROM SEDIMENT BASINS AND/OR SEDIMENT TRAPS WHEN THEY EXCEED A HEIGHT OF ONE FOOT UNLESS OTHERWISE INDICATED ON THE EROSION CONTROL PLANS AND DETAILS TO BE AT A SPECIFIC ELEVATION PER CLEAN OUT MARKERS.

D. SEDIMENT SHALL BE DISPOSED OF ON-SITE OR AS DIRECTED BY THE ENGINEER AND LOCAL GOVERNING OFFICIALS. SEE SEDIMENT AND EROSION CONTROL NOTES HEREIN REGARDING DISPOSAL REQUIREMENTS FOR OFF SITE SPOIL DISPOSAL.

SEDIMENT AND EROSION CONTROL PLAN
1. HAY BALE/STRAW BALE FILTERS WILL BE INSTALLED AT ALL CULVERT OUTLETS IF CULVERT OUTLETS ARE APPLICABLE TO THIS PROJECT AND SILTATION FENCE INSTALLED ALONG THE TOE OF ALL CRITICAL CUT AND FILL SLOPES.

2. CULVERT DISCHARGE AREAS WILL BE PROTECTED WITH RIP RAP CHANNELS. ENERGY DISSIPATORS WILL BE INSTALLED AS SHOWN ON THESE PLANS AND AS NECESSARY.

3. CATCH BASINS WILL BE PROTECTED WITH HAY BALE/STRAW BALE FILTERS, SILT SACKS, SILTATION FENCE, OR OTHER INLET PROTECTION DEVICES PER DETAILS, THROUGHOUT THE CONSTRUCTION PERIOD AND UNTIL ALL DISTURBED AREAS ARE THOROUGHLY STABILIZED.

4. ALL SEDIMENT AND EROSION CONTROL MEASURES WILL BE INSTALLED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, LATEST EDITION.

5. SEDIMENT AND EROSION CONTROL MEASURES WILL BE INSTALLED PRIOR TO DEMOLITION AND/OR CONSTRUCTION WHENEVER POSSIBLE.

6. ALL CONTROL MEASURES WILL BE MAINTAINED IN EFFECTIVE CONDITION THROUGHOUT THE DEMOLITION AND CONSTRUCTION PERIOD UNTIL THE SITE IS DETERMINED TO BE STABILIZED BY THE AUTHORITY HAVING JURISDICTION.

7. ADDITIONAL CONTROL MEASURES WILL BE INSTALLED DURING THE CONSTRUCTION PERIOD, IF NECESSARY OR REQUIRED OR AS DIRECTED BY THE CIVIL ENGINEER OR BY THE AUTHORITY HAVING JURISDICTION.

8. SEDIMENT REMOVED FROM EROSION CONTROL STRUCTURES WILL BE DISPOSED IN A MANNER WHICH IS CONSISTENT WITH THE INTENT AND REQUIREMENTS OF THE SEDIMENT AND EROSION CONTROL PLANS, NOTES, AND DETAILS.

9. THE DEVELOPER IS ASSIGNED THE RESPONSIBILITY FOR IMPLEMENTING THIS SEDIMENT AND EROSION CONTROL PLAN. THIS RESPONSIBILITY INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED ON THE CONSTRUCTION SITE OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN, NOTIFICATION OF THE MUNICIPALITY AND/OR TOWN OF WATERFORD CONSERVATION COMMISSION OFFICE OR AUTHORITY HAVING JURISDICTION OF ANY TRANSFER OF THIS RESPONSIBILITY AND FOR CONVEYING A COPY OF THE SEDIMENT AND EROSION CONTROL PLAN IF THE TITLE TO THE LAND IS TRANSFERRED.

SEDIMENT AND EROSION CONTROL NOTES
1. THE SEDIMENT AND EROSION CONTROL PLAN IS ONLY INTENDED TO DESCRIBE THE SEDIMENT AND EROSION CONTROL TREATMENT FOR THIS SITE. SEE SEDIMENT AND EROSION CONTROL DETAILS AND CONSTRUCTION SEQUENCE. REFER TO SITE PLAN FOR GENERAL INFORMATION AND OTHER CONTRACT PLANS FOR APPROPRIATE INFORMATION.

2. THE DEVELOPER IS RESPONSIBLE FOR IMPLEMENTING THIS SEDIMENT AND EROSION CONTROL PLAN. THIS RESPONSIBILITY INCLUDES THE PROPER INSTALLATION AND MAINTENANCE OF SEDIMENT AND EROSION CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED WITH CONSTRUCTION ON THE SITE OF THE REQUIREMENTS AND OBJECTIVES OF THIS PLAN, INFORMING THE AUTHORITY HAVING JURISDICTION OF ANY TRANSFER OF THIS RESPONSIBILITY, AND FOR CONVEYING A COPY OF THE SEDIMENT & EROSION CONTROL PLAN IF THE TITLE TO THE LAND IS TRANSFERRED.

3. AN EROSION CONTROL BOND MAY BE REQUIRED TO BE POSTED WITH TOWN OF WATERFORD TO ENSURE IMPLEMENTATION OF THE SEDIMENT AND EROSION CONTROL MEASURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE POSTING OF THIS BOND AND FOR INQUIRIES TO THE TOWN OF WATERFORD FOR INFORMATION ON THE METHOD, TYPE AND AMOUNT OF THE BOND POSTING UNLESS OTHERWISE DIRECTED BY THE OWNER.

4. VISUAL SITE INSPECTIONS SHALL BE IN ACCORDANCE WITH CTDEEP GENERAL PERMIT REQUIREMENTS AND BE CONDUCTED WEEKLY, AND AFTER EACH MEASURABLE PRECIPITATION EVENT OF 0.25 INCHES OR GREATER BY QUALIFIED PERSONNEL, TRAINED AND EXPERIENCED IN SEDIMENT AND EROSION CONTROL, TO ASCERTAIN THAT THE SEDIMENT AND EROSION CONTROL (E&S) BMPS ARE OPERATIONAL AND EFFECTIVE IN PREVENTING POLLUTION. A WRITTEN REPORT OF EACH INSPECTION SHALL BE KEPT, AND INCLUDE:
A) A SUMMARY OF THE SITE CONDITIONS, E&S BMPS, AND COMPLIANCE; AND
B) THE DATE, TIME, AND THE NAME OF THE PERSON CONDUCTING THE INSPECTION
C) TURBIDITY TESTING AS REQUIRED BY THE GENERAL PERMIT (NPDES)
D) REPORTING TO CTDEEP SHALL BE AS REQUIRE BY THE GENERAL PERMIT (NPDES)

5. THE CONTRACTOR SHALL CONSTRUCT ALL SEDIMENT AND EROSION CONTROLS IN ACCORDANCE WITH 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, LATEST EDITION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, AND AS DIRECTED BY THE CTDEEP OR TOWN OF WATERFORD CONSERVATION COMMISSION. THE CONTRACTOR SHALL KEEP A COPY OF THE GUIDELINES ON-SITE FOR REFERENCE DURING CONSTRUCTION.

6. ADDITIONAL AND/OR ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES MAY BE INSTALLED DURING THE CONSTRUCTION PERIOD IF FOUND NECESSARY BY THE CONTRACTOR, OWNER, SITE ENGINEER, TOWN OF WATERFORD CONSERVATION COMMISSION AGENT, OR GOVERNING AGENCIES. THE CONTRACTOR SHALL CONTACT THE OWNER AND APPROPRIATE GOVERNING AGENCIES FOR APPROVAL IF ALTERNATIVE CONTROLS OTHER THAN THOSE SHOWN ON THE PLANS ARE PROPOSED.

7. THE CONTRACTOR SHALL INSPECT ALL SEDIMENT AND EROSION CONTROLS BEFORE AND AFTER EACH STORM (0.25 INCHES OR GREATER RAINFALL), OR AT LEAST WEEKLY, TO VERIFY THAT THE CONTROLS ARE OPERATING PROPERLY AND MAKE REPAIRS WHERE NECESSARY.

8. THE CONTRACTOR SHALL KEEP A SUPPLY OF SEDIMENT AND EROSION CONTROL MATERIAL (HAY BALES, SILT FENCE, JUTE MESH, RIP RAP, EROSION CONTROL BLANKETS, ETC.) ON-SITE FOR MAINTENANCE AND EMERGENCY REPAIRS.

9. PROTECT EXISTING TREES THAT ARE TO BE SAVED BY FENCING AT THE DRIP LINE OR AS SHOWN WITH SNOW FENCE, ORANGE SAFETY FENCE, OR EQUIVALENT FENCING. ANY LIMB TRIMMING SHOULD BE DONE BEFORE CONSTRUCTION BEGINS IN THAT AREA; FENCING SHALL BE MAINTAINED AND REPAIRED DURING CONSTRUCTION.

10. INSTALL PERIMETER SEDIMENT AND EROSION CONTROLS PRIOR TO CLEARING OR CONSTRUCTION. ALL CONSTRUCTION SHALL BE CONTAINED WITHIN THE LIMIT OF DISTURBANCE, WHICH SHALL BE MARKED WITH SILT FENCE, SAFETY FENCE, HAY BALES, RIBBONS, OR OTHER MEANS PRIOR TO CLEARING. CONSTRUCTION ACTIVITY SHALL REMAIN ON THE UPHILL SIDE OF THE SILT FENCE UNLESS WORK IS SPECIFICALLY CALLED FOR ON THE DOWNHILL SIDE OF THE FENCE.

11. STONE CONSTRUCTION ENTRANCE ANTI-TRACKING PADS SHALL BE INSTALLED AT START OF CONSTRUCTION AND MAINTAINED THROUGHOUT THE DURATION OF CONSTRUCTION.

12. TOPSOIL SHALL BE STRIPPED AND STOCKPILED FOR USE IN FINAL LANDSCAPING. ALL EARTH STOCKPILES SHALL HAVE HAY BALES OR SILT FENCE AROUND THE LIMIT OF PILE. PILES SHALL BE TEMPORARILY SEEDED IF PILE IS TO REMAIN IN PLACE FOR MORE THAN ONE (1) MONTH.

13. SEDIMENT BASINS AND SEDIMENT TRAPS SHALL PROVIDE 134 CUBIC YARDS OF SEDIMENT STORAGE PER DISTURBED ACRE CONTRIBUTING TO THE BASIN. PROVIDE BASIN VOLUMES FOR ALL DISTURBANCE ON SITE.

14. COMPLY WITH REQUIREMENTS OF CGS SECTION 22A 430B, FOR STORMWATER DISCHARGE FROM CONSTRUCTION ACTIVITIES AND WITH CTDEEP GENERAL PERMIT (NPDES) RECORD KEEPING AND INSPECTION REQUIREMENTS.

15. STONE CONSTRUCTION ENTRANCE ANTI-TRACKING PADS SHALL BE INSTALLED PRIOR TO ANY ON SITE EXCAVATION AND SHALL BE MAINTAINED DURING ALL EXCAVATION AND CONSTRUCTION ACTIVITIES.

16. MINIMIZE LAND DISTURBANCES. SEED AND MULCH DISTURBED AREAS WITH TEMPORARY MIX AS SOON AS PRACTICABLE (ONE WEEK MAXIMUM UNSTABILIZED PERIOD) USING PERENNIAL RYEGRASS AT 40 LBS PER ACRE. MULCH ALL CUT AND FILL SLOPES AND SWALES WITH LOOSE HAY AT A RATE OF 2 TONS PER ACRE. IF NECESSARY, REPLACE LOOSE HAY ON SLOPES WITH EROSION CONTROL BLANKETS OR JUTE CLOTH. MODERATELY GRADED AREAS, ISLANDS, AND TEMPORARY CONSTRUCTION STAGING AREAS MAY BE HYDROSEEDED WITH TACKIFIER.

17. MAINTAIN EXISTING PAVED AREAS FOR CONSTRUCTION STAGING FOR AS LONG AS POSSIBLE.

18. SILT FENCE AND OTHER SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH CONTRACT DRAWINGS AND MANUFACTURER'S RECOMMENDATIONS PRIOR TO WORK IN ANY UPLAND AREAS.

19. EXCAVATED MATERIAL FROM TEMPORARY SILT TRAPS MUST BE STOCKPILED ON UPHILL SIDE OF SILT FENCE.

20. INSTALL SILT FENCE ACCORDING TO MANUFACTURER'S INSTRUCTION, PARTICULARLY, BURY LOWER EDGE OF FABRIC INTO GROUND. SILT FENCE SHALL BE TENCATE ENVIROFENCE, PROPEX GEOTEX OR EQUIVALENT APPROVED BY THE CIVIL ENGINEER. FILTER FABRIC USED SHALL BE MIRAFI 100X OR APPROVED EQUIVALENT. SEE SPECIFICATIONS FOR FURTHER INFORMATION.

21. WHERE INDICATED ON SEDIMENT AND EROSION CONTROL PLANS USE NEW HAY/STRAW BALES AND REPLACE THEM WHENEVER THEIR CONDITION DETERIORATES BEYOND REASONABLE USABILITY. STAKE BALES SECURELY INTO GROUND AND BUTT TIGHTLY TOGETHER TO PREVENT UNDERCUTTING AND BYPASSING.

22. INSTALL TEMPORARY DIVERSION DITCHES, PLUNGE POOLS, SEDIMENT BASINS, SEDIMENT TRAPS, CONCRETE WASTE PITS AND DEWATERING PITS AS SHOWN AND AS NECESSARY DURING VARIOUS PHASES OF CONSTRUCTION TO CONTROL RUNOFF UNTIL UPHILL AREAS ARE DETERMINED TO BE STABILIZED BY THE AUTHORITY HAVING JURISDICTION. LOCATION OF TEMPORARY SEDIMENT BASINS WILL REQUIRE REVIEW AND APPROVAL BY THE CIVIL ENGINEER AND AUTHORITY HAVING JURISDICTION.

23. DIRECT ALL DEWATERING PUMP DISCHARGE TO A SEDIMENT CONTROL DEVICE SUCH AS TEMPORARY PITS, SEDIMENT TRAP, SEDIMENT BASINS OR GRASS FILTERS WITHIN THE APPROVED LIMIT OF DISTURBANCE. DISCHARGE TO STORM DRAINAGE SYSTEM OR SURFACE WATERS FROM SEDIMENT CONTROLS SHALL BE CLEAR.

24. BLOCK THE OPEN UPSTREAM ENDS OF DETENTION BASIN/SEDIMENTATION BASIN OUTLET CONTROL ORIFICE UNTIL SITE IS STABILIZED. BLOCK END OF STORM SEWERS IN EXPOSED TRENCHES WITH BOARDS AND SANDBAGS AT THE END OF EACH WORKING DAY WHEN RAIN IS EXPECTED.

25. SWEEP AFFECTED PORTIONS OF OFF SITE ROADS ONE OR MORE TIMES A DAY (OR LESS FREQUENTLY IF TRACKING IS NOT A PROBLEM) DURING CONSTRUCTION. OTHER DUST CONTROL MEASURES TO BE USED AS NECESSARY INCLUDE WATERING DOWN DISTURBED AREAS, USING CALCIUM CHLORIDE, AND COVERING LOADS ON DUMP TRUCKS.

26. PERIODICALLY CHECK ACCUMULATED SEDIMENT LEVELS IN THE SEDIMENT BASINS AND SEDIMENT TRAPS DURING CONSTRUCTION AND CLEAN ACCUMULATED SILT WHEN NECESSARY OR WHEN ONE FOOT OF SEDIMENT HAS ACCUMULATED OR PER SPECIFIC CLEANOUT MARKER ELEVATION. CLEAN ACCUMULATED SEDIMENT FROM CATCH BASIN SUMPS AS NECESSARY AND AS DIRECTED BY THE CIVIL ENGINEER OR OWNER'S CONSTRUCTION REPRESENTATIVE. REMOVE ACCUMULATED SEDIMENT FROM BEHIND HAY/STRAW BALES AND SILT FENCE WHEN LEVEL REACHES HALF THE HEIGHT OF THE BALE OR ONE FOOT AT SILT FENCE. DISPOSE OF SEDIMENT LEGALLY EITHER ON OR OFF SITE.

27. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.

28. ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE THROUGH A SEDIMENT CONTROL BMP, SUCH AS A PUMPED WATER FILTER BAG OR EQUIVALENT SEDIMENT REMOVAL FACILITY, OVER UNDISTURBED VEGETATED AREAS.

29. ALL EXCAVATED MATERIAL SHALL BE PLACED ON THE HIGH SIDE OF UTILITY AND STORM PIPE TRENCHES SO AS TO ALLOW THE TRENCH TO INTERCEPT ALL SILT LADEN RUNOFF.

30. CONTRACTOR SHALL ONLY EXCAVATE AS MUCH UTILITY AND STORM PIPE TRENCH WORK AS CAN BE COMPLETED, BACKFILLED AND STABILIZED IN ONE DAY SO AS TO LIMIT THE AMOUNT OF OPEN, DISTURBED TRENCHING.

31. ANY STOCKPILES OF STRIPPED MATERIALS ARE TO BE PERIODICALLY SPRAYED WITH WATER OR A CRUSTING AGENT TO STABILIZE POTENTIALLY WIND-BLOWN MATERIAL. HAUL ROADS BOTH INTO AND AROUND THE SITE ARE TO BE SPRAYED AS NEEDED TO SUPPRESS DUST. TRUCKS HAULING IMPORT FILL MATERIAL ARE TO BE TARPED TO AID IN THE CONTROL OF AIRBORNE DUST. DURING HIGH WIND EVENTS (20 TO 30 MPH SUSTAINED) CONSTRUCTION ACTIVITY SHALL BE LIMITED OR CEASED IF DUST CANNOT BE CONTROLLED BY WETTING.

32. AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT HAS A MINIMUM OF 70% UNIFORM PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING OR OTHER MOVEMENTS UNLESS OTHERWISE DETERMINED BY THE AUTHORITY HAVING JURISDICTION.

33. MAINTAIN ALL PERMANENT AND TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES IN EFFECTIVE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD. UPON COMPLETION OF WORK SWEEP ROADWAYS AND REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROLS WHEN AUTHORIZED BY AUTHORITY HAVING JURISDICTION. FILE NOT (NOTICE OF TERMINATION) WITH AUTHORITY HAVING JURISDICTION RESPONSIBLE FOR REGULATING STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES PER NPDES.

34. WHERE POSSIBLE, CONSTRUCTION WITHIN THE 100 FEET OF VERNAL SHALL BE AVOIDED FROM MARCH – JULY. THE MOST CRITICAL PERIODS OF WETLAND ANIMALS MIGRATING INTO THE POOLS TO BREAD IS MARCH – APRIL.

35. WHERE APPROPRIATE, STRAW WATTLES SHALL BE USED AS AN ALTERNATIVE TO GEOTEXTILE SILT FENCING. WHEN INSTALLING WATTLES, SOIL DISTURBANCE SHALL BE MINIMIZED.

36. WHERE GEOTEXTILE SILT FENCING IS REQUIRED, SUCH FENCING SHALL BE INSTALLED IN A SYNCOPATED ALIGNMENT TO MINIMIZE THE IMPACTS TO MIGRATING/DISPERSING AMPHIBIANS.

37. THE CONTRACTOR SHALL AVOID THE USE OF EROSION CONTROL BARRIERS AND SLOPE STABILIZATION FABRICS THAT CONTAIN NETTING, PARTICULARLY PLASTIC NETTING. ALL NETTING SHALL BE BIODEGRADABLE WITHIN WETLAND BUFFER ZONES AS DEPICTED ON THE SITE PLAN.

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

REVISIONS

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Designed	H.J.L.
Drawn	H.J.L.
Reviewed	
Scale	NONE
Project No.	1703515
Date	07/30/2018
CAD File	EC170351501

Title
SEDIMENT AND EROSION CONTROL NOTES

Sheet No.
EC-17

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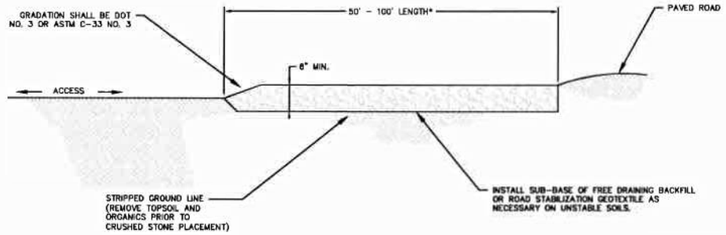
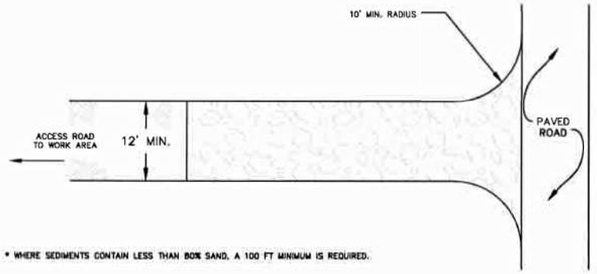
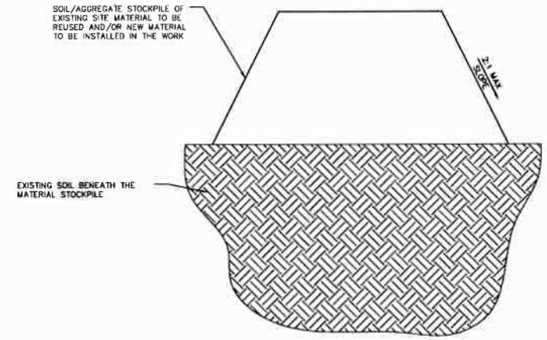


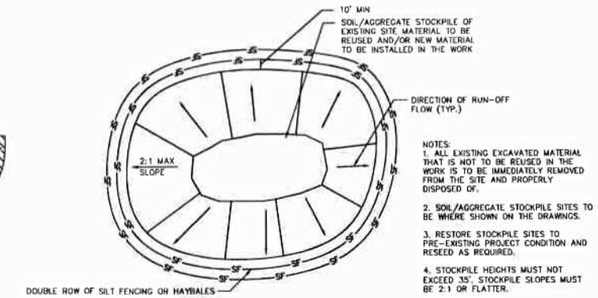


* WHERE SEDIMENTS CONTAIN LESS THAN 80% SAND, A 100 FT MINIMUM IS REQUIRED.

TYPICAL CONSTRUCTION ENTRANCE

N.T.S. CT DEEP CE-2

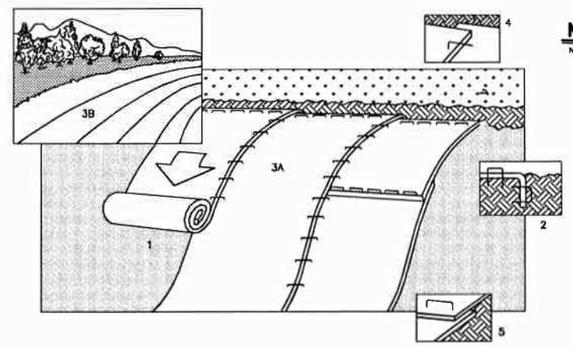




NOTES:
1. ALL EXISTING EXCAVATED MATERIAL THAT IS NOT TO BE REUSED IN THE WORK IS TO BE IMMEDIATELY REMOVED FROM THE SITE AND PROPERLY DISPOSED OF.
2. SOIL/AGGREGATE STOCKPILE SITES TO BE WHERE SHOWN ON THE DRAWINGS.
3. RESTORE STOCKPILE SITES TO PRE-EXISTING PROJECT CONDITION AND RESEED AS REQUIRED.
4. STOCKPILE HEIGHTS MUST NOT EXCEED 35'. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.

MATERIALS STOCKPILE DETAIL

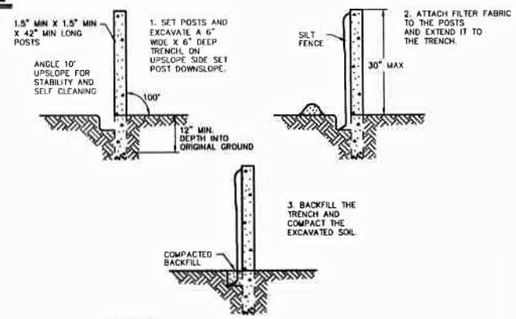
N.T.S. BLEC-006

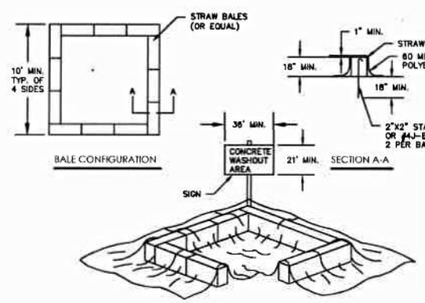


1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF LIME, FERTILIZER,AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2" OVERLAP.
5. WHEN BLANKETS MUST BE SPLICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 4" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.

SLOPE STABILIZATION DETAIL

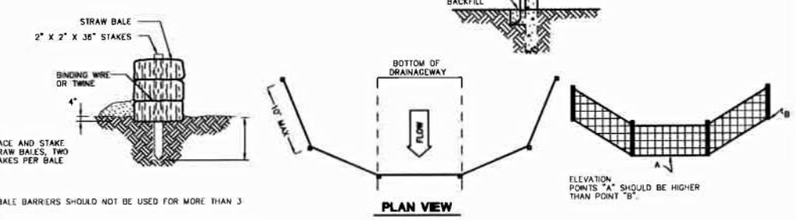
N.T.S. BLEC-010





CONCRETE WASH PIT

N.T.S



STRAW BALE BARRIERS SHOULD NOT BE USED FOR MORE THAN 3 MONTHS

SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/3 THE ABOVE GROUND HEIGHT OF THE BARRIER.

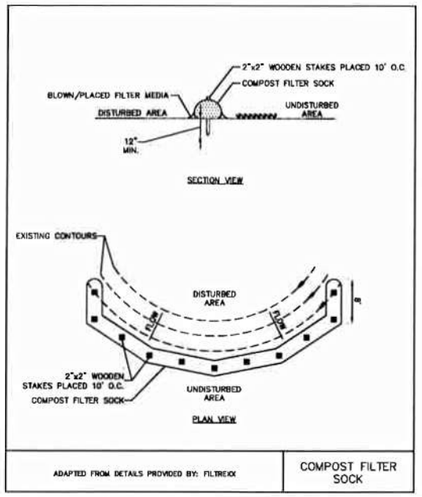
ANY SECTION OF STRAW BALE BARRIER WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET.

STRAW BALE DETAIL

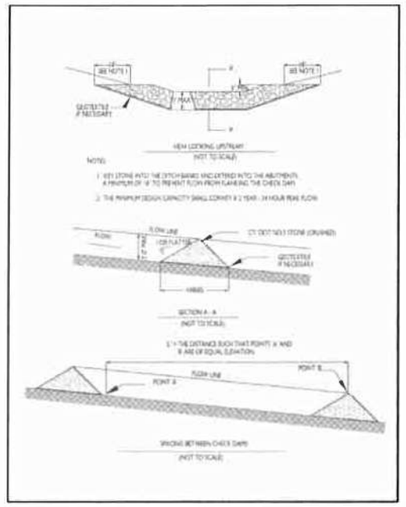
N.T.S

SILT FENCE BARRIER

N.T.S. CTEC-003

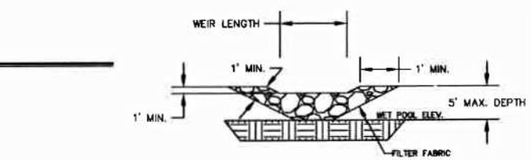


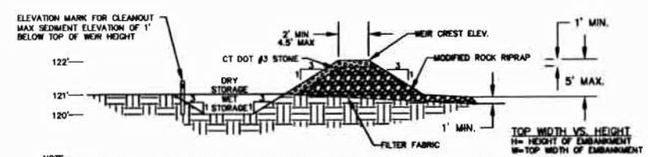
ADAPTED FROM DETAILS PROVIDED BY: FILTREXX	COMPOST FILTER SOCK



STONE (ROCK) CHECK DAM DETAIL

N.T.S





NOTE:
1. ALL DETAIL INFORMATION SHOULD BE USED AS A GUIDELINE. ALL TEMPORARY SEDIMENT TRAPS MUST CONFORM TO THE CT DEEP 2002 GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL MANUAL.
2. THE VOLUME OF THE WET STORAGE SHALL BE AT LEAST TWICE THE VOLUME OF THE SEDIMENT STORAGE VOLUME AND SHALL BE DESIGNED TO A MINIMUM DEPTH OF 2 FEET, PER CT DEEP 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL MANUAL.

TOP WIDTH VS. HEIGHT
H= HEIGHT OF EMBANKMENT
W= TOP WIDTH OF EMBANKMENT

H(ft)	W.(ft)
1.5	2.0
2.0	2.0
2.5	2.5
3.0	2.5
3.5	3.0
4.0	3.0
4.5	4.0
5.0	4.5

TEMPORARY SEDIMENT TRAP

N.T.S. BLEC-002

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

Date:
RECORDING
No. Date

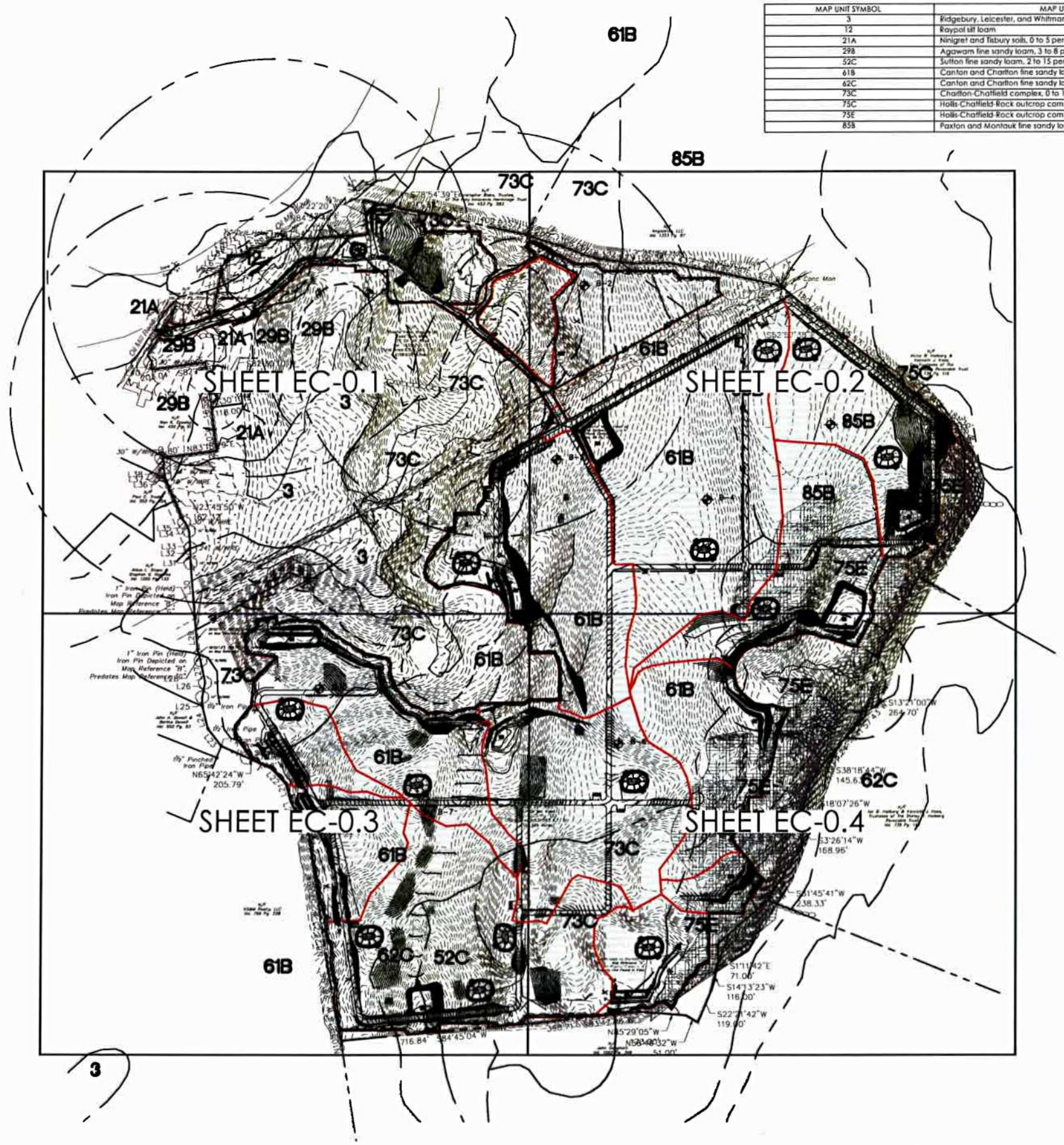
Designed	H.J.L.
Drawn	H.J.L.
Reviewed	M.P.S.
Scale	NONE
Project No.	17035.15
Date	07/30/2018
CAD File	EC170351501

Title
SEDIMENT AND EROSION CONTROL DETAILS

Sheet No.
EC-18

EXHIBIT M

MAP UNIT SYMBOL	MAP UNIT SYMBOL
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony
12	Raypol silt loam
21A	Ninigret and Tisbury soils, 0 to 5 percent slopes
29B	Agawam fine sandy loam, 3 to 8 percent slopes
52C	Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony
61B	Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony
62C	Canton and Charlton fine sandy loam, 3 to 15 percent slopes, extremely stony
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky
75C	Hollis-Chatfield-Rock outcrop complex, 3 to 15 percent slopes
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony



REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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GRAPHIC SCALE
200 100 0 200
SCALE IN FEET

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117 OIL MILL ROAD
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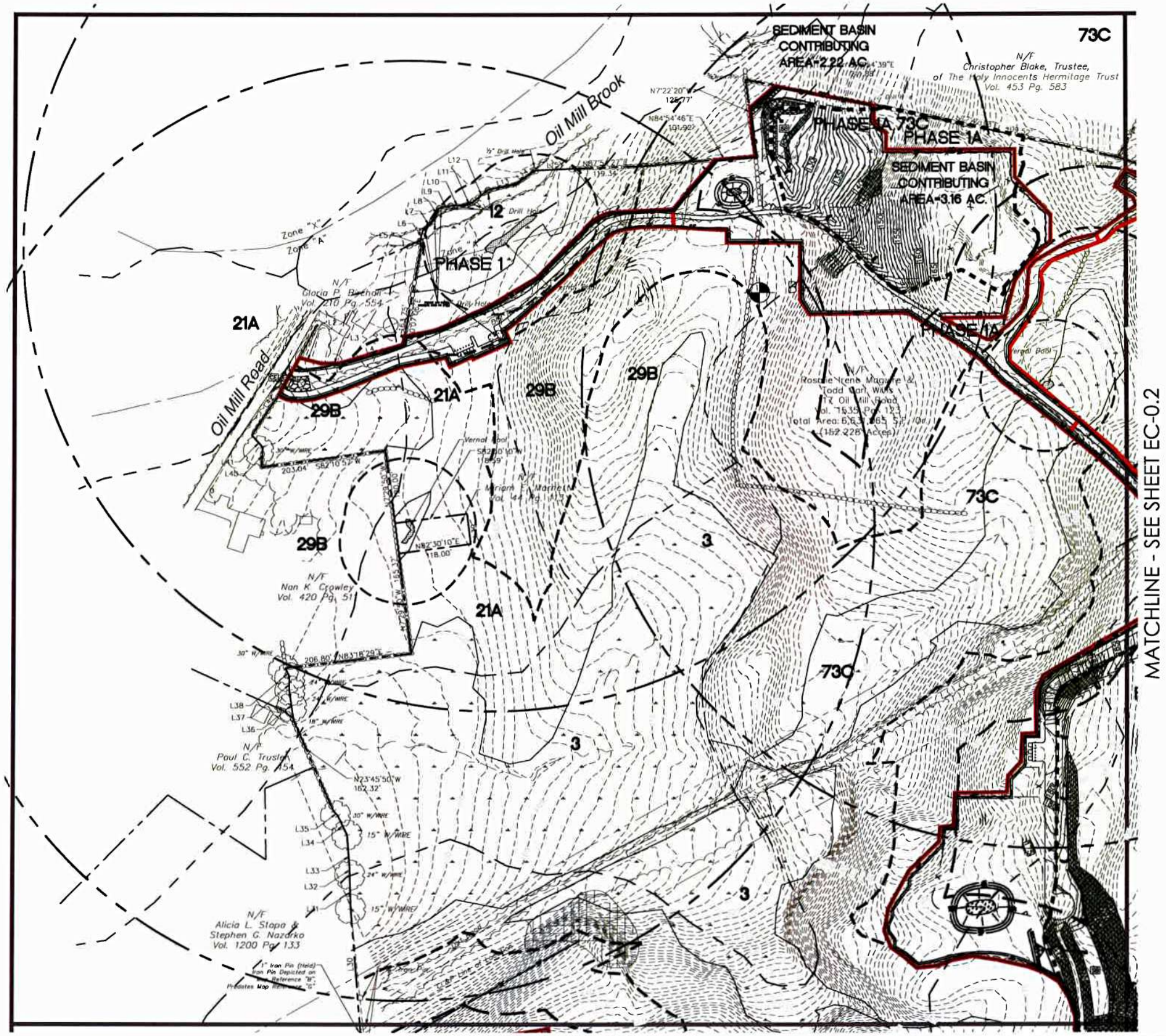
Reviewed
Scale 1"=200'
Project No. 1703815
Date 07/30/2018
CAD File ESRI TRUE COLOR - QUADRANT

Title
OVERALL E&S CONTROL PLAN - QUADRANT EXHIBIT

Sheet No.
EC-0.0



MATCHLINE - SEE SHEET EC-0.2

MATCHLINE - SEE SHEET EC-0.3

EROSION CONTROL LEGEND:

CONTROL MEASURE	ILLUSTRATION
HAY BALES AT CATCH BASINS	
STONE CHECK DAM	
SILT FENCE	
CONSTRUCTION ENTRANCE	
LIMIT OF DISTURBANCE LINE AND CONTRACT LIMIT LINE	
EROSION CONTROL BLANKET	
STOCKPILE AREA WITH DOUBLE ROW OF SILT FENCE	
DIVERSION SWALE	
TEMPORARY SILT TRAP	
SEDIMENT BASIN	
USGS SOIL DELINEATION BOUNDARY	
DRAINAGE BOUNDARY	
FILTER SOCK	
PHASE BOUNDARY	
CONCRETE WASH PIT	

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

FOR PERMITTING PURPOSES ONLY NOT RELEASED FOR CONSTRUCTION

GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

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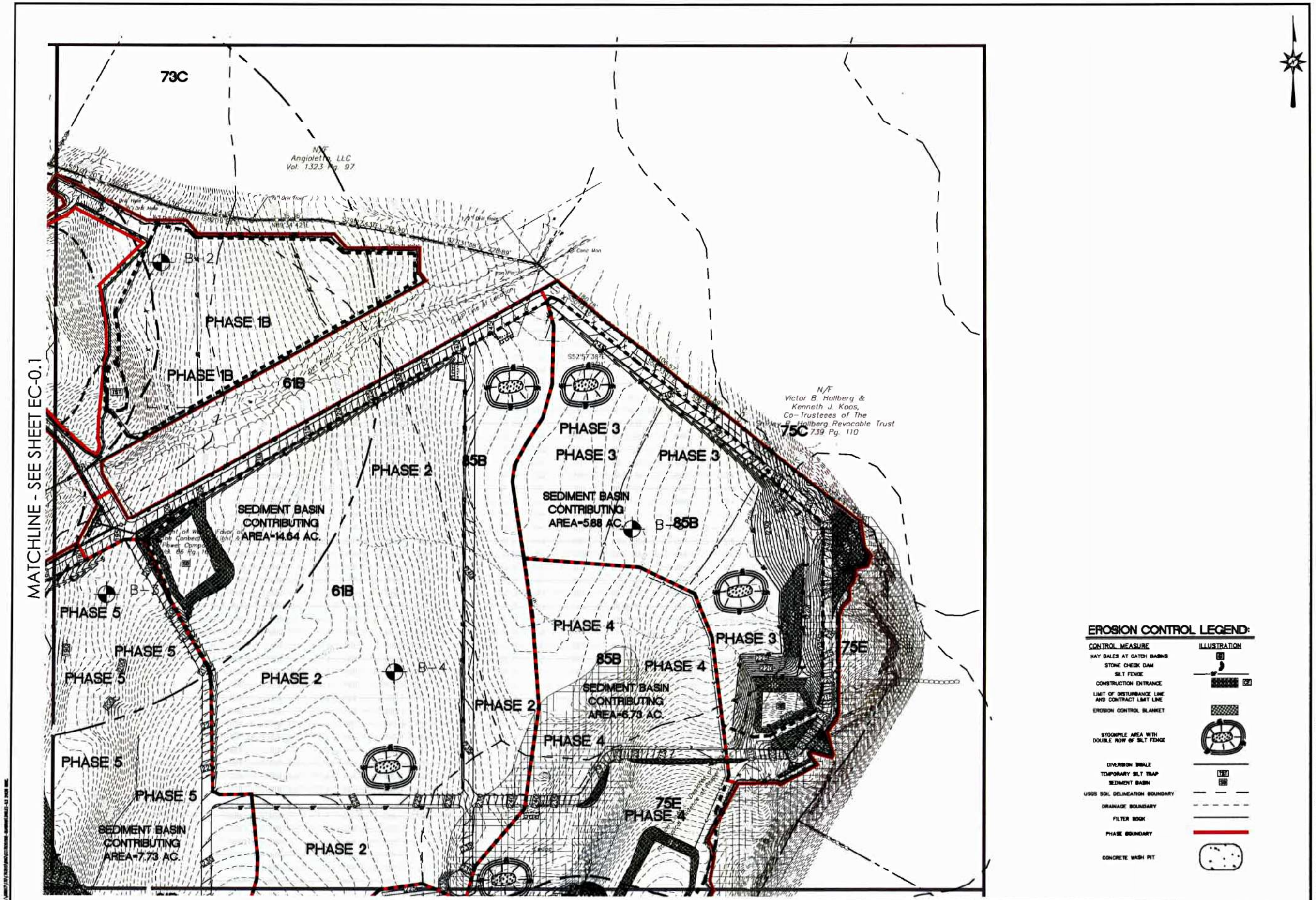
Scale 1"=80'
Project No. 170.3515
Date 07/20/2016
CAD File EC170.3515-02-QUADRANT

Title
OVERALL E&S CONTROL PLAN - QUADRANT EXHIBIT

Sheet No.
EC-0.1



EROSION CONTROL LEGEND:

CONTROL MEASURE	ILLUSTRATION
HAY BALES AT CATCH BASINS	
STONE CHECK DAM	
SILT FENCE	
CONSTRUCTION ENTRANCE	CE
LIMIT OF DISTURBANCE LINE AND CONTRACT LIMIT LINE	
EROSION CONTROL BLANKET	
STOCKPILE AREA WITH DOUBLE ROW OF SILT FENCE	
DIVERSION SWALE	
TEMPORARY SILT TRAP	T-1
SEDIMENT BASIN	SB
USGS SOIL DELINEATION BOUNDARY	
DRAINAGE BOUNDARY	
FILTER SOCK	
PHASE BOUNDARY	
CONCRETE WASH PIT	

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

FOR PERMITTING PURPOSES ONLY NOT RELEASED FOR CONSTRUCTION

GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

Architecture
Engineering
Environmental
Land Surveying
BL Companies
355 Research Parkway
Meriden, CT 06450
(203) 630-1406
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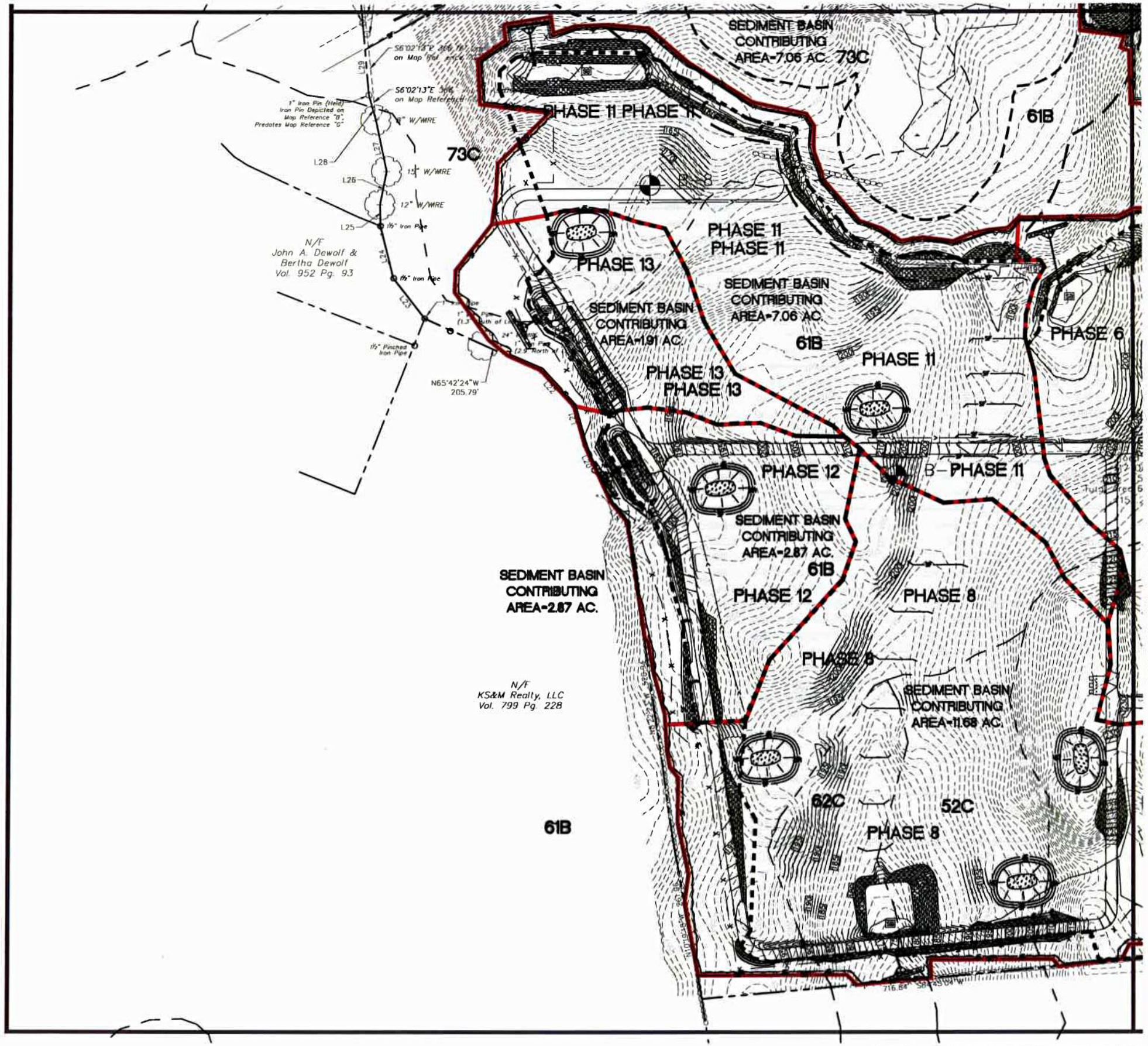
PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=80'
Project No. 17035115
Date 07/30/2018
CAD File: E017035115002-QUADRANT

Title
OVERALL E&S CONTROL PLAN - QUADRANT EXHIBIT

Sheet No.
EC-0.2

MATCHLINE - SEE SHEET EC-0.1



MATCHLINE - SEE SHEET EC-0.4

EROSION CONTROL LEGEND:

CONTROL MEASURE	ILLUSTRATION
HAY BALES AT CATCH BASINS	
STONE CHECK DAM	
SILT FENCE	
CONSTRUCTION ENTRANCE	
LIMIT OF DISTURBANCE LINE AND CONTRACT LIMIT LINE	
EROSION CONTROL BLANKET	
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TEMPORARY SILT TRAP	TRT
SEDIMENT BASIN	SB
USGS SOIL DELINEATION BOUNDARY	
DRAINAGE BOUNDARY	
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CONCRETE WASH PIT	

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SCALE IN FEET

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PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

Designed	H.J.L.
Drawn	H.J.L.
Reviewed	
Scale	1"=80'
Project No.	1703815
Date	07/30/2018
CAD File:	EC170381902-QUADRANT

Title: OVERALL E&S CONTROL PLAN - QUADRANT EXHIBIT

Sheet No.

EC-0.3

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MATCHLINE - SEE SHEET EC-0.2

MATCHLINE - SEE SHEET EC-0.3

61B
PHASE 4
61B
PHASE 7
PHASE 7
75E
PHASE 6
SEDIMENT BASIN
CONTRIBUTING
AREA-10.23 AC.
PHASE 6
PHASE 6
SEDIMENT BASIN
CONTRIBUTING
AREA-5.59 AC.
75E
62C
PHASE 6
PHASE 6
73C
PHASE 7
SEDIMENT TRAP
CONTRIBUTING
AREA-0.7 AC.
PHASE 6
SEDIMENT BASIN
CONTRIBUTING
AREA-10.23 AC.
PHASE 9
PHASE 8
PHASE 10
73C
SEDIMENT BASIN
CONTRIBUTING
AREA-2.07 AC.
75E
PHASE 8
PHASE 8
PHASE 10

S13°21'00"W
264.70'
S38°18'44"W
145.63'
S07°26"W
19'
S26°14"W
68.96'
S31°15'41"W
236.33'
S1°11'42"E
71.00'
S14°13'23"W
116.00'
S22°21'42"W
119.00'
N85°29'05"W
173.00'
N58°46'32"W
51.00'

N/F
Victor B. Hallberg & Kenneth J. Koos,
Co-Trusteees of The Shirley R. Hallberg
Revocable Trust
Vol. 739 Pg. 11

N/F
John Scagliotti
Vol. 1092 Pg. 349

EROSION CONTROL LEGEND:

CONTROL MEASURE	ILLUSTRATION
HAY BALES AT CATCH BASINS	
STONE CHECK DAM	
SILT FENCE	
CONSTRUCTION ENTRANCE	
LIMIT OF DISTURBANCE LINE AND CONTRACT LIMIT LINE	
EROSION CONTROL BLANKET	
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TEMPORARY SILT TRAP	
SEDIMENT BASIN	
USGS SOIL DELINEATION BOUNDARY	
DRAINAGE BOUNDARY	
FILTER SOCK	
PHASE BOUNDARY	
CONCRETE WASH PIT	

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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NOT RELEASED FOR CONSTRUCTION

GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

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PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=80'
Project No. 170365
Date 07/30/2018
CAD File 5217030100E-QUADRANT

Title
OVERALL E&S CONTROL PLAN - QUADRANT EXHIBIT

Sheet No.
EC-0.4

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EXHIBIT N

SITE WORK GENERAL NOTES

1. THESE PLANS ARE FOR PERMITTING PURPOSES ONLY AND ARE NOT FOR CONSTRUCTION.
2. ALL CONSTRUCTION SHALL COMPLY WITH THE PROJECT SPECIFICATION MANUAL; GREENSKIES RENEWABLE ENERGY STANDARDS, MUNICIPAL STANDARDS AND SPECIFICATIONS, CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS, 2010 ADA STANDARDS, AND STATE BUILDING CODE IN THE ABOVE REFERENCED INCREASING HIERARCHY. IF SPECIFICATIONS ARE IN CONFLICT, THE MORE STRINGENT SPECIFICATION SHALL APPLY. ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE OSHA, FEDERAL, STATE AND LOCAL REGULATIONS.
3. REFER TO OTHER PLANS BY OTHER DISCIPLINES, DETAILS AND PROJECT MANUAL FOR ADDITIONAL INFORMATION. THE CONTRACTOR SHALL VERIFY ALL SITE AND BUILDING CONDITIONS IN THE FIELD AND CONTACT THE CIVIL ENGINEER AND ARCHITECT IF THERE ARE ANY QUESTIONS OR CONFLICTS REGARDING THE CONSTRUCTION DOCUMENTS AND/OR FIELD CONDITIONS, SO THAT APPROPRIATE REVISIONS CAN BE MADE PRIOR TO BIDDING. ANY CONFLICT BETWEEN THE DRAWINGS AND SPECIFICATIONS SHALL BE CONFIRMED WITH THE OWNER'S CONSTRUCTION MANAGER PRIOR TO BIDDING.
4. DO NOT INTERRUPT EXISTING UTILITIES SERVICING FACILITIES OCCUPIED AND USED BY THE OWNER OR OTHERS DURING OCCUPIED HOURS EXCEPT WHEN SUCH INTERRUPTIONS HAVE BEEN AUTHORIZED IN WRITING BY THE OWNER AND THE LOCAL MUNICIPALITIES. INTERRUPTIONS SHALL ONLY OCCUR AFTER ACCEPTABLE TEMPORARY SERVICE HAS BEEN PROVIDED.
5. THE CONTRACTOR SHALL ABIDE BY ALL OSHA, FEDERAL, STATE, AND LOCAL REGULATIONS WHEN OPERATING CRANES, BOOMS, HOISTS, ETC. IN CLOSE PROXIMITY TO OVERHEAD ELECTRIC LINES. IF CONTRACTOR MUST OPERATE EQUIPMENT CLOSE TO ELECTRIC LINES, CONTACT POWER COMPANY TO MAKE ARRANGEMENTS FOR PROPER SAFEGUARDS. ANY UTILITY COMPANY FEES SHALL BE PAID FOR BY THE CONTRACTOR.
6. THE CONTRACTOR SHALL PROVIDE AS-BUILT RECORD DRAWINGS OF ALL CONSTRUCTION (INCLUDING UNDERGROUND UTILITIES AND STORMWATER SYSTEM) TO THE OWNER AT THE END OF CONSTRUCTION.
7. THE ARCHITECT OR ENGINEER IS NOT RESPONSIBLE FOR SITE SAFETY MEASURES TO BE EMPLOYED DURING CONSTRUCTION. THE ARCHITECT AND ENGINEER HAVE NO CONTRACTUAL DUTY TO CONTROL THE SAFEST METHODS OR MEANS OF THE WORK, JOB SITE RESPONSIBILITIES, SUPERVISION OR TO SUPERVISE SAFETY AND DOES NOT VOLUNTARILY ASSUME ANY SUCH DUTY OR RESPONSIBILITY.
8. THE CONTRACTOR SHALL COMPLY WITH CFR 29 PART 1926 FOR EXCAVATION, TRENCHING, AND TRENCH PROTECTION REQUIREMENTS.
9. INFORMATION ON EXISTING UTILITIES AND STORM DRAINAGE SYSTEMS HAS BEEN COMPILED FROM AVAILABLE INFORMATION INCLUDING UTILITY COMPANY AND MUNICIPAL OR COUNTY OR STATE RECORD MAPS AND/OR FIELD SURVEY AND IS NOT GUARANTEED CORRECT OR COMPLETE. UTILITIES AND STORM DRAINAGE SYSTEMS ARE SHOWN TO ALERT THE CONTRACTOR TO THEIR PRESENCE AND THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ACTUAL LOCATIONS AND ELEVATIONS OF ALL UNDERGROUND AND OVERHEAD UTILITIES AND STORM DRAINAGE SYSTEMS INCLUDING SERVICES. PRIOR TO DEMOLITION OR CONSTRUCTION, THE CONTRACTOR SHALL CONTACT CALL BEFORE YOU DIG (CBYD) 72 HOURS BEFORE COMMENCEMENT OF WORK AT (800) 922-4455 OR AT 811 AND VERIFY ALL UTILITY AND STORM DRAINAGE SYSTEM LOCATIONS. THE CONTRACTOR SHALL EMPLOY THE USE OF A UTILITY LOCATING COMPANY TO PROVIDE SUBSURFACE UTILITY ENGINEERING CONSISTING OF DESIGNATING UTILITIES AND STORM PIPING ON PRIVATE PROPERTY WITHIN THE CONTRACT LIMIT AND CONSISTING OF DESIGNATING AND LOCATING WHERE PROPOSED UTILITIES AND STORM PIPING CROSS EXISTING UTILITIES AND STORM PIPING WITHIN THE CONTRACT LIMITS.
10. DO NOT SCALE DRAWINGS. DIMENSIONS GOVERN OVER SCALED DIMENSIONS.
11. IF PLANS AND OR SPECIFICATIONS ARE IN CONFLICT, THE MOST COSTLY SHALL APPLY.
12. ALL CONTRACTORS AND SUBCONTRACTORS SHALL OBTAIN COMPLETE DRAWING PLAN SETS FOR BIDDING AND CONSTRUCTION. PLAN SETS OR PLAN SET ELECTRONIC POSTINGS SHALL NOT BE DISASSEMBLED INTO PARTIAL PLAN SETS FOR USE BY CONTRACTORS AND SUBCONTRACTORS OF INDIVIDUAL TRADES. IT SHALL BE THE CONTRACTOR'S AND SUBCONTRACTOR'S RESPONSIBILITY TO OBTAIN COMPLETE PLAN SETS OR COMPLETE PLAN SET ELECTRONIC POSTINGS FOR USE IN BIDDING AND CONSTRUCTION.
13. ALL NOTES AND DIMENSIONS DESIGNATED "TYPICAL" APPLY TO ALL LIKE OR SIMILAR CONDITIONS THROUGHOUT THE PROJECT.
14. CONTRACTOR(S) TO TAKE AND VERIFY ALL DIMENSIONS AND CONDITIONS OF THE WORK AND BE RESPONSIBLE FOR COORDINATION OF SAME. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO START OF WORK.
15. BL COMPANIES WILL PREPARE FINAL CONSTRUCTION DOCUMENTS SUITABLE FOR BIDDING AND CONSTRUCTION. PROGRESS SETS OF THESE DOCUMENTS ARE NOT SUITABLE FOR THOSE PURPOSES. IF CLIENT ELECTS TO SOLICIT BIDS OR ENTER INTO CONSTRUCTION CONTRACTS UTILIZING CONSTRUCTION DOCUMENTS THAT ARE NOT YET FINAL, CONSULTANT SHALL NOT BE RESPONSIBLE FOR ANY COSTS OR DELAY ARISING AS A RESULT.
16. NO CONSTRUCTION OR DEMOLITION SHALL BEGIN UNTIL APPROVAL OF THE FINAL PLANS IS GRANTED BY ALL GOVERNING AND REGULATORY AGENCIES.
17. THE OWNER IS RESPONSIBLE FOR OBTAINING ALL NECESSARY ZONING PERMITS REQUIRED BY GOVERNMENT AGENCIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT AND OBTAIN FROM MUNICIPAL SOURCES, ALL CONSTRUCTION PERMITS, INCLUDING STATE DOT PERMITS, SEWER AND WATER CONNECTION PERMITS, AND ROADWAY CONSTRUCTION PERMITS. THE CONTRACTOR SHALL POST ALL BONDS, PAY ALL FEES, PROVIDE PROOF OF INSURANCE AND PROVIDE TRAFFIC CONTROL NECESSARY FOR THIS WORK (EXCEPT CTDOT ENCROACHMENT PERMIT BOND).
18. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL PRODUCTS AND MATERIALS PER PLANS AND SPECIFICATIONS TO THE OWNER AND CIVIL ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION OR DELIVERY TO THE SITE. ALLOW A MINIMUM OF 14 WORKING DAYS FOR REVIEW.
19. THE CONTRACTOR SHALL FOLLOW THE SEQUENCE OF CONSTRUCTION NOTES PROVIDED ON THE SEDIMENT AND EROSION CONTROL PLAN.
20. SHOULD ANY UNCHARTED OR INCORRECTLY CHARTED, EXISTING PIPING OR OTHER UTILITY BE UNCOVERED DURING EXCAVATION, CONSULT THE CIVIL ENGINEER IMMEDIATELY FOR DIRECTIONS BEFORE PROCEEDING FURTHER WITH WORK IN THIS AREA.
21. ALL SITE DIMENSIONS ARE REFERENCED TO THE FACE OF CURBS OR EDGE OF PAVING AS APPLICABLE UNLESS OTHERWISE NOTED. ALL DIMENSIONS TO THE SOLAR PANELS ARE REFERENCED TO THE OUTSIDE FACE OF THE STRUCTURE.
22. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN TRAFFIC DEVICES FOR PROTECTION OF VEHICLES AND PEDESTRIANS CONSISTING OF DRUMS, BARRIERS, SIGNS, LIGHTS, FENCES, TEMPORARY WALKWAYS, TRAFFIC CONTROLLERS AND UNIFORMED TRAFFIC OFFICERS AS REQUIRED OR AS ORDERED BY THE ENGINEER OR AS REQUIRED BY THE LOCAL GOVERNING AUTHORITIES OR AS REQUIRED BY PERMIT STIPULATIONS OR AS REQUIRED BY THE OWNER. CONTRACTOR SHALL MAINTAIN ALL TRAFFIC LANES AND PEDESTRIAN WALKWAYS FOR USE AT ALL TIMES UNLESS WRITTEN APPROVAL FROM THE APPROPRIATE GOVERNING AGENCY IS GRANTED.
23. TRAFFIC CONTROL SIGNAGE SHALL CONFORM TO THE STATE DOT STANDARD DETAIL SHEETS AND THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. SIGNS SHALL BE INSTALLED PLUMB WITH THE EDGE OF THE SIGN 2' OFF THE FACE OF THE CURB, AND WITH 7' VERTICAL CLEARANCE UNLESS OTHERWISE DETAILED OR NOTED.
24. REFER TO DETAIL SHEETS FOR GRAVEL ACCESS ROAD STRUCTURE AND ADDITIONAL SITE INFORMATION.
25. THE CONTRACT LIMIT IS THE PROPERTY LINE UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE CONTRACT DRAWINGS.
26. THE CONTRACTOR SHALL RESTORE ANY UTILITY STRUCTURE, DRAINAGE STRUCTURE, PIPE, UTILITY, PAVEMENT, CURBS, SIDEWALKS, LANDSCAPED AREAS, SWALE, PAVEMENT MARKINGS, OR SIGNAGE DISTURBED DURING DEMOLITION AND/OR CONSTRUCTION TO THEIR ORIGINAL CONDITION OR BETTER, AS APPROVED BY THE CIVIL ENGINEER, AND TO THE SATISFACTION OF THE DEVELOPER AND TOWN OF WATERFORD.
27. EXISTING BOUNDARY AND TOPOGRAPHY IS BASED ON DRAWING TITLED "BOUNDARY SURVEY, ROSALIE IRENE MAGUIRE & TODD CARL WILLIS, 117 OIL MILL ROAD, WATERFORD, CONNECTICUT" SCALE 1"=100', DATED 2/22/2018, BY BL COMPANIES INC.
28. ALTERNATIVE METHODS AND PRODUCTS OTHER THAN THOSE SPECIFIED MAY BE USED IF REVIEWED AND APPROVED BY THE OWNER, CIVIL ENGINEER, AND APPROPRIATE REGULATORY AGENCY PRIOR TO INSTALLATION DURING THE BIDDING PROCESS.
29. CTDOT ENCROACHMENT PERMIT SHALL BE OBTAINED BY CONTRACTOR WHO SHALL PAY ALL FEES, PROVIDE PROOF OF INSURANCE AND PROVIDE TRAFFIC PROTECTION NECESSARY FOR THE WORK. THE OWNER SHALL POST CTDOT ENCROACHMENT PERMIT BOND.
30. AN EROSION CONTROL BOND IS REQUIRED TO BE POSTED BY THE CONTRACTOR BEFORE THE START OF ANY ACTIVITY ON OR OFF SITE. THE AMOUNT OF THE EROSION CONTROL BOND WILL BE DETERMINED BY THE AUTHORITY HAVING JURISDICTION.
31. A PORTION OF THE PROJECT PARCEL, LOCATED IN THE NORTHWEST CORNER OF THE SITE AND LOCATED ALONG OIL MILL BROOK, IS INCLUDED WITHIN FEMA FLOOD HAZARD ZONE A (SHADED). NO BASE FLOOD ELEVATION IS KNOWN FOR OIL MILL BROOK. THE MAJORITY OF THE SITE IS LOCATED WITHIN ANY FEMA DESIGNATED FLOOD HAZARD AREAS.
32. THERE ARE WETLANDS LOCATED ON THE SITE AS INDICATED BY THE
33. CONSTRUCTION OCCURRING ON THIS SITE SHALL COMPLY WITH NFPA 241 STANDARD FOR SAFEGUARDING CONSTRUCTION, ALTERATION AND DEMOLITION OPERATIONS, AND CHAPTER 16 OF NFPA 1 UNIFORM FIRE CODE.
34. SEDIMENT AND EROSION CONTROLS AS SHOWN ON THE SEDIMENT AND EROSION CONTROL PLAN AND/OR DEMOLITION PLAN SHALL BE INSTALLED BY THE DEMOLITION CONTRACTOR PRIOR TO START OF DEMOLITION AND CLEARING AND GRUBBING OPERATIONS.
35. REMOVE AND DISPOSE OF ANY SIDEWALKS, FENCES, STAIRS, WALLS, DEBRIS AND RUBBISH REQUIRING REMOVAL FROM THE WORK AREA IN AN APPROVED OFF SITE LANDFILL, BY AN APPROVED HAULER. HAULER SHALL COMPLY WITH ALL REGULATORY REQUIREMENTS.
36. THE CONTRACTOR SHALL SECURE ALL PERMITS FOR HIS DEMOLITION AND DISPOSAL OF HIS DEMOLITION MATERIAL TO BE REMOVED FROM THE SITE. THE CONTRACTOR SHALL POST BONDS AND PAY PERMIT FEES AS REQUIRED. BUILDING DEMOLITION CONTRACTOR SHALL BE RESPONSIBLE FOR PERMITS AND DISPOSAL OF ALL BUILDING DEMOLITION DEBRIS IN AN APPROVED OFF-SITE LANDFILL.
37. ASBESTOS OR HAZARDOUS MATERIAL, IF FOUND ON SITE, SHALL BE REMOVED BY A LICENSED HAZARDOUS MATERIAL CONTRACTOR.
38. THE CONTRACTOR SHALL PREPARE ALL MANIFEST DOCUMENTS AS REQUIRED PRIOR TO COMMENCEMENT OF DEMOLITION.
39. THE CONTRACTOR SHALL CUT AND PLUG, OR ARRANGE FOR THE APPROPRIATE UTILITY PROVIDER TO CUT AND PLUG ALL SERVICE PIPING AT THE STREET LINE OR AT THE MAIN, AS REQUIRED BY THE UTILITY PROVIDER, OR AS OTHERWISE NOTED OR SHOWN ON THE CONTRACT DRAWINGS. ALL SERVICES MAY NOT BE SHOWN ON THIS PLAN. THE CONTRACTOR SHALL INVESTIGATE THE SITE PRIOR TO BIDDING TO DETERMINE THE EXTENT OF SERVICE PIPING TO BE REMOVED, CUT OR PLUGGED. THE CONTRACTOR SHALL PAY ALL UTILITY PROVIDER FEES FOR ABANDONMENTS AND REMOVALS.
40. THE CONTRACTOR SHALL PROTECT ALL IRON PINS, MONUMENTS AND PROPERTY CORNERS DURING DEMOLITION AND CONSTRUCTION ACTIVITIES. ANY CONTRACTOR DISTURBED PINS, MONUMENTS, AND OR PROPERTY CORNERS, ETC. SHALL BE RESET BY A LICENSED LAND SURVEYOR AT THE EXPENSE OF THE CONTRACTOR.
41. THE DEMOLITION CONTRACTOR SHALL STABILIZE THE SITE AND KEEP EROSION CONTROL MEASURES IN PLACE UNTIL THE COMPLETION OF HIS WORK OR UNTIL THE COMMENCEMENT OF WORK BY THE SITE CONTRACTOR, WHICHEVER OCCURS FIRST, AS REQUIRED OR DEEMED NECESSARY BY THE ENGINEER OR OWNER'S REPRESENTATIVE. THE SITE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR THE MAINTENANCE OF EXISTING EROSION AND SEDIMENTATION CONTROLS AND FOR INSTALLATION OF ANY NEW SEDIMENT AND EROSION CONTROLS AS PER THE SEDIMENT AND EROSION CONTROL PLAN, AT THAT TIME.
42. IF IMPACTED OR CONTAMINATED SOIL IS ENCOUNTERED BY THE CONTRACTOR, THE CONTRACTOR SHALL SUSPEND EXCAVATION WORK OF IMPACTED SOIL AND NOTIFY THE OWNER AND/OR OWNER'S ENVIRONMENTAL CONSULTANT PRIOR TO PROCEEDING WITH FURTHER WORK IN THE IMPACTED SOIL LOCATION UNTIL FURTHER INSTRUCTED BY THE OWNER AND/OR OWNER'S ENVIRONMENTAL CONSULTANT.
43. IF APPLICABLE, THE CONTRACTOR IS RESPONSIBLE FOR SECURING A DEMOLITION PERMIT FROM THE TOWN OF WATERFORD BUILDING DEPARTMENT AND MUST FURNISH THE REQUIRED APPLICATION MATERIAL AND PAY ALL FEES.
44. BACK FILL DEPRESSIONS, FOUNDATION HOLES AND REMOVED DRIVEWAY AREAS IN LOCATIONS NOT SUBJECT TO FURTHER EXCAVATION WITH SOIL MATERIAL APPROVED BY THE OWNER'S GEOTECHNICAL ENGINEER AND COMPACT, FERTILIZE, SEED AND MULCH DISTURBED AREAS NOT SUBJECT TO FURTHER SITE CONSTRUCTION. DEMOLISHED BUILDING FOUNDATION AREA AND BASEMENT IF PRESENT TO BE BACKFILLED WITH GRAVEL FILL OR MATERIAL SPECIFIED IN THE PROJECT GEOTECHNICAL REPORT IN LIFT THICKNESS SPECIFIED IN THE GEOTECHNICAL REPORT, COMPACT TO 95% MAX. DRY DENSITY PER ASTM D1557 AT MOISTURE CONTENT SPECIFIED IN GEOTECHNICAL REPORT AND EARTHWORK SPECIFICATION. EMPLOY WATERING EQUIPMENT FOR DUST CONTROL.
45. THE CONTRACTOR SHALL REPAIR PAVEMENTS BY INSTALLING TEMPORARY AND PERMANENT PAVEMENTS IN PUBLIC RIGHTS OF WAYS AS REQUIRED BY LOCAL GOVERNING AUTHORITIES AND THE STATE AND PER PERMIT REQUIREMENTS DUE TO DEMOLITION AND PIPE REMOVAL ACTIVITIES.
46. NO WORK ON THIS SITE SHALL BE INITIATED BY THE CONTRACTOR UNTIL A PRE-CONSTRUCTION MEETING WITH OWNER AND THE CIVIL ENGINEER IS PERFORMED. THE CONTRACTOR SHOULD BE AWARE OF ANY SITE INFORMATION AVAILABLE SUCH AS GEOTECHNICAL AND ENVIRONMENTAL REPORTS. THE CONTRACTOR SHALL HAVE CBYD MARK OUTS OF EXISTING UTILITIES COMPLETED PRIOR TO MEETING.
47. THE CONTRACTOR SHALL ARRANGE FOR AND INSTALL TEMPORARY OR PERMANENT UTILITY CONNECTIONS WHERE INDICATED ON PLAN OR AS REQUIRED. MAINTAIN UTILITY SERVICES TO BUILDINGS OR TO SERVICES TO REMAIN. CONTRACTOR TO COORDINATE WITH UTILITY PROVIDERS FOR INSTALLATION AND PAY UTILITY PROVIDER FEES.
48. THE CONTRACTOR SHALL NOT COMMENCE DEMOLITION OR UTILITY DISCONNECTIONS UNTIL AUTHORIZED TO DO SO BY THE OWNER.
49. THE CONTRACTOR OR DEMOLITION CONTRACTOR SHALL INSTALL TEMPORARY SHEETING OR SHORING AS NECESSARY TO PROTECT EXISTING AND NEW BUILDINGS, STRUCTURES AND UTILITIES DURING CONSTRUCTION AND DEMOLITION. SHEETING OR SHORING SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER, LICENSED IN THIS STATE AND EVIDENCE OF SUCH SUBMITTED TO THE OWNER PRIOR TO INSTALLATION.
50. NO SALVAGE SHALL BE PERMITTED UNLESS PAID TO THE OWNER AS A CREDIT.
51. THE CONTRACTOR SHALL PRESERVE EXISTING VEGETATION WHERE POSSIBLE AND/OR AS NOTED ON DRAWINGS. REFER TO SEDIMENT AND EROSION CONTROL PLAN FOR LIMIT OF DISTURBANCE AND EROSION CONTROL NOTES.
52. TOPSOIL SHALL BE STRIPPED AND STOCKPILED ON SITE FOR USE IN FINAL LANDSCAPING.
53. THE CONTRACTOR SHALL COMPACT FILL IN LIFT THICKNESS PER THE GEOTECHNICAL REPORT UNDER ALL PARKING, BUILDING, DRIVE, AND STRUCTURE AREAS TO 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR TEST), OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
54. UNDERDRAINS SHALL BE ADDED, IF DETERMINED NECESSARY IN THE FIELD BY THE OWNER/GEOTECHNICAL ENGINEER, AFTER SUBGRADE IS ROUGH GRADED.
55. VERTICAL DATUM IS NAVD 88.
56. CLEARING LIMITS SHALL BE PHYSICALLY MARKED IN THE FIELD AND APPROVED BY THE TOWN OF WATERFORD AGENT PRIOR TO THE START OF WORK ON THE SITE.
57. PROPER CONSTRUCTION PROCEDURES SHALL BE FOLLOWED ON ALL IMPROVEMENTS WITHIN THIS PARCEL SO AS TO PREVENT THE SILTING OF ANY WATERCOURSE OR WETLANDS IN ACCORDANCE WITH THE REGULATIONS OF THE CT DEEP AND THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, LATEST EDITION. IN ADDITION, THE CONTRACTOR SHALL STRICTLY ADHERE TO THE SEDIMENT AND EROSION CONTROL PLAN CONTAINED HEREON. THE CONTRACTOR SHALL BE RESPONSIBLE TO POST ALL BONDS AS REQUIRED BY THE LOCAL MUNICIPALITIES WHICH WOULD GUARANTEE THE PROPER IMPLEMENTATION OF THE PLAN.
58. ALL SITE WORK, MATERIALS OR CONSTRUCTION, AND CONSTRUCTION METHODS FOR EARTHWORK AND STORM DRAINAGE WORK SHALL CONFORM TO THE SPECIFICATIONS AND DETAILS AND APPLICABLE SECTIONS OF THE PROJECT SPECIFICATIONS MANUAL. OTHERWISE THIS WORK SHALL CONFORM TO THE STATE DEPARTMENT OF TRANSPORTATION SPECIFICATIONS AND PROJECT GEOTECHNICAL REPORT IF THERE IS NO PROJECT SPECIFICATIONS MANUAL. ALL FILL MATERIAL UNDER STRUCTURES AND PAVED AREAS SHALL BE PER THE ABOVE STATED APPLICABLE SPECIFICATIONS, AND/OR PROJECT GEOTECHNICAL REPORT, AND SHALL BE PLACED IN ACCORDANCE WITH THE APPLICABLE SPECIFICATIONS UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL ENGINEER. MATERIAL SHALL BE COMPACTED IN LIFT THICKNESSES PER THE PROJECT GEOTECHNICAL REPORT TO 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 1557 AT MOISTURE CONTENT INDICATED IN PROJECT GEOTECHNICAL REPORT.
59. ALL DISTURBANCE INCURRED TO MUNICIPAL AND STATE PROPERTY DUE TO CONSTRUCTION SHALL BE RESTORED TO ITS PREVIOUS CONDITION OR BETTER, TO THE SATISFACTION OF THE MUNICIPALITY, COUNTY AND STATE AS APPLICABLE FOR THE LOCATION OF THE WORK.
60. ALL CONSTRUCTION WITHIN A DOT RIGHT OF WAY SHALL COMPLY WITH ALL DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS.
61. THE UTILITY PLAN DETAILS SITE INSTALLED PIPES UP TO 5' FROM THE BUILDING FACE. REFER TO PHOTOVOLTAIC PROTECTION CONTROL AND SCADA SCHEMATIC PLAN SHEET PV-1. SITE CONTRACTOR SHALL SUPPLY AND INSTALL PIPE ADAPTERS AS NECESSARY AT BUILDING CONNECTION POINT OR AT EXISTING UTILITY OR PIPE CONNECTION POINT.
62. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY THE ELEVATION AND LOCATION OF ALL UTILITIES BY VARIOUS MEANS PRIOR TO BEGINNING ANY EXCAVATION. TEST PITS SHALL BE DUG AT ALL LOCATIONS WHERE PROPOSED SANITARY SEWERS AND WHERE PROPOSED STORM PIPING WILL CROSS EXISTING UTILITIES, AND THE HORIZONTAL AND VERTICAL LOCATIONS OF THE UTILITIES SHALL BE DETERMINED. THE CONTRACTOR SHALL CONTACT THE CIVIL ENGINEER IN THE EVENT OF ANY DISCOVERED OR UNFORESEEN CONFLICTS BETWEEN EXISTING AND PROPOSED SANITARY SEWERS, STORM PIPING AND UTILITIES SO THAT AN APPROPRIATE MODIFICATION MAY BE MADE.
63. UTILITY CONNECTION DESIGN AS REFLECTED ON THE PLAN MAY CHANGE SUBJECT TO UTILITY PROVIDER AND GOVERNING AUTHORITY STAFF REVIEW.
64. THE CONTRACTOR SHALL ENSURE THAT ALL UTILITY PROVIDERS AND GOVERNING AUTHORITY STANDARDS FOR MATERIALS AND CONSTRUCTION METHODS ARE MET. THE CONTRACTOR SHALL PERFORM PROPER COORDINATION WITH THE RESPECTIVE UTILITY PROVIDER.
65. THE CONTRACTOR SHALL ARRANGE FOR AND COORDINATE WITH THE RESPECTIVE UTILITY PROVIDERS FOR SERVICE INSTALLATIONS AND CONNECTIONS. THE CONTRACTOR SHALL COORDINATE WORK TO BE PERFORMED BY THE VARIOUS UTILITY PROVIDERS AND SHALL PAY ALL FEES FOR CONNECTIONS, DISCONNECTIONS, RELOCATIONS, INSPECTIONS, AND DEMOLITION UNLESS OTHERWISE STATED IN THE PROJECT SPECIFICATIONS MANUAL AND/OR GENERAL CONDITIONS OF THE CONTRACT.
66. ALL EXISTING PAVEMENT WHERE UTILITY PIPING IS TO BE INSTALLED SHALL BE SAW CUT. AFTER UTILITY INSTALLATION IS COMPLETED, THE CONTRACTOR SHALL INSTALL TEMPORARY AND/OR PERMANENT PAVEMENT REPAIR AS DETAILED ON THE DRAWINGS OR AS REQUIRED BY THE OWNER HAVING JURISDICTION.
67. ALL PIPES SHALL BE LAID ON STRAIGHT ALIGNMENTS AND EVEN GRADES USING A PIPE LASER OR OTHER ACCURATE METHOD.
68. RELOCATION OF UTILITY PROVIDER FACILITIES SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY PROVIDER.
69. THE CONTRACTOR SHALL COMPACT THE PIPE BACKFILL IN 8" LIFTS ACCORDING TO THE PIPE BEDDING DETAILS. TRENCH BOTTOM SHALL BE STABLE IN HIGH GROUNDWATER AREAS. A PIPE FOUNDATION SHALL BE USED PER THE TRENCH DETAILS AND IN AREAS OF ROCK EXCAVATION.
70. ALL UTILITY CONSTRUCTION IS SUBJECT TO INSPECTION FOR APPROVAL PRIOR TO BACKFILLING, IN ACCORDANCE WITH THE APPROPRIATE UTILITY PROVIDER REQUIREMENTS.
71. A ONE-FOOT MINIMUM VERTICAL CLEARANCE BETWEEN WATER, GAS, ELECTRICAL, AND TELEPHONE LINES AND STORM PIPING SHALL BE PROVIDED. A SIX-INCH MINIMUM CLEARANCE SHALL BE MAINTAINED BETWEEN STORM PIPING AND SANITARY SEWER WITH A CONCRETE ENCASEMENT. AN 18-INCH TO 6-INCH VERTICAL CLEARANCE BETWEEN SANITARY SEWER PIPING AND STORM PIPING SHALL REQUIRE CONCRETE ENCASEMENT OF THE PROPOSED PIPING.
72. THE CONTRACTOR SHALL ARRANGE AND COORDINATE WITH UTILITY PROVIDERS FOR WORK TO BE PERFORMED BY UTILITY PROVIDERS. THE CONTRACTOR SHALL PAY ALL UTILITY FEES UNLESS OTHERWISE STATED IN THE PROJECT SPECIFICATION MANUAL AND GENERAL CONDITIONS, AND REPAIR PAVEMENTS AS NECESSARY.
73. ELECTRIC SERVICES SHALL BE INSTALLED UNDERGROUND TO THE TERMINUS OF THE SITE ACCESS DRIVEWAY AT OIL MILL ROAD AND IN THE VICINITY OF SERVICE POLE CLAMP #2863 (LOCATION TO BE DETERMINED BY EVERSOURCE). THE CONTRACTOR SHALL PROVIDE AND INSTALL AND BACKFILL PVC CONDUITS FOR ELECTRIC SERVICE PRIMARY, PVC CONDUITS FOR ELECTRICAL SECONDARY PER BUILDING ELECTRICAL PLANS, (SCHEDULE 80 UNDER PAVEMENT, SCHEDULE 40 IN NON PAVEMENT AREAS). SERVICES MAY BE INSTALLED IN A COMMON TRENCH WITH 12" CLEAR SPACE BETWEEN. MINIMUM COVER IS 36" ON ELECTRIC CONDUITS, AND 24" ON TELECOMMUNICATIONS CONDUITS. SERVICES SHALL BE MARKED WITH MAGNETIC LOCATOR TAPE AND SHALL BE BEDDED, INSTALLED, AND BACKFILLED IN ACCORDANCE WITH ELECTRIC UTILITY PROVIDER, AND TELECOMMUNICATIONS COMPANY STANDARDS. GALVANIZED STEEL ELECTRICAL CONDUIT SHALL BE USED AT POLE AND TRANSFORMER LOCATIONS. INSTALL HANDHOLES AS REQUIRED TO FACILITATE INSTALLATION AND AS REQUIRED BY UTILITY PROVIDER. INSTALL TRAFFIC LOAD QUALIFIED HANDHOLES IN VEHICULAR AREAS. INSTALL CONCRETE ENCASEMENT ON PRIMARY ELECTRIC CONDUITS IF REQUIRED BY ELECTRIC UTILITY PROVIDER.
74. THE CONTRACTOR MAY SUBSTITUTE MASONRY STRUCTURES FOR PRECAST STRUCTURES IF APPROVED BY THE CIVIL ENGINEER AND ALLOWED BY THE GOVERNING AUTHORITY ENGINEER OR OTHER GOVERNING AUTHORITY.
75. PIPING SHALL BE LAID FROM DOWNGRADIENT END OF PIPE RUN IN AN UPGRADIENT DIRECTION WITH BELL END FACING UPGRADE IN THE DIRECTION OF PIPE LAYING.
76. ALL RCP SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-76; ALL RCP SHALL BE CLASS IV UNLESS OTHERWISE SHOWN. JOINTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-443.
77. HIGH DENSITY POLYETHYLENE (HDPE) STORM SEWER 12" OR GREATER IN DIAMETER SHALL BE HI-Q SURE-LOK 10.8 PIPE AS MANUFACTURED BY HANCOR INC. OR APPROVED EQUAL. HDPE PIPE SHALL HAVE SMOOTH INTERIOR AND CORRUGATED EXTERIOR AND SHALL MEET THE REQUIREMENTS OF AASHTO M294, TYPE S. PIPE SECTIONS SHALL BE JOINED WITH BELL-AND-SPIGOT JOINT MEETING THE REQUIREMENTS OF AASHTO M294. THE BELL SHALL BE AN INTEGRAL PART OF THE PIPE AND PROVIDE A MINIMUM PULL-APART STRENGTH OF 400 POUNDS. THE JOINT SHALL BE WATERTIGHT ACCORDING TO THE REQUIREMENTS OF ASTM D3212. GASKETS SHALL BE MADE OF POLYISOPRENE MEETING THE REQUIREMENTS OF ASTM F477. ALTERNATIVE HDPE PIPE MAY BE USED IF APPROVED BY THE ENGINEER AND OWNER'S CONSTRUCTION MANAGER PRIOR TO ORDERING.

DEFINITIONS

MUNICIPALITY SHALL MEAN TOWN OF WATERFORD

COUNTY SHALL MEAN NEW LONDON COUNTY

STATE SHALL MEAN STATE OF CONNECTICUT

WATER UTILITY PROVIDER SHALL MEAN TOWN OF WATERFORD WATER POLLUTION CONTROL AUTHORITY

SANITARY UTILITY PROVIDER SHALL MEAN CITY OF NEW LONDON DEPT. OF PUBLIC UTILITIES - WATER AND SEWER

GAS UTILITY PROVIDER SHALL MEAN EVERSOURCE ENERGY - GAS DISTRIBUTION

TELECOMMUNICATIONS UTILITY PROVIDER SHALL MEAN FRONTIER

ELECTRIC UTILITY PROVIDER SHALL MEAN EVERSOURCE ENERGY - ELECTRIC DISTRIBUTION

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

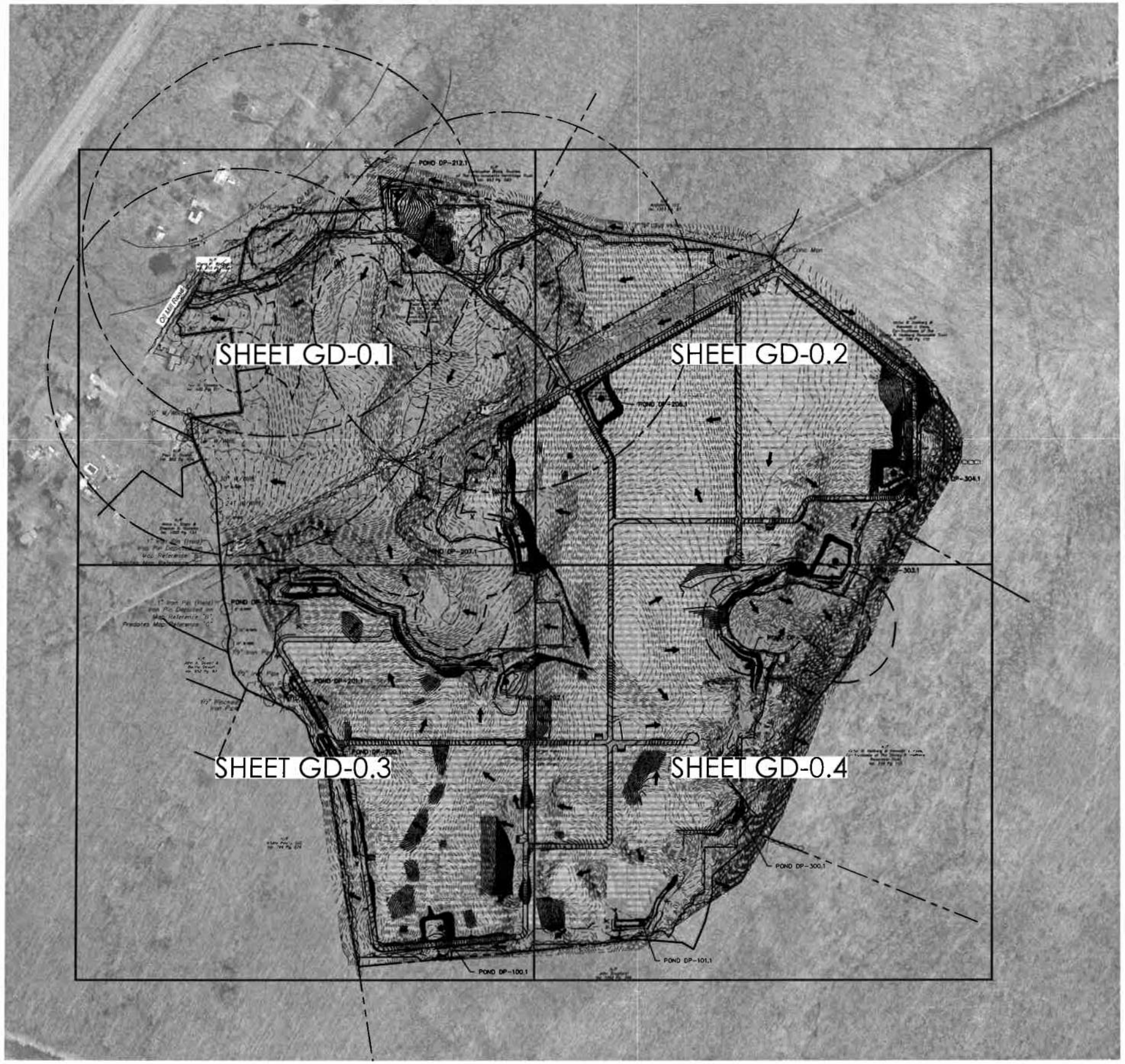
REVISIONS
No. Date Desc.

Designed	H.J.L.
Drawn	H.J.L.
Reviewed	
Scale	NONE
Project No.	170351.5
Date	07/30/2018
CAD File	GN170351.501

Title
GENERAL NOTES

Sheet No
GN-1

EXHIBIT O



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GRAPHIC SCALE
200 100 0 200
SCALE IN FEET

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PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

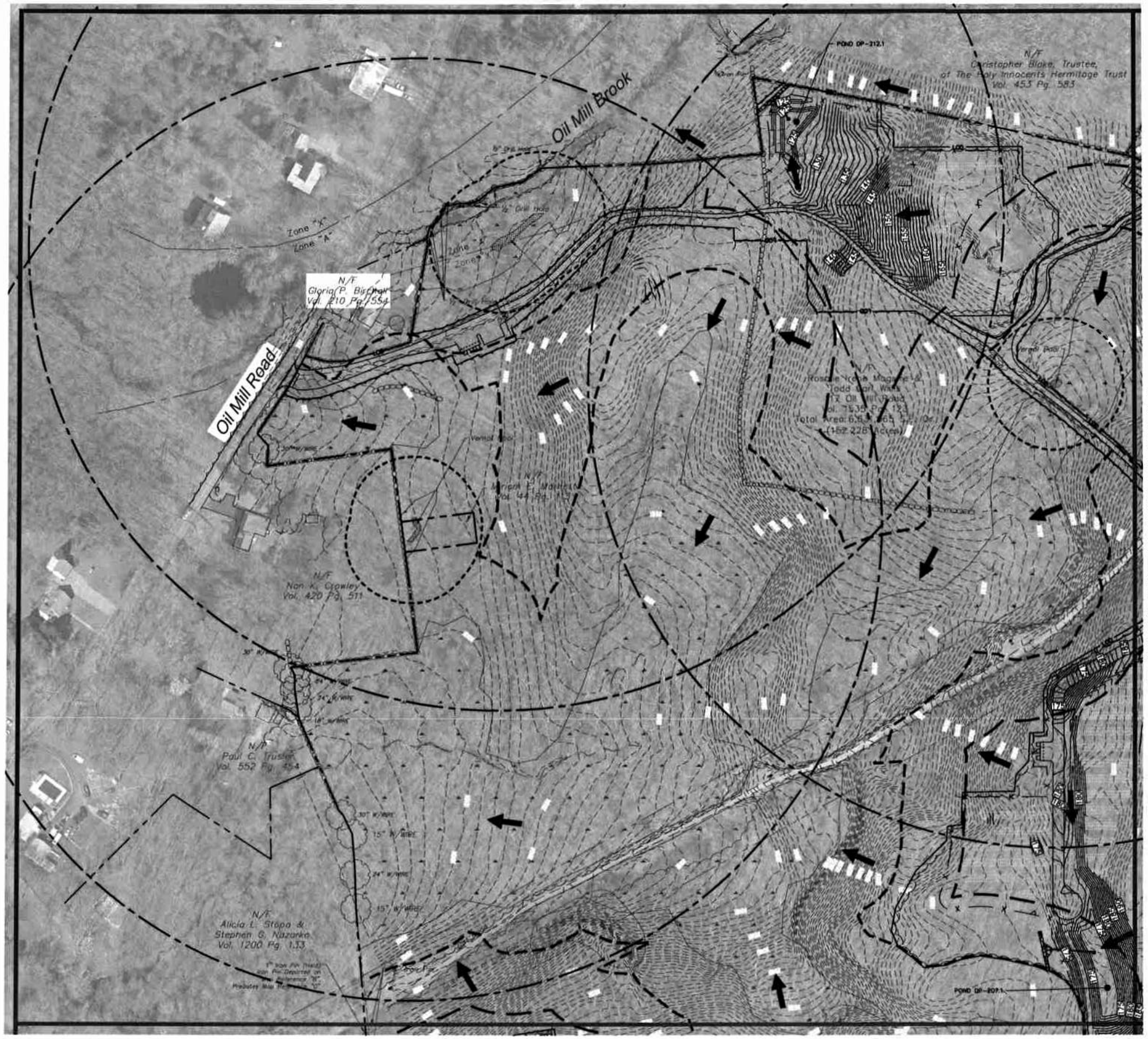
Date:

REVISIONS
No. Date

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=200'
Project No. 17D3515
Date 07/30/2018
CAD File: GD17D3515D-QUADRANT

Title
OVERALL GRADING AND DRAINAGE PLAN - QUADRANT EXHIBIT

Sheet No.
GD-0.0



MATCHLINE - SEE SHEET GD-0.2

MATCHLINE - SEE SHEET GD-0.3

LEGEND

- PROPERTY LINE
- EXISTING EASEMENT
- LIMITS OF DISTURBANCE/CONTRACT LIMIT LINE — LOD
- GROUND MOUNTED PHOTOVOLTAIC (PV) MODULES
- EXISTING WETLANDS
- 50'-100' WETLAND BUFFER (UNDISTURBED)
- 200' WETLAND BUFFER (REFER TO LANDSCAPING PLANS FOR CLEARING LIMITS AND PROPOSED PLANTINGS WITHIN BUFFER)
- EXISTING VERNAL POOL
- 100' VERNAL POOL ENVELOPE (VPE)
- 750' CRITICAL TERRESTRIAL HABITAT (CTH)
- EXISTING DIRT ACCESS ROAD
- BOLLARDS
- CONCRETE PAD (ELECTRIC UNIT)
- PROPOSED GRAVEL ACCESS ROAD
- BITUMINOUS DRIVEWAY APRON
- PROPOSED 7' HIGH CHAIN LINK FENCE — X — X —
- PROPOSED TREE LINE
- FLOW ARROW

GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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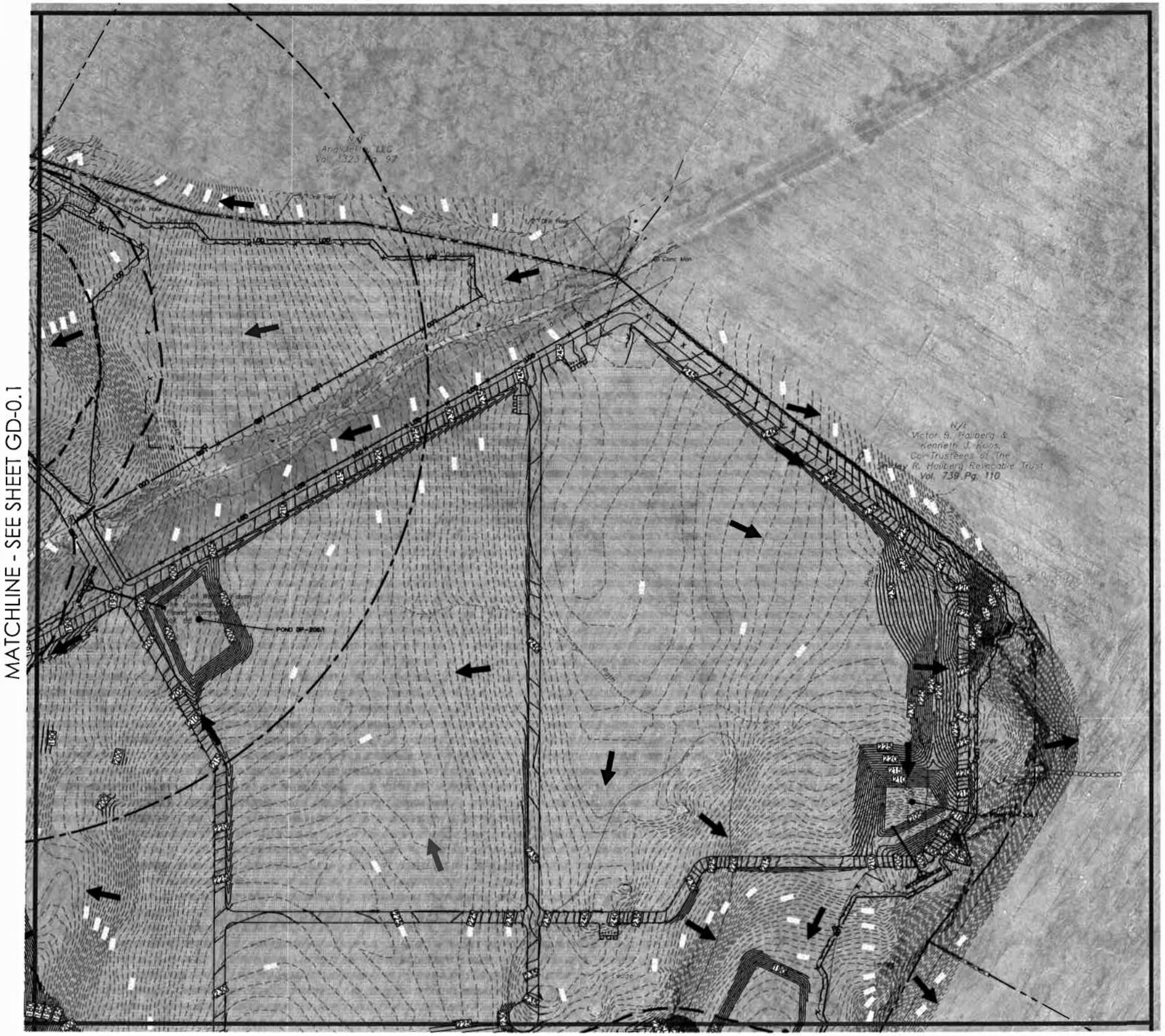
PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

Designed	H.J.L.
Drawn	H.J.L.
Reviewed	
Scale	1"=50'
Project No.	1703515
Date	07/30/2018
CAD File	GD1703515-02-QUADRANT

Title
OVERALL GRADING AND DRAINAGE PLAN - QUADRANT EXHIBIT

Sheet No.
GD-0.1

MATCHLINE - SEE SHEET GD-0.1



MATCHLINE - SEE SHEET GD-0.4

LEGEND

- PROPERTY LINE
- EXISTING EASEMENT
- LIMITS OF DISTURBANCE/CONTRACT LIMIT LINE — LOD
- GROUND MOUNTED PHOTOVOLTAIC (PV) MODULES
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- BITUMINOUS DRIVEWAY APRON
- PROPOSED 7' HIGH CHAIN LINK FENCE — X — X —
- PROPOSED TREE LINE
- FLOW ARROW

GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=20'
Project No. 170.3515
Date 07/30/2018
CAD File GD170351502-QUADRANT

Title
OVERALL GRADING AND DRAINAGE PLAN - QUADRANT EXHIBIT

Sheet No.
GD-0.2

MATCHLINE - SEE SHEET GD-0.1

MATCHLINE - SEE SHEET GD-0.4

LEGEND

- PROPERTY LINE
- EXISTING EASEMENT
- LIMITS OF DISTURBANCE/CONTRACT LIMIT LINE — LOD
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- PROPOSED GRAVEL ACCESS ROAD
- BITUMINOUS DRIVEWAY APRON
- PROPOSED 7' HIGH CHAIN LINK FENCE — X — X —
- PROPOSED TREE LINE
- FLOW ARROW

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

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PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

No.	Date	Desc.

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=50'
Project No. 170.3515
Date 07/30/2018
CAD File GD170351502-QUADRANT

Title
OVERALL GRADING AND DRAINAGE PLAN - QUADRANT EXHIBIT

Sheet No.
GD-0.3

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MATCHLINE - SEE SHEET GD-0.2

MATCHLINE - SEE SHEET GD-0.3

LEGEND

- PROPERTY LINE
- EXISTING EASEMENT
- LIMITS OF DISTURBANCE/CONTRACT LIMIT LINE — LOD
- GROUND MOUNTED PHOTOVOLTAIC (PV) MODULES
- EXISTING WETLANDS
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- 100' VERNAL POOL ENVELOPE (VPE)
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- EXISTING DIRT ACCESS ROAD
- BOLLARDS
- CONCRETE PAD (ELECTRIC UNIT)
- PROPOSED GRAVEL ACCESS ROAD
- BITUMINOUS DRIVEWAY APRON
- PROPOSED 7' HIGH CHAIN LINK FENCE — X — X —
- PROPOSED TREE LINE
- FLOW ARROW

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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GRAPHIC SCALE
80 40 0 80
SCALE IN FEET

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PHOTOVOLTAIC INSTALLATION
117 OIL MILL ROAD
WATERFORD, CONNECTICUT

No.	Date	Description

Designed H.J.L.
Drawn H.J.L.
Reviewed
Scale 1"=50'
Project No. 170.3515
Date 07/30/2018
CAD File: GD170351502-QUADRANT

Title
OVERALL GRADING AND DRAINAGE PLAN - QUADRANT EXHIBIT

Sheet No.
GD-0.4

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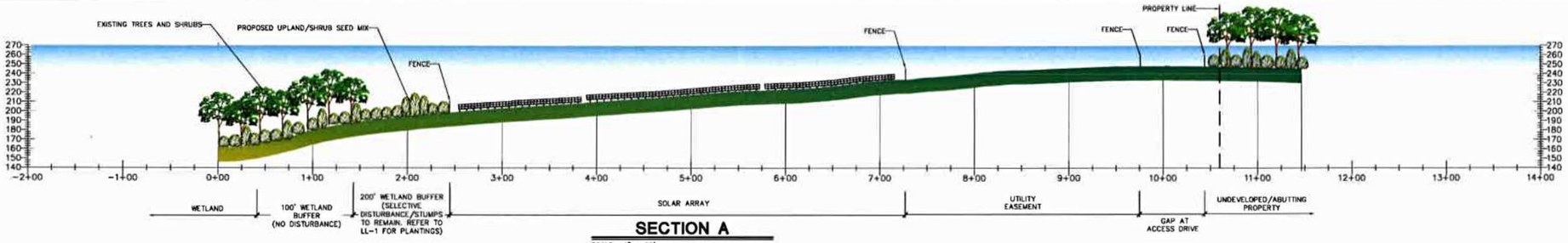
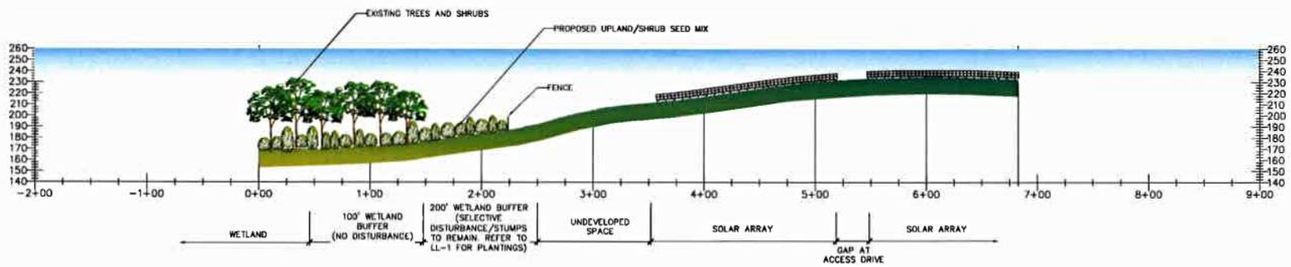
EXHIBIT P



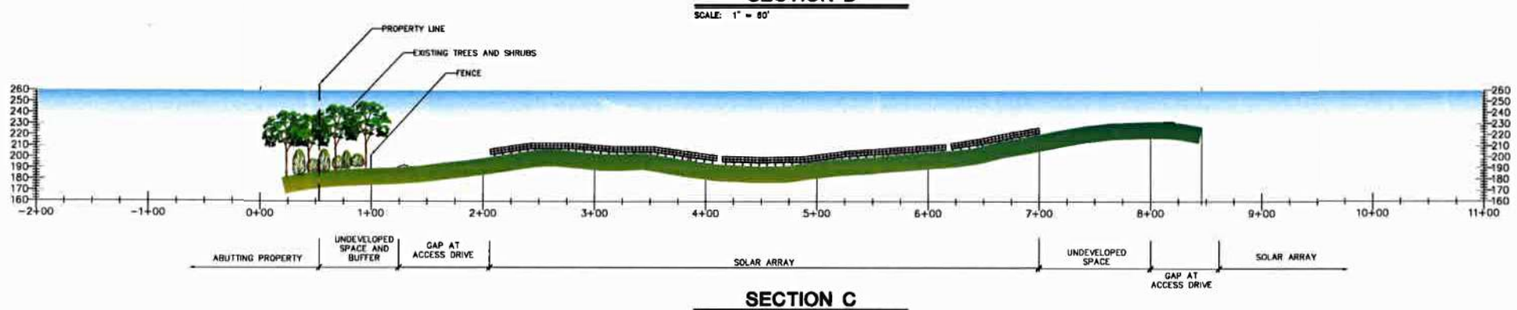
SECTION A

SCALE: 1" = 60'



SECTION B

SCALE: 1" = 60'

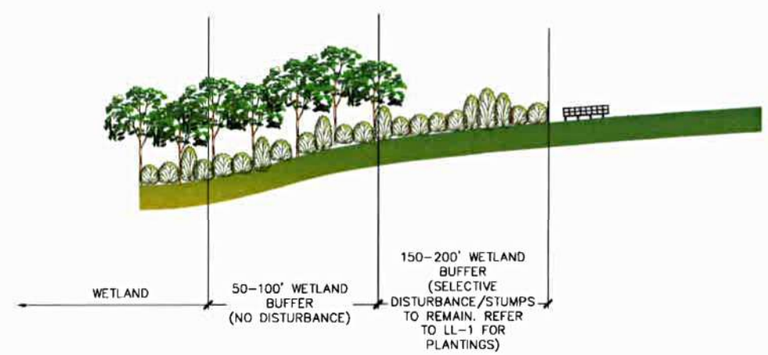


SECTION C

SCALE: 1" = 60'

INDEX PLAN

SCALE: 1" = 500'



TYPICAL CROSS SECTION

SCALE: N.T.S.

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PHOTOVOLTAIC INSTALLATION

117 OIL MILL ROAD

WATERFORD, CONNECTICUT

No.	Date	Description

Designed: L.M.W.
Drawn: L.M.W.
Reviewed:
Scale: SEE PLAN
Project No. 170.3815
Date: 07/30/2018
CAD File: CS170351501

Title: CROSS SECTION VIEWS

Sheet No. CS-1

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EXHIBIT Q

Terracon GeoReport

Geotechnical Engineering Report

Proposed Solar Power Facility
Waterford, Connecticut
May 22, 2018
Terracon Project No. J2185052

Prepared for:
BL Companies
Meriden, Connecticut

Prepared by:
Terracon Consultants, Inc.
Rocky Hill, Connecticut

BL Companies
355 Research Parkway
Meriden, Connecticut 06450

Attn: Mr. Michael Sullivan
P: (203) 630 1406
E: msullivan@blcompanies.com

Re: Geotechnical Engineering Report
Proposed Solar Power Facility
47-57 Oil Mill Road
Waterford, Connecticut
Terracon Project No. J2185052

Dear Mr. Sullivan:

We have completed the Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. PJ185052 dated April 17, 2018. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations for the proposed project. An environmental assessment was not part of this project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Jared C. Hall, G.I.T.
Field Geologist

Brian D. Opp, P.E.
Geotechnical Department Manager

REPORT TOPICS

REPORT SUMMARY I
INTRODUCTION 1
SITE CONDITIONS 1
CORROSIVITY 2
PROJECT DESCRIPTION 3
GEOTECHNICAL CHARACTERIZATION 3
GEOTECHNICAL OVERVIEW 6
EARTHWORK 7
PILE FOUNDATIONS 10
SEISMIC CONSIDERATIONS 16
BALLAST FOUNDATIONS AND EQUIPMENT SLABS 16
ROADWAYS 17
GENERAL COMMENTS 19

Note: This report was originally delivered in a web-based format. **Orange Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the Terracon GeoReport logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES
SITE LOCATION AND EXPLORATION PLANS
EXPLORATION RESULTS (Boring Logs and Laboratory Data)
SUPPORTING INFORMATION (General Notes, Unified Soil Classification System, and Description of Rock Properties)

REPORT SUMMARY

Topic [1]	Overview Statement [2]
Project Description	The construction of an approximately photovoltaic power facility consisting of approximately 62,700 panels over 152.2-acres. A 50-foot buffer will be constructed along the perimeter of the wetlands throughout the site.
Geotechnical Characterization	Native silty sands, occasional cobbles and boulders, underlain by bedrock. Bedrock was encountered in B-1 at a depth of 10 feet below existing grade. Probable bedrock was encountered in B-2 and B-4 through B-8 at depths of 10 to 20 feet. Groundwater was encountered while drilling at depths ranging from at grade to about 13 feet below existing grade while drilling in B-2 through B-5 and B-8.
Deep Foundations	Due to the presence of cobbles/boulders and bedrock, refusal to pile driving is anticipated to occur regularly across the site during the installation of production piles. In addition to piles encountering refusal to driving due to the presence of cobbles/boulders and/or bedrock, we anticipate the piles will likely rotate vertically and horizontally during driving as cobbles/boulders are encountered and the pile glances off of these large particles. If the minimum pile embedment depth cannot be obtained using conventional pile driving methods, an alternative would be to either underdrill no deeper than 6 inches short of their design depth or predrill oversize holes at each pile location to the minimum embedment depth prior to installation of the pile. Cement grout (controlled low-strength material [CLSM]) could also be considered to act as backfill material with the use of predrilled holes. Otherwise, alternative means of foundation support should be considered.
Shallow Foundations	As an alternative to deep foundation systems the panels may be supported on ballast foundations bearing on the ground surface.
Earthwork	Clearing and grubbing, minor grading.
General Comments	This section contains important information about the limitations of this geotechnical engineering report.

1. If the reader is reviewing this report as a PDF, the topics above can be used to access the appropriate section of the report by simply clicking on the topic itself.
2. This summary is for convenience only. It should be used in conjunction with the entire report for design purposes.

Geotechnical Engineering Report

Proposed Solar Power Facility
47-57 Oil Mill Road
Waterford, Connecticut

Terracon Project No. J2185052
May 22, 2018

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed Solar Power Facility to be located at 47-57 Oil Mill Road in Waterford, Connecticut. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Site preparation and earthwork
- Slab design and construction
- Seismic considerations
- Foundation design and construction

The geotechnical engineering scope of services for this project included the advancement of eight test borings (B-1 through B-8) to depths ranging from approximately 10 to 22 feet below ground surface.

Maps showing the site and boring locations are shown in the **Site Location** and **Exploration Plan** sections, respectively. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included on the boring logs and as separate graphs in the **Exploration Results** section of this report.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	Approximately 140-acre site located south of Oil Mill Road, east of its intersection with Parkway North, in the town of Waterford, Connecticut. (See Exhibit D)
Existing Improvements	Overhead electric transmission right of way in the central portion of the site, elsewhere the site is wooded.

Item	Description
Current Ground Cover	Forest mat.
Existing Topography [1]	The provided '*Site Plan*' depicts the site as being hilly terrain overall sloping downward toward the north. Additionally, wetland areas are depicted in areas other than the proposed solar arrays, in the central, northwestern, and eastern portions of the site.
Geology	The *Surficial Materials Map of Connecticut, 1992,* depicts soils within the vicinity of the site consist of a thin layer of glacial till. The *Bedrock Geological Map of Connecticut, 1985,* identifies that bedrock, at depth, underlying the site consists of gneiss and schist.

1. *'Site Plan'* by BL Companies of Meriden, Connecticut, Project No. 17D3515, Sheet No. SP-1, dated February 28, 2018.

CORROSIVITY

The table below lists the results of laboratory soluble sulfate, soluble chloride, pH, and conductivity testing performed on samples obtained from B-4 and B-7 at depths of about 5 to 7 and 2 to 4 feet, respectively. We have provided the inverse of the conductivity test results, electrical resistivity in Ω*cm, for your convenience. The reporting limits provided below represent the calibrated detection capabilities of the laboratory's testing equipment. The values may be used to estimate potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials which will be used for project construction.

Corrosivity Test Results Summary						
Boring Location	**Sample Depth (feet)**	**Soluble Sulfate (mg/kg)** [1]	**Soluble Chloride (mg/kg)** [1]	**Conductivity (µmho/cm)** [2]	**Resistivity (Ω*cm)** [3]	**pH**
B-4	5-7	5.2	Not Detected	23	43,480	7.1
B-7	2-4	6.9	Not Detected	11	90,910	5.5

1. Reporting Limit = 1.1 mg/kg
2. Reporting Limit = 2.0 µmho/cm
3. Calculated from Conductivity

These test results are provided to assist in determining the type and degree of corrosion protection that may be required. We recommend a certified corrosion engineer be employed to determine the need for corrosion protection and to design appropriate protective measures, if required.

PROJECT DESCRIPTION

Our initial understanding of the project was provided in our proposal and was discussed in the project planning stage. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Information Provided	*'Site Plan'* by BL Companies of Meriden, Connecticut, Project No. 17D3515, Sheet No. SP-1, dated February 28, 2018.
Project Description	The construction of an approximately photovoltaic power facility consisting of approximately 62,700 panels over 152.2-acres. A 50-foot buffer will be constructed along the perimeter of the wetlands throughout the site.
Array Construction	Rack-mounted solar panels supported by driven galvanized steel piles.
Maximum Loads	**Solar Panel Loads:** ■ Downforce: 1 to 2.5 kips (assumed) ■ Uplift: 2.5 kips (assumed) (does not consider frost heave) ■ Lateral: 2.5 kips at 4 to 7 feet above grade (assumed) **Equipment Slab Loads:** ■ 150 pounds per square foot (psf)
Grading/Slopes	Cuts and fills, up to about 3 feet, are anticipate for site development. Permanent cut slopes are not anticipated.
Access Roads	18-foot wide gravel access roads proposed throughout the array.

GEOTECHNICAL CHARACTERIZATION

Subsurface Profile

Subsurface conditions at the boring locations can be generalized as follows:

Stratum	Approximate Depth to Bottom of Stratum (feet)	Material Description	Consistency/Density
Surface	1 to 2	Forest mat: brown, friable and contained significant organic matter	N/A
Subsoil	2	Silty sand (SM), orange to brown. Encountered in B-1.	Loose

Stratum	Approximate Depth to Bottom of Stratum (feet)	Material Description	Consistency/Density
1	5 to 15	Silty sand (SM), trace to with gravel, occasional cobbles and boulders, brown to gray.	Medium dense to very dense
2 [1]	Extends beyond the limits of our explorations	Granitic gneiss, white and gray, completely weathered.	N/A

1. Encountered in B-1 and B-4.

Based on our exploration results, as well as our experience in the region, it is our opinion Stratum 1 is consistent with the mapped glacial till. B-3 terminated without refusal in the native sand and gravel at a depth of approximately 22 feet below ground surface. B-2 and B-4 through B-8 terminated upon auger refusal on a probable bedrock at depths of 10 to 20 feet. B-1 encountered weathered bedrock at a depth of 3.5 feet and was further advanced using the solid-stem auger until auger refusal on competent bedrock at a depth of 10 feet.

Conditions encountered at each exploration location are indicated on the individual exploration logs shown in the **Exploration Results** section and are attached to this report. Stratification boundaries on the exploration logs represent the approximate location of changes in soil / rock types; *in-situ*, the transition between materials may be gradual.

Groundwater Conditions

Groundwater was encountered while drilling from the ground surface to depths of about 13 feet in B-2 through B-5 and B-8, as tabulated below.

Boring Number	Approximate Depth to Groundwater while Drilling (feet)
B-2	0
B-3	5
B-4	1
B-5	2
B-8	13

Groundwater was not observed in the remaining borings while drilling or for the short duration the borings could remain open. However, this does not necessarily mean the borings terminated above groundwater, or the water levels summarized above are stable groundwater levels. Due to the low permeability of the soils encountered in the borings, a relatively long period may be necessary for a groundwater level to develop and stabilize in a borehole. Long term observations in piezometers or observation wells sealed from the influence of surface water are often required to define groundwater levels in materials of this type.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Additionally, groundwater may become temporarily perched above siltier portions of the native material and bedrock. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

In-Situ Electrical Resistivity Testing

On May 7, 2018, a Terracon field engineer completed two *in-situ* electrical resistivity tests (ER-1 and ER-2) in general accordance with ASTM G57 by the Wenner four probe method using a Megger DET5/4r earth resistivity meter. Each test consisted of two perpendicular arrays with electrode "A" spacings of about 5, 10, 20, 30, and 40 feet. The approximate locations and orientations of the resistivity lines are shown on the attached Exploration Plan. The results of our resistivity tests are tabulated below.

	Resistivity (ohm-cm)	
Electrode Spacing (feet)	**ER-1 (North – South)**	**ER-1 (East – West)**
5	212,565	251,825
10	179,435	308,315
20	106,090	240,140
30	85,600	160,285
40	90,390	146,305

	Resistivity (ohm-cm)	
Electrode Spacing (feet)	**ER-1 (Northeast – Southwest)**	**ER-1 (Northwest - Southeast)**
5	102,740	132,710
10	166,415	256,035
20	245,120	219,460
30	259,675	183,840
40	251,250	148,605

GEOTECHNICAL OVERVIEW

Based on our exploration results, subsurface conditions generally consist of medium dense to very dense native silty sands, occasional cobbles and boulders, underlain by bedrock. The depth to bedrock was variable throughout the site. Probable bedrock was encountered in B-2 and B-5 through B-8 at depths of about 10 to 20 feet below the ground surface. Completely weathered bedrock was encountered in B-1 and B-4 at depths of 3.5 and 13 feet and competent bedrock at depths of 10 and 15 feet, respectively.

Due to the presence of cobbles/boulders and bedrock, refusal to pile driving is anticipated to occur regularly across the site. We highly recommend a pile driving program be implemented to confirm the anticipated difficult pile driving conditions.

In addition to piles encountering refusal to driving due to the presence of cobbles/boulders and/or bedrock, we anticipate the piles will likely rotate vertically and horizontally during driving as cobbles/boulders are encountered and the pile glances off of these large particles. Pinching between cobbles/boulders is also a concern.

In areas of driven pile refusal, pile locations could be over-drilled to just above their design depth to remove potential obstructions in the upper portions of the native soils. The holes would then be backfilled with the cuttings less the cobbles and boulders as they are culled from the material. Depending on the depth of pre-drilling, this method will reduce the possibility for refusal as the depth of pre-drilling increases and the depth of native soils is reduced. As the depth of native soils are reduced between the bottom of the pre-drilled oversized hole and the design depth, the potential for pile driving refusal is reduced. We recommend all pre-drilled holes be drilled no deeper than 6 inches short of their design depth. Cement grout (controlled low-strength material [CLSM]) may be used as backfill around the piles. Terracon is available to provide further consultation for these potential foundation and/or alternatives upon request. A full discussion of our pile recommendations can be found in the **Pile Foundations** section.

The soils on this site are frost susceptible and therefore can exert a heaving force on the piles. If the anchorage of the foundations and the deadweight of the structures are not sufficient to resist these forces, they can cause uplift to structures. In cold weather climates, design to resist frost heave forces exerted on foundations is often the limiting factor in the foundation design. Specifically, pile lengths will need to be long enough to counteract potential heave forces in the seasonal frost zone.

Geotechnical engineering recommendations for piles driven to a minimum five-foot depth are outlined below. The recommendations contained in this report are based upon the results of field and laboratory testing, engineering analyses, and our current understanding of the proposed project.

As an alternative to deep foundation systems, the proposed solar panels may be supported at grade on ballast foundations bearing on the native silty sand. We recommend lightly-loaded equipment, i.e. ancillary equipment, inverters, transformers, etc., be supported on slabs deriving support from an at least 12-inch thick layer of Non-Frost Susceptible (NFS) Fill placed over the native silty sands or fill placed for site grading, the surface of which should be thoroughly compacted, as described in our **Ballast Foundations and Equipment Slabs** section.

Terracon should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations made during subgrade preparation; proof-rolling; placement and compaction of controlled compacted fills; backfilling of excavations in the completed subgrade; and for construction / installation of foundations

The **General Comments** section provides an understanding of the report limitations.

EARTHWORK

Earthwork will include clearing and grubbing, excavations, and fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria as necessary to render the site in the state considered in our geotechnical engineering evaluation for foundations, equipment slabs, and roadways.

Site Preparation

Forest mat / topsoil, organic subsoil (subsoil with visible roots), and any otherwise unsuitable materials should be removed prior to placing fill. The exposed subgrade should be proofrolled with at least six passes of a minimum 10-ton (static weight) vibratory roller compactor. Unsuitable material at the subgrade level should be removed and replaced with compacted Structural Fill. Fill may then be placed to attain the required grade.

Reuse of Onsite Materials

Based on available data, it is our opinion the native silty sand may be selectively reused as Common and Structural Fill, provided it is mixed with imported granular material such that it is close to meeting our gradation requirements provided in the table below. Reused material must be placed at moisture contents suitable for compaction purposes and be compacted to the densities recommended below. Cobbles and boulders should be culled from the material prior to reuse. Portions of the native silty sand contain relatively higher concentrations of fines which may make reuse less desirable, as these materials will be moisture sensitive and difficult to maintain at moisture levels suitable for compaction, particularly during periods of wet weather.

Fill Material Types

Fill and backfill should meet the following material property requirements.

Fill Type [1]	USCS Classification	Acceptable Location for Placement
Structural Fill [2]	GW, GW-GM, SW, SW-SM, SP, GP	All locations and elevations. Imported Structural Fill should meet the gradation requirements in Note 2 (below). Cobbles and boulders should be culled prior to reuse.
Common Fill [3]	Varies	Common Fill may be used for general site grading. Common Fill should not be used under settlement or frost-sensitive structures. Cobbles and boulders should be culled prior to reuse.
Non-Frost Susceptible (NFS) Fill [4]	GW, GP, SW, SP	All locations and elevations.
Crushed Stone	GP	For use on wet subgrades, as a replacement for Structural and NFS Fill (if desired), and as drainage fill. Should be uniform ¾-inch angular crushed stone wrapped in a geotextile separation fabric (Mirafi 140N, or similar).
Lean Concrete	Not applicable	Can be used to level subgrades between foundations and native soils. Lean concrete should be flowable, self-compacting concrete with a compressive strength between 300 and 2,000 psi.

1. Compacted fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used. Fill should not be placed on a frozen subgrade.
2. Imported Structural Fill should meet the following gradation specifications:

	Percent Passing by Weight
Sieve Size	**Structural Fill**
6"	100
3"	70 to 100
2"	(100)*
¾"	45 to 95
No. 4	30 to 90
No. 10	25 to 80
No. 40	10 to 50
No. 200	0 to 12

* Maximum 2-inch particle size within 12 inches of the underside of concrete elements

3. Common Fill should have a maximum particle size of 6 inches and no more than 25 percent by weight passing the No. 200 sieve.
4. Non-Frost Susceptible Fill should contain less than 5 percent material passing No. 200 sieve size.

Fill Compaction Requirements

Placed fill should meet the following compaction requirements.

Item	Description
Maximum fill lift thickness	■ 12 inches or less in loose thickness when heavy, self-propelled compaction equipment is used. ■ 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used.
Compaction Requirements [1]	95 percent maximum dry density (as determined by modified Proctor testing ASTM D1557, Method C)
Moisture Content – Granular Material	Workable moisture levels.

1. We recommend fill be tested for moisture content and compaction during placement. Should the results of the in-place density tests indicate the specified moisture or compaction limits have not been met, the area represented by the test should be reworked and retested, as required, until the specified moisture and compaction requirements are achieved.

Utility Trench Backfill

Trench excavations should be made with sufficient working space to permit construction, including backfill placement and compaction. As utility trenches can provide a conduit for groundwater flow, trenches should be backfilled with material that approximately matches the permeability characteristics of the surrounding soil. Should higher permeability fill be used in trenches, consideration should be given to installing seepage collars and/or check dams to reduce the likelihood of migration of water through the trenches.

Grading and Drainage

Adequate drainage should be provided at the site to reduce the likelihood of an increase in moisture content of the foundation soils. Surface drainage would likely consist of limited swales to control erosion and flow of runoff towards the equipment.

Earthwork Construction Considerations

Excavation penetrating the bedrock (if any) may require the use of specialized heavy-duty equipment, together with ripping or jack-hammering to advance the excavation and facilitate rock break-up and removal. Consideration should be given to obtaining a unit price for difficult excavation in the contract documents for the project.

Unstable subgrade conditions could develop during general construction operations, particularly if the soils are wetted and/or subjected to repetitive construction traffic. Should unstable subgrade conditions develop, stabilization measures will need to be employed.

Construction traffic over the completed subgrade should be avoided to the extent practical. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. If the subgrade should become frozen, wet, or disturbed, the affected material should be removed, or should be scarified, moisture conditioned, and recompacted.

As a minimum, temporary excavations should be sloped or braced, as required by Occupational Safety and Health Administration (OSHA) regulations, to provide stability and safe working conditions. The contractor, by his contract, is usually responsible for designing and constructing stable, temporary excavations and should shore, slope or bench the sides of the excavations, as required, to maintain stability of both the excavation sides and bottom. All excavations should comply with applicable local, State, and federal safety regulations, including the current OSHA Excavation and Trench Safety Standards.

Terracon should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during subgrade preparation; proofrolling; placement and compaction of controlled compacted fills; backfilling of excavations in the completed subgrade; and just prior to construction of foundations.

PILE FOUNDATIONS

We recommend the proposed photovoltaic panels be supported on driven piles advanced into the native silty sands. However, due to cobbles, boulders, and shallow bedrock, piles may refuse above their minimum embedment depth. Pre-drilling oversized holes short of their design depth to remove cobbles and boulders may be considered to drive piles to design depth. Design recommendations and construction considerations for our recommended methods are presented below.

Driven Pile Design Recommendations

The panels may be supported on driven steel piles, which should be structurally designed to resist compression, uplift, and bending forces. We recommend the piles be driven to a depth of 5 feet below finished grade (BFG), at a minimum, to achieve the required resistance. Greater embedment depths are anticipated to resist frost heave forces. The project Structural Engineer should determine the actual pile embedment depths. Corrosion protection should be applied to the steel piles, as required.

The soils on this site are frost susceptible and therefore can exert a heaving force on the piles. If the anchorage of the foundations and the deadweight of the structures are not sufficient to resist these forces, they can cause uplift to structures. In cold weather climates, design to resist frost heave forces exerted on foundations is often the limiting factor in the foundation design. Specifically, pile lengths will need to be long enough to counteract potential heave forces in the

seasonal frost zone. The seasonal frost zone for this site is 3½ feet, and therefore, the upper 3½ feet of soils should be ignored for use in resisting uplift or frost heave loading. Fully thawed soils in the upper 3½ feet are suitable for resistance of compression and lateral loads, but at the reduced values provided in the table below. The parameters in the table below have already been reduced to account for their reduced strength condition under spring thaw conditions.

Based on our review of soils samples and available published soil maps of the area, we recommend that a frost heave force of 1,000 psf acting along the pile perimeter to a depth of about 3½ feet below the ground surface should be considered. Lateral capacity of vertically installed driven piles is primarily dependent on the type and relative density/consistency of the soil against which the pile is pushed by the horizontal load. Driven piles should not exceed a lateral deflection of ½ inch at the ground surface.

We anticipate that the design length of the pile will be primarily dependent on the embedment/lateral capacity required to resist live loading, such as the combination of wind and ice loads. Technical specifications should be prepared that require material and installation detail submittals, and proof of experience in pile installation. A summary of our design parameters is provided in the table below.

Description	Value
Net Allowable End Bearing Capacity [1]	
Native silty sands / weathered rock	6 ksf
Competent Bedrock	10 ksf
Ultimate Skin Friction [2]	
Native silty sands (<3.5 ft) (Uplift Condition under fully thawed conditions)	250 psf
Native silty sands (<3.5 ft.) (Compression Condition under fully thawed conditions)	750 psf
Native silty sands / weathered rock (>3.5 ft)	1.5 ksf
L-Pile Material Type	
Native silty sands / weathered rock	Sand (Reese)
Competent bedrock	Weak Rock
Soil / Rock modulus parameter (k) [3]	
Native silty sands (wet) <3.5 ft (>3.5 ft)	40 pci (125 pci)
Native silty sands (dry) <3.5 ft (>3.5 ft)	60 pci (225 pci)
Weathered rock	225 pci
Angle of Internal Friction	
Native silty sands	34 degrees
Weathered rock	40 degrees
Competent bedrock	45 degrees

Description	Value
Estimated *In-situ* Soil / Rock Unit Weight	
Native silty sands	125 pcf
Weathered rock	140 pcf
Competent bedrock	145 pcf
Approximate Groundwater Depth (4/26/18 to 4/27/18)	0 to 13 feet
Minimum Depth for Frost Protection	42 inches

1. A factor of safety of 3 has been applied to end bearing.
2. Applicable to compression and uplift loading. The uplift capacity of the pile will be based on side friction and the dead weight of the piles. A factor of safety of at least 2 should be applied to the side resistance.
3. For use with L-Pile program.

We anticipate and recommend a pile load test program will be developed to better assess the ultimate skin friction and L-Pile parameters for design of the pile embedment depths on this project. If compression loading will control the design embedment depths of the piles, we would also recommend compression load testing be performed as part of the pile load test program. The design values obtained from a pile load test program are anticipated to be less conservative than the values provided in this report, and the factor of safety is also expected to be reduced. Design values from a pile load test program will be contingent upon obtaining a minimum drive time for each pile driven based on a specific hammer and equipment used during the driving of the piles during the pile load test program. If a different pile hammer and equipment are used by the contractor during construction, the minimum drive time will be adjusted accordingly.

Driven Pile Construction Considerations

Based on the field exploration and laboratory testing, it is our opinion on-site soils are not suitable for driven pile installation; and that areas of the site may encounter shallow bedrock and/or frequent boulders and difficulty or additional effort could be required for pile installation.

Underdrilling Considerations

In areas of driven pile refusal on cobbles and boulders, it may be appropriate to predrill a hole at the pile location to a depth less than the design depth of the pile. We recommend all pre-drilled holes be drilled no deeper than 6 inches short of their design depth. The predrilled hole may then be backfilled with the cuttings, provided cobbles and boulders are culled from the material. Underdrilling increases the likelihood of piles being driven to design depth; however, it does not completely eliminate the possibility of refusal. Additionally, the cuttings used as backfill would have reduced strength, as tabulated below.

Description	Value
Net Allowable End Bearing Capacity [1]	
Native silty sands / weathered rock	6 ksf
Competent Bedrock	10 ksf
Ultimate Skin Friction [2]	
Backfill cuttings (<3.5 ft) (Uplift Condition under fully thawed conditions)	125 psf
Backfill cuttings (<3.5 ft.) (Compression Condition under fully thawed conditions)	375 psf
Backfill cuttings (>3.5 ft)	750psf
Native silty sands / weathered rock (>3.5 ft)	1.5 ksf
L-Pile Material Type	
Backfill cuttings / Native silty sands / weathered rock	Sand (Reese)
Competent bedrock	Weak Rock
Soil / Rock modulus parameter (k) [3]	
Backfill cuttings (wet) <3.5 ft (>3.5 ft)	40 pci (60 pci)
Backfill cuttings (dry) <3.5 ft (>3.5 ft)	60 pci (90 pci)
Native silty sands (wet) <3.5 ft (> 3.5 ft)	40 pci (125 pci)
Native silty sands (dry) <3.5 ft (>3.5 ft)	60 pci (225 pci)
Weathered rock	225 pci
Angle of Internal Friction	
Backfill cuttings	32 degrees
Native silty sands	34 degrees
Weathered rock	40 degrees
Competent bedrock	45 degrees
Estimated *In-situ* Soil / Rock Unit Weight	
Backfill cuttings	120 pcf
Native silty sands	125 pcf
Weathered rock	140 pcf
Competent bedrock	145 pcf
Approximate Groundwater Depth (4/26/18 to 4/27/18)	0 to 13 feet
Minimum Depth for Frost Protection	42 inches

1. A factor of safety of 3 has been applied to end bearing.
2. Applicable to compression and uplift loading. The uplift capacity of the pile will be based on side friction and the dead weight of the piles. A factor of safety of at least 2 should be applied to the side resistance.
3. For use with L-Pile program.

Oversize Holes Design Recommendations

As an alternative to driven piles and pre-drilling oversized holes short of their design depth, an oversized hole drilled to the full design depth (overdrilling) may be advanced to the minimum embedment depth prior to the installation of piles and setting the pile in the hole. For this approach, the hole is to be backfilled using cement grout, i.e. controlled low-strength material (CLSM). This method may be appropriate in areas of shallow bedrock and/or frequent obstructions. Design parameters for oversize holes are provided below.

Description	Value
Net Allowable End Bearing Capacity [1]	
Native silty sands / weathered rock	6 ksf
Competent Bedrock	10 ksf
Ultimate Bond Resistance [2]	
Native silty sands / weathered rock (<3.5 ft)	Ignore
Native silty sands / weathered rock (>3.5 ft)	15 psi
Competent Bedrock	200 psi
L-Pile Material Type	
Native silty sands / weathered rock	Sand (Reese)
Competent bedrock	Weak Rock
Soil / Rock modulus parameter (k) [3]	
Native silty sands (wet) <3.5 ft (>3.5 ft)	40 pci (125 pci)
Native silty sands (dry) <3.5 ft (>3.5 ft)	60 pci (225 pci)
Weathered rock	225 pci
Angle of Internal Friction	
Native silty sands	34 degrees
Weathered rock	40 degrees
Competent Bedrock	45 degrees
Uniaxial Compressive Strength (psi) [3] Competent Bedrock	8,500 psi
Initial Modulus of Rock Mass (psi) [3] Competent Bedrock	1,100,000 psi
RQD Competent Bedrock	75
Strain Factor Competent Bedrock	0.00005
Estimated *In-situ* Soil/Rock Unit Weight	
Native silty sands	125 pcf
Weathered rock	140 pcf
Competent bedrock	145 pcf
Approximate Groundwater Depth (4/26/18 to 4/27/18)	0 to 13 feet

Description	Value
Minimum Depth for Frost Protection	42 inches
Minimum Drilled Hole Diameter	18 inches

1. The allowable end bearing capacity is based on the shaft terminating at least 18 inches below frost depth, i.e. minimum embedment of 5 feet. The allowable end bearing capacity assumes that loose material at the base of the shaft has been removed and that the base has not been disturbed or made unstable by an unbalanced hydrostatic pressure.
2. Applicable to compression and uplift loading. Contribution to pile capacity from above the frost depth of 3.5 feet should be ignored. The uplift capacity of the pile will be based on side friction and the dead weight of the piles. A factor of safety of at least 2 should be applied to the side resistance.
3. For use with L-Pile program.

The base of the oversize hole should be in the native silty sands or bedrock. The oversize hole will be designed to resist tension loads. Technical specifications should be prepared that require material and installation detail submittals, proof of experience in oversize hole installation, and concrete placement methods.

Oversize Hole Construction Considerations

Drilling to design depth should be possible with conventional single-flight power augers on the majority of the site; however, specialized drilling equipment may be required for very hard bedrock layers.

The drilled hole should be aligned vertically. The drilling method or combination of methods selected by the contractor should be submitted for review by Terracon, prior to mobilization of drilling equipment. Temporary casing may be required to reduce the likelihood of caving of the hole. If oversized holes extend below the groundwater table, drilling mud may also be required to stabilize the hole. Cobbles and boulders, which may impede the installation of oversize holes, were encountered throughout the site. Concrete should be placed by directing the concrete down the center of the hole in order to reduce the likelihood of hitting the pile and segregating. Groundwater, if encountered, should be removed prior to placing concrete.

SEISMIC CONSIDERATIONS

Description	Value
Code Used [1]	Connecticut State Building Code (SBC)
Site Class [2]	C
Maximum considered earthquake ground motions (5 percent damping) [3]	0.058 (1.0 second spectral response)
	0.161 (0.2 second spectral response)
Liquefaction potential in event of an earthquake	Not susceptible

1. The CT SBC incorporates the Seismic Design Category approach from the *2015 International Building Code (IBC)*.
2. The *IBC* uses a site soil profile determination extending to a depth of 100 feet for seismic site classification. The current scope requested does not include the required 100-foot soil profile determination; the borings performed for this report extended to a maximum depth of 22 feet. However, we expect that soils at least as dense as those encountered above a depth of 22 feet, or bedrock, will extend to at least 100 feet.
3. (Appendix N) Municipality – Specific Structural Design Parameters, per the 2016 CT SBC.

BALLAST FOUNDATIONS AND EQUIPMENT SLABS

As an alternative to deep foundation systems (i.e. driven steel piles, underdrilling, oversized holes), the photovoltaic panels may be supported at the ground surface using ballast foundations in a manner similar to the equipment slabs.

Lightly-loaded ancillary equipment supported on slabs and ballast foundations should be underlain by at least a 12-inch thickness of NFS Fill placed on proofrolled native silty sands or fill placed during site grading. Crushed Stone, wrapped in a geotextile separation fabric, may be used in place of NFS Fill, if desired.

Design recommendations and construction considerations for the recommended ballast foundations and equipment cabinet foundation systems are presented in the following table and paragraphs.

Ballast and Slab Design Parameters

Photovoltaic panels may be supported with precast ballasted foundations deriving support from the native silty sands or on NFS Fill placed over the native silty sands. In areas beneath proposed ballasted foundations, fill should be compacted to at least 95 percent of the maximum modified Proctor dry density (ASTM D1557, Method C). The native material is capable of supporting the imposed loads.

Item	Description
Slab Support	Minimum 12-inch thick layer of compacted NFS or Crushed Stone on proofrolled native silty sands or fill placed during site grading.
Estimated Modulus of Subgrade Reaction [1]	225 pounds per square inch per in (psi/in) for point loading.
Coefficient of Sliding Friction [2]	0.5 (ultimate)
Portland Cement Concrete [3]	Reinforced Portland Cement Concrete

1. Modulus of Subgrade Reaction considers the 12-inch thick layer of NFS or Crushed Stone.
2. A factor of safety of 1.5 should be applied to the sliding resistance
3. Minimum compressive strength of 4,000 psi with fiber mesh. Air entraining admixtures should be used for concrete exposed to freezing.

We recommend the 12-inch thick layer of compacted NFS beneath the slabs to provide both a uniform bearing surface and a capillary break. Slab foundations will move due to freeze-thaw effects. Consideration should be given to placing the NFS deeper, to a greater proportion of the frost depth (42 inches), depending on the tolerance for movement.

Ballast and Slab Construction Considerations

On most sites, the site grading is generally accomplished early in the construction phase. However, as construction proceeds, the subgrade may be disturbed by foundation excavations, construction traffic, rainfall, etc. As a result, the subgrade may not be suitable for placement of NFS Fill, and corrective action will be required.

We recommend the area underlying the slabs be rough graded and then proofrolled with a vibratory roller or heavy plate compactor prior to final grading and placement of NFS Fill. Particular attention should be paid to high traffic areas that were rutted and disturbed earlier and to areas previously filled or backfilled. Areas where unsuitable or unstable conditions are located should be repaired by removing and replacing the affected material with properly compacted NFS material.

ROADWAYS

General Comments

On most project sites, the site grading is accomplished relatively early in the construction phase. Fills are placed and compacted in a uniform manner. However, as construction proceeds, excavations occur, rainfall and surface water cause saturation, heavy traffic from concrete trucks and other delivery vehicles disturb the subgrade and many surface irregularities are filled in with

loose soils to improve trafficability. As a result, the roadway subgrades, initially prepared early in the project, should be carefully evaluated as the time for roadway construction approaches.

Prior to placement of roadway surfaces, the prepared subgrade should be proof-rolled using a loaded tandem-axle dump truck. Areas where unsuitable conditions are located should be repaired by replacing the materials with properly compacted fill. If significant precipitation occurs after the evaluation or if the surface becomes disturbed, the subgrade should be reviewed again by qualified personnel prior to placing the geotextile, recommended below. The subgrade should be in its finished form at the time of the final review.

The access road area subgrades should be properly sloped to direct water from beneath the drive area gravel section toward the edge, and/or down gradient. Collected water should be channeled away from the access road. Adequate sloping of the gravel surface will minimize the potential for ponding of water on or within proximity to the drive area, which will shorten the life of the gravel drive.

Gravel Access Road Design Recommendations

The gravel roadway design should consist of a 12-inch thickness of well-graded crushed stone, ranging in size from about ½-inch to 1¾-inch, placed over a prepared subgrade, as described in further detail below. A heavy-duty geotextile (Mirafi 500x, or similar) should be placed over the native sands prior to placing the crushed stone. The gravel roadway design is based on the assumption that the majority of the loading will occur during the construction phase of the project. After the proposed structures have been constructed or installed, we anticipate only occasional loads from lightly-loaded maintenance vehicles. A gravel road is prone to damage from oversized or heavily-loaded vehicles. Maintenance of the gravel road will be required. The level of maintenance will generally depend upon the amount of use. The gravel road may need occasional repairs if traveled upon by heavily-loaded vehicles.

Future performance of the gravel roadway constructed on the site will be partially dependent upon maintaining stable moisture content of the subgrade soil. The performance may be enhanced by reducing excess moisture that can reach the subgrade soils. The roadway surface and subgrade should be sloped to provide positive drainage at all times. In this regard the following recommendations are offered.

- Slope the finished ground surface adjacent to the roads at a minimum 2% grade away from the roadways.
- The subgrade and roadway surfaces should be constructed and maintained with a minimum 2% cross slope (crown) to promote proper surface drainage.
- Provide appropriate edge drainage.
- Provide swales and drainage
- Provide erosion protection over sloped surfaces and swales

Gravel Access Road Construction Considerations

The roadway subgrade, if prepared early in the project, should be carefully evaluated as the time for construction approaches. We recommend the roadway area be stripped of existing topsoil/organic subsoil, or otherwise unsuitable material, rough graded, and compacted with a heavy roller compactor without vibration, before being proof-rolled with a loaded tandem-axle dump truck. Particular attention should be paid to high traffic areas that were rutted and disturbed, and areas where backfilled trenches are located. Areas where unsuitable conditions are located should be repaired by replacing the materials with properly compacted fill. When proof-rolling/subgrade stabilization has been completed to the satisfaction of Terracon, the geotextile fabric may be placed followed by the crushed stone.

GENERAL COMMENTS

As the project progresses, we address assumptions by incorporating information provided by the design team, if any. Revised project information that reflects actual conditions important to our services is reflected in the final report. The design team should collaborate with Terracon to confirm these assumptions and to prepare the final design plans and specifications. This facilitates the incorporation of our opinions related to implementation of our geotechnical recommendations. Any information conveyed prior to the final report is for informational purposes only and should not be considered or used for decision-making purposes.

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in the final report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our scope of services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third party beneficiaries intended. Any third party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for third parties.

Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES

Field Exploration

Number of Borings	Boring Depth (feet)	Planned Location
8	10 to 22	Solar Array Area

Exploration Layout and Elevations: Terracon personnel provided the exploration layout. Coordinates were obtained with a handheld GPS unit (estimated horizontal accuracy of about ±10 feet). Elevations were not provided to Terracon prior to the preparation of this report.

Subsurface Exploration Procedures: Terracon advanced 8 test borings (B-1 through B-8) on April 26 and 27, 2018. The borings were advanced using an all-terrain vehicle (ATV)-mounted Diedrich D-50 drill rig using 4-inch diameter continuous solid-stem augers. In general, four samples were obtained in the upper 10 feet of the borings and at intervals of 5 feet thereafter.

In the split barrel sampling procedure, which was used to take soil samples in the test borings, the number of blows required to advance a standard 2 inch O.D. split barrel sampler typically the middle 12 inches of the total 24-inch penetration by means of a 140-pound autohammer with a free fall of 30 inches is the Standard Penetration Test (SPT) resistance value "N". This "N" value is used to estimate the in-situ relative density of cohesionless soils and consistency of cohesive soils.

The soil samples were placed in labeled glass jars and taken to our laboratory for further review and classification by a Terracon geotechnical engineer. Information provided on the exploration logs attached to this report includes soil/rock descriptions, relative density and/or consistency evaluations, exploration depths, sampling intervals, and groundwater conditions. The borings were backfilled with auger cuttings prior to the drill crew leaving the site.

Field logs of the explorations were prepared by a Terracon field engineer. These logs included visual classifications of the materials encountered during drilling as well as interpretation by our field engineer of the subsurface conditions between samples. Final exploration logs included with this report represent further interpretation by the geotechnical engineer of the field logs and incorporate, where appropriate, modifications based on laboratory classification and testing of the samples.

***In-Situ* Electrical Resistivity Testing:** Two electrical resistivity test, consisting of perpendicular arrays, were performed in general accordance with ASTM G57 using the Wenner Four-Pin Method. Electrode "a" spacings of 5, 10, 20, 30, and 40 feet were used.

Laboratory Testing

Descriptive classifications of the soils indicated on the boring logs are in accordance with the General Notes, the Unified Soil Classification System (USCS), and Description of Rock Properties. USCS symbols are also shown. A brief description of the USCS is attached to this report. Classification was generally by visual/manual procedures, aided by laboratory testing.

Laboratory testing was performed on representative samples of the native sands recovered from our explorations and consisted of the following:

- Two (2) grain size distribution tests (ASTM D422)
- Two (2) moisture content determinations (ASTM D2216)
- Two (2) suite of chemical laboratory tests for corrosivity
    - Conductivity (SM 2510 B Mod.)
    - Chlorides (EPA 300.0)
    - Sulfates (EPA 300.0)
    - pH Analysis (EPA 9045D)

The moisture contents are included on the individual boring logs. The corrosivity test results can be found in the **Corrosivity** section. The grain size distribution tests are presented in the **Exploration Results** section.

SITE LOCATION AND EXPLORATION PLANS

SITE LOCATION and NEARBY GEOTECHNICAL DATA

Proposed Solar Power Facility ▪ Waterford, Connecticut

May 22, 2018 ▪ Terracon Project No. J2185052

Terracon GeoReport

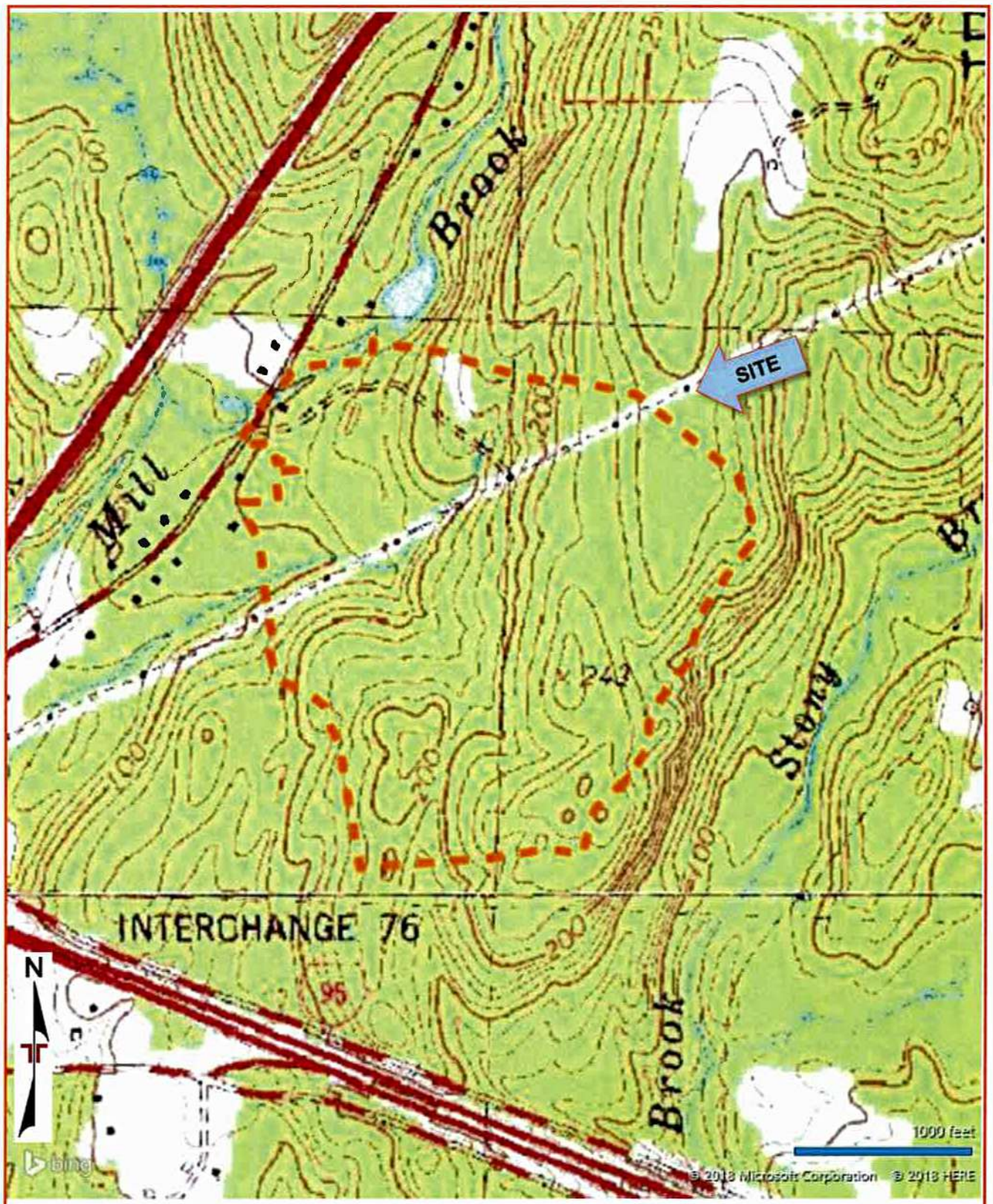


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION PLAN

Proposed Solar Power Facility ▪ Waterford, Connecticut
May 22, 2018 ▪ Terracon Project No. J2185052

Terracon GeoReport

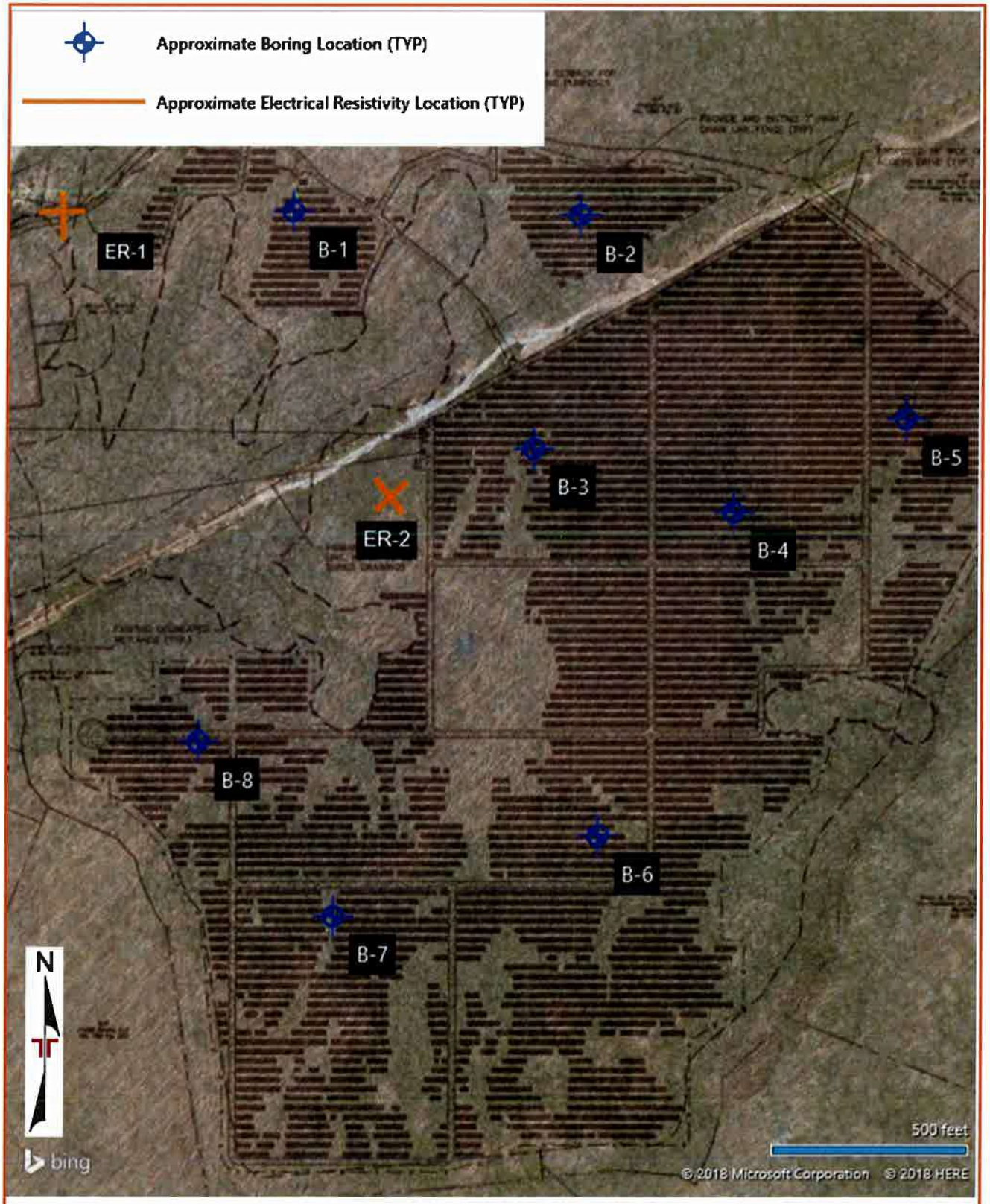


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES MAP PROVIDED BY MICROSOFT BING MAPS
'SITE PLAN' BY BL COMPANIES OF MERIDEN, CONNECTICUT, PROJECT NO. 17D3515, SHEET NO. SP-1, DATED FEBRUARY 28, 2018.

EXPLORATION RESULTS

BORING LOG NO. B-1

PROJECT: Proposed Solar Power Facility

CLIENT: BL Companies
Meriden, Connecticut

SITE: 47-57 Oil Mill Road
Waterford, Connecticut

LOCATION See Exploration Plan

Approximate Surface Elev: 145 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	Description	RECOVERY (In.)	FIELD TEST RESULTS
		FOREST MAT		
1.0	144+/-	**SILTY SAND (SM)**, trace roots, brown, loose, **(SUBSOIL)**	8	1-1-3-4 N=4
2.0	143+/-	**SILTY SAND (SM)**, trace gravel, gray, dense	10	20-17-21-50/2" N=38
3.5	141.5+/-	**COMPLETLEY WEATHERED GRANITIC GNEISS**, gray to white, very dense		
5			2	50/2"
			4	50/4"
10.0	135+/-			
10		***Auger Refusal on Competent Bedrock at 10 Feet***		

GRAPHIC LOG | DEPTH (Ft.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | RECOVERY (In.) | FIELD TEST RESULTS | WATER CONTENT (%)

Stratification lines are approximate. In-situ, the transition may be gradual.
Samples taken with a 2" O.D. split spoon driven by an autohammer.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No free water observed

Terracon
201 Hammer Mill Rd
Rocky Hill, CT

Boring Started: 04-25-2018
Boring Completed: 04-25-2018
Drill Rig: Diedrich D-50
Driller: C.Johnston
Project No.: J2185052

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J2185052 PROPOSED SOLAR PO.GPJ TERRACON_DATATEMPLATE.GDT 5/18/18

BORING LOG NO. B-2

PROJECT: Proposed Solar Power Facility

CLIENT: BL Companies
Meriden, Connecticut

SITE: 47-57 Oil Mill Road
Waterford, Connecticut

LOCATION See Exploration Plan

Approximate Surface Elev: 210 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	Description	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)
		FOREST MAT			
1.5	208.5+/-	**SILTY SAND (SM)**, orange to brown, very loose to medium dense	10	WOH-1-WOH-1 N=1	
3.0	207+/-	**SILTY SAND (SM)**, trace gravel, brown, medium dense to dense	20	5-6-10-14 N=16	
5			15	17-15-17-18 N=32	11
9.0	201+/-		24	18-20-22-20 N=42	
10		**SILTY SAND (SM)**, with gravel, occasional cobbles and boulders, brown, dense to very dense	12	11-12-29-39 N=41	
15			16	12-22-22-50/5" N=44	
20.9	189+/-		10	27-50/5"	

Sampler Refusal on Probable Bedrock at 20.9 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.
Samples taken with a 2" O.D. split spoon driven by an autohammer.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:
WOH - Weight of Hammer

WATER LEVEL OBSERVATIONS

At grade while drilling.

Terracon
201 Hammer Mill Rd
Rocky Hill, CT

Boring Started: 04-25-2018
Boring Completed: 04-25-2018
Drill Rig: Diedrich D-50
Driller: C.Johnston
Project No.: J2185052

THIS BL LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J2185052 PRO: ...D SOLAR PO.GPJ TERRACON_DATATEMPLATE.GDT 5/18/18

BORING LOG NO. B-3

PROJECT: Proposed Solar Power Facility

CLIENT: BL Companies
Meriden, Connecticut

SITE: 47-57 Oil Mill Road
Waterford, Connecticut

LOCATION See Exploration Plan

Approximate Surface Elev: 205 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)
		FOREST MAT						
1.0	204+/-	**SILTY SAND (SM)**, orange to brown, very loose to loose				8	WOH-2-1-1 N =3	
3.0	202+/-	**SILTY SAND (SM)**, trace gravel, occasional cobbles, orange to brown, medium dense to very dense				18	2-3-12-17 N=15	
			5	▽		12	20-20-19-50 N=39	
						1	50/2"	
9.0	196+/-	**SILTY SAND (SM)**, with gravel, brown, dense						
			10			24	13-17-16-18 N=33	
			15			18	14-21-27-28 N=48	
			20			14	10-16-22-23 N=38	
22.0	183+/-	***Boring Terminated at 22 Feet***						

Stratification lines are approximate. In-situ, the transition may be gradual.
Samples taken with a 2" O.D. split spoon driven by an autohammer.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:
WOH = Weight of Hammer

WATER LEVEL OBSERVATIONS

▽ *5 feet while drilling.*

Terracon
201 Hammer Mill Rd
Rocky Hill, CT

Boring Started: 04-25-2018
Boring Completed: 04-25-2018
Drill Rig: Diedrich D-50
Driller: C.Johnston
Project No.: J2185052

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J2185052 PROPOSED SOLAR PO.GPJ TERRACON_DATATEMPLATE.GDT 5/18/18

BORING LOG NO. B-4

PROJECT: Proposed Solar Power Facility

CLIENT: BL Companies
Meriden, Connecticut

SITE: 47-57 Oil Mill Road
Waterford, Connecticut

LOCATION See Exploration Plan

Approximate Surface Elev: 225 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)
		FOREST MAT		▽	X		1-WOH-WOH-2	
2.0	223+/-	**SILTY SAND (SM)**, brown, medium dense			X	18	10-10-15-18 N=25	
4.0	221+/-	**SILTY SAND (SM)**, trace gravel, brown, medium dense	5		X	18	11-13-16-17 N=29	
					X	12	15-15-12-13 N=27	
10.0	215+/-	**SILTY SAND (SM)**, with gravel, occasional cobbles and boulders, brown, very dense	10		X	10	16-38-50/5"	
13.0	212+/-	**COMPLETELY WEATHERED GRANTIC GNEISS**, gray to white						
15.0	210+/-	***Auger Refusal on Competent Bedrock at 15 Feet***	15					

Stratification lines are approximate. In-situ, the transition may be gradual.
Samples taken with a 2" O.D. split spoon driven by an autohammer.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:
WOH = Weight of Hammer

WATER LEVEL OBSERVATIONS

▽ *1 foot while drilling.*

Terracon
201 Hammer Mill Rd
Rocky Hill, CT

Boring Started: 04-25-2018	Boring Completed: 04-25-2018
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	

THIS BC . LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J2185052 PRO- -D SOLAR PO.GPJ TERRACON_DATATEMPLATE.GDT 5/18/18

BORING LOG NO. B-5

PROJECT: Proposed Solar Power Facility

CLIENT: BL Companies
Meriden, Connecticut

SITE: 47-57 Oil Mill Road
Waterford, Connecticut

LOCATION See Exploration Plan

Approximate Surface Elev: 250 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)
		FOREST MAT						
2.0	248+/-	**SILTY SAND (SM)**, orange to brown, loose		▽		18	WOH-1-WOH-1 N=1	
4.0	246+/-	**SILTY SAND (SM)**, trace gravel, brown, very dense				18	2-2-6-11 N=8	14
			5			15	20-21-30-29 N=51	
						24	45-48-42-35 N=90	
10.0	240+/-	**SILTY SAND (SM)**, with gravel, occasonial cobbles and boulders, brown, very dense	10			15	15-23-33-48 N=56	
			15				50/5"	
20.0	230+/-	***Auger Refusal on Probable Bedrock at 20 Feet***	20					

Stratification lines are approximate. In-situ, the transition may be gradual.
Samples taken with a 2" O.D. split spoon driven by an autohammer.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:
WOH = Weight of Hammer

WATER LEVEL OBSERVATIONS

▽ *2 feet while drilling.*

Terracon
201 Hammer Mill Rd
Rocky Hill, CT

Boring Started: 04-26-2018
Boring Completed: 04-26-2018
Drill Rig: Diedrich D-50
Driller: C.Johnston
Project No.: J2185052

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J2185052 PROPOSED SOLAR PO.GPJ TERRACON_DATATEMPLATE.GDT 5/18/18

BORING LOG NO. B-6

PROJECT: Proposed Solar Power Facility

CLIENT: BL Companies
Meriden, Connecticut

SITE: 47-57 Oil Mill Road
Waterford, Connecticut

LOCATION See Exploration Plan

Approximate Surface Elev: 235 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)
		FOREST MAT						
1.5	233.5+/-				X	18	2-1-2-12 N=3	
2.0	233+/-	**SILTY SAND (SM)**, orange to brown, medium dense						
		SILTY SAND (SM), with gravel, occasional cobbles, gray, dense to very dense			X	12	13-16-18-22 N=34	
			5		X	20	11-16-23-24 N=39	
					X	18	27-31-21-35 N=52	
			10		X	18	19-17-21-25 N=38	
			15		X	8	35-50/5"	
19.0	216+/-							
		Auger Refusal on Probable Bedrock at 19 Feet						

Stratification lines are approximate. In-situ, the transition may be gradual.
Samples taken with a 2" O.D. split spoon driven by an autohammer.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No free water observed

Terracon
201 Hammer Mill Rd
Rocky Hill, CT

Boring Started: 04-26-2018	Boring Completed: 04-26-2018
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	

THIS BL LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J2165052 PRO LO SOLAR PO.GPJ TERRACON_DATATEMPLATE.GDT 5/18/18

BORING LOG NO. B-7

PROJECT: Proposed Solar Power Facility

CLIENT: BL Companies
Meriden, Connecticut

SITE: 47-57 Oil Mill Road
Waterford, Connecticut

LOCATION See Exploration Plan

Approximate Surface Elev: 215 (Ft.) +/-

DEPTH	ELEVATION (Ft.)		DEPTH (Ft.)	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		FOREST MAT				
1.5	213.5+/-	**SILTY SAND (SM)**, orange to brown, loose			16	3-2-3-3 N=5
4.0	211+/-	**SILTY SAND (SM)**, trace grave, occasonial cobbles, brown, very dense			24	3-3-5-8 N=8
			5		20	29-41-44-35 N=85
					8	25-50/3"
10.0	205+/-	***Auger Refusal on Probable Bedrock at 10 Feet***	10			

Stratification lines are approximate. In-situ, the transition may be gradual.
Samples taken with a 2" O.D. split spoon driven by an autohammer.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No free water observed

Terracon
201 Hammer Mill Rd
Rocky Hill, CT

Boring Started: 04-26-2018
Boring Completed: 04-26-2018
Drill Rig: Diedrich D-50
Driller: C.Johnston
Project No.: J2185052

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J2185052 PROPOSED SOLAR PO.GPJ TERRACON_DATATEMPLATE.GDT 5/18/18

BORING LOG NO. B-8

PROJECT: Proposed Solar Power Facility

CLIENT: BL Companies
Meriden, Connecticut

SITE: 47-57 Oil Mill Road
Waterford, Connecticut

LOCATION See Exploration Plan

Approximate Surface Elev: 180 (Ft.) +/-

DEPTH	ELEVATION (Ft.)		RECOVERY (In.)	FIELD TEST RESULTS
		FOREST MAT		
1.0	179+/-	**SILTY SAND (SM)**, brown, loose to dense	10	WOH-2-2-2 N=4
			15	13-17-15-16 N=32
5.0	175+/-	**SILTY SAND (SM)**, trace gravel, brown, dense to very dense	18	12-17-17-16 N=34
			14	16-27-25-19 N=52
9.0	171+/-	**SILTY SAND (SM)**, with gravel, occasional cobbles and boulders, gray, very dense	20	16-24-32-40 N=56
			4	50/4"
20.0	160+/-	***Auger Refusal on Probable Bedrock at 20 Feet***		

DEPTH (Ft.): 5, 10, 15, 20

WATER LEVEL OBSERVATIONS: ▽

Stratification lines are approximate. In-situ, the transition may be gradual.
Samples taken with a 2" O.D. split spoon driven by an autohammer.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:
WOH = Weight of Hammer

WATER LEVEL OBSERVATIONS

▽ *13 feet while drilling.*

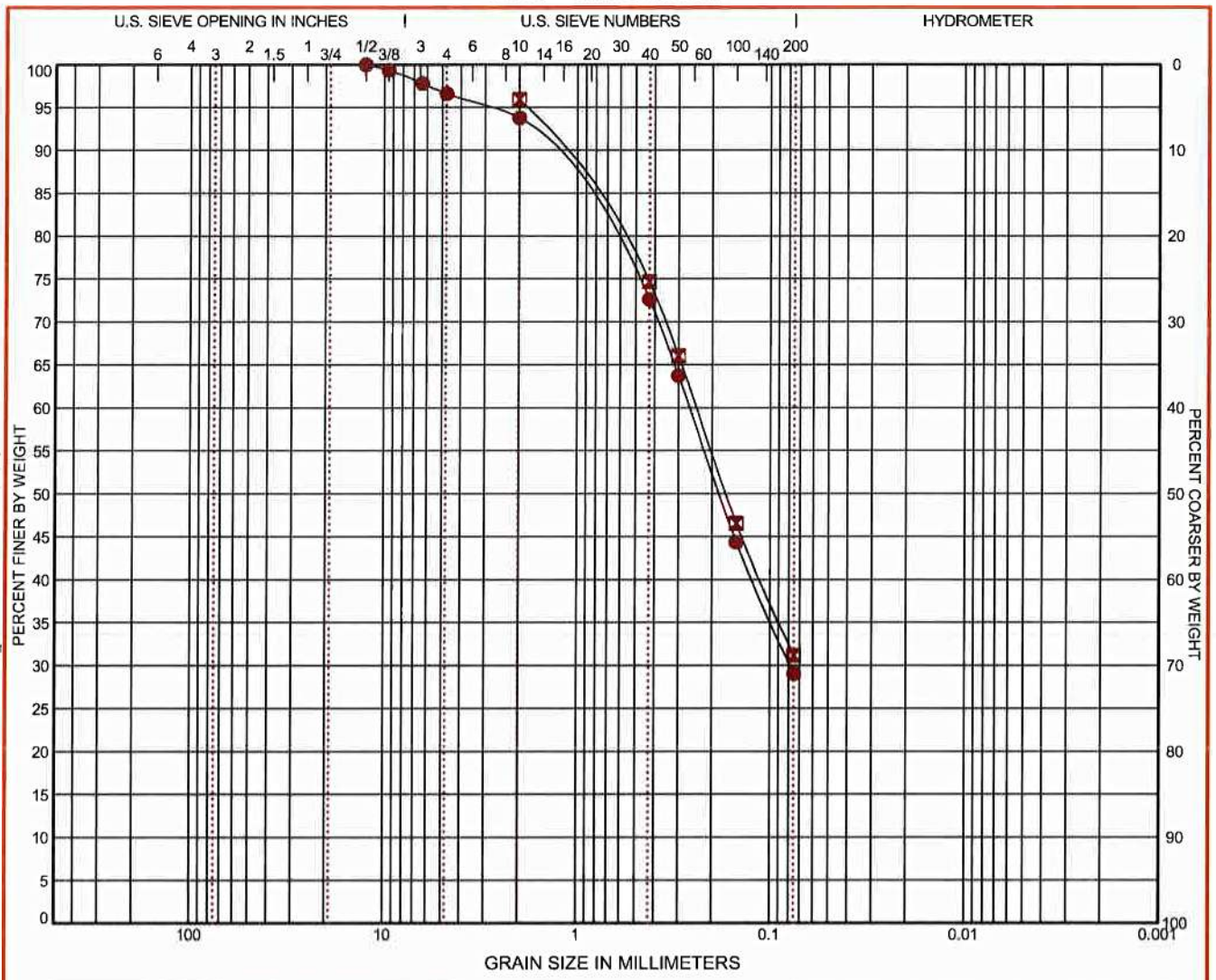
Terracon
201 Hammer Mill Rd
Rocky Hill, CT

Boring Started: 04-26-2018
Boring Completed: 04-26-2018
Drill Rig: Diedrich D-50
Driller: C.Johnston
Project No.: J2185052

THIS BO LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J2185052 PRO: ...D SOLAR PO.GPJ TERRACON_DATATEMPLATE.GDT 5/18/18

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-2	5 - 7	0.0	3.4	67.5		29.1		SM
⊠	B-5	2 - 4			64.8		31.2		SM

GRAIN SIZE	●	⊠	
D_{60}	0.263	0.242	
D_{30}	0.078		
D_{10}			

COEFFICIENTS	●	⊠	
C_C			
C_U			

●	⊠				
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
1/2"	100.0	#10	95.95		
3/8"	99.34	#40	74.67		
1/4"	97.81	#50	66.03		
#4	96.59	#100	46.53		
#10	93.76	#200	31.17		
#40	72.63				
#50	63.73				
#100	44.34				
#200	29.05				

●	SILTY SAND (SM)
⊠	SILTY SAND (SM)

●	Native silty sand
⊠	Native silty sand

PROJECT: Proposed Solar Power Facility

SITE: 47-57 Oil Mill Road
Waterford, Connecticut

Terracon
201 Hammer Mill Rd
Rocky Hill, CT

PROJECT NUMBER: J2185052

CLIENT: BL Companies
Meriden, Connecticut

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 J2185052 PROPOSED SOLAR PO.GPJ TERRACON_DATATEMPLATE.GDT 5/22/18

SUPPORTING INFORMATION

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

Proposed Solar Power Facility ■ Waterford, Connecticut

5/22/2018 ■ Terracon Project No. J2185052

Terracon GeoReport

SAMPLING	WATER LEVEL	FIELD TESTS
⊠ Split Spoon	▽ **Water Initially Encountered** ▽ **Water Level After a Specified Period of Time** ▼ **Water Level After a Specified Period of Time** Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	**N** **Standard Penetration Test Resistance (Blows/Ft.)** **(HP)** **Hand Penetrometer** **(T)** **Torvane** **(DCP)** **Dynamic Cone Penetrometer** **UC** **Unconfined Compressive Strength** **(PID)** **Photo-Ionization Detector** **(OVA)** **Organic Vapor Analyzer**

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (tsf)**	**Standard Penetration or N-Value Blows/Ft.**
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	4 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	8 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	15 - 30
		Hard	> 4.00	> 30

RELATIVE PROPORTIONS OF SAND AND GRAVEL		RELATIVE PROPORTIONS OF FINES	
Descriptive Term(s) of other constituents	Percent of Dry Weight	**Descriptive Term(s) of other constituents**	**Percent of Dry Weight**
Trace	<15	Trace	<5
With	15-29	With	5-12
Modifier	>30	Modifier	>12
GRAIN SIZE TERMINOLOGY		**PLASTICITY DESCRIPTION**	
Major Component of Sample	**Particle Size**	**Term**	**Plasticity Index**
Boulders	Over 12 in. (300 mm)	Non-plastic	0
Cobbles	12 in. to 3 in. (300mm to 75mm)	Low	1 - 10
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)	Medium	11 - 30
Sand	#4 to #200 sieve (4.75mm to 0.075mm	High	> 30
Silt or Clay	Passing #200 sieve (0.075mm)		

UNIFIED SOIL CLASSIFICATION SYSTEM

Proposed Solar Power Facility ■ Waterford, Connecticut

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Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or $1 > Cc > 3$ [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F, G, H]
			Fines classify as CL or CH		GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or $1 > Cc > 3$ [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G, H, I]
			Fines classify as CL or CH		SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A"		CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K, L, M]
		Organic:	Liquid limit - oven dried / Liquid limit - not dried	< 0.75	OL	Organic clay [K, L, M, N]
						Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K, L, M]
			PI plots below "A" line		MH	Elastic Silt [K, L, M]
		Organic:	Liquid limit - oven dried / Liquid limit - not dried	< 0.75	OH	Organic clay [K, L, M, P]
						Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

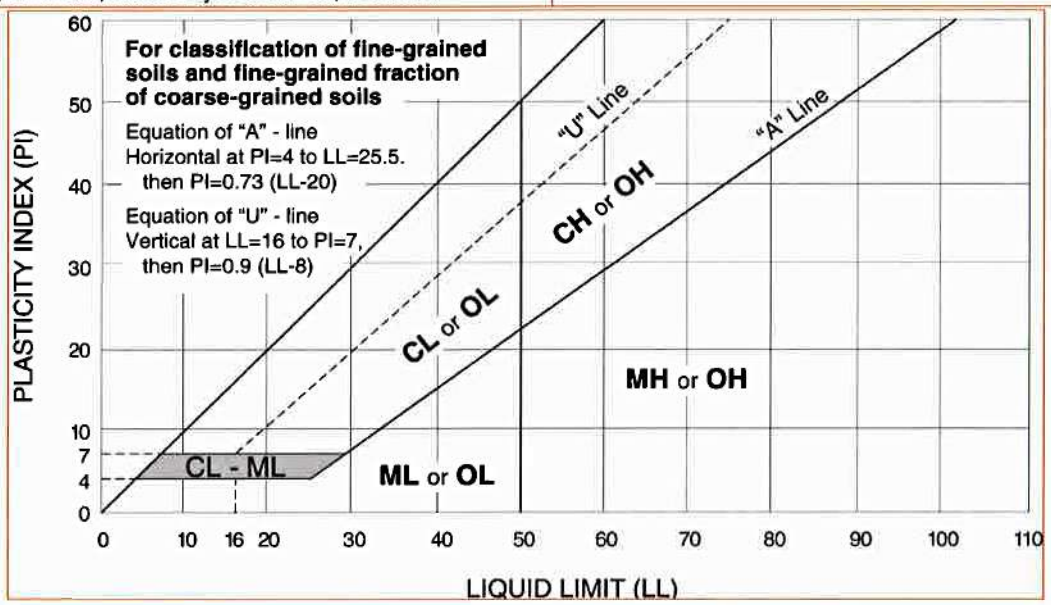
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



DESCRIPTION OF ROCK PROPERTIES

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WEATHERING	
Term	**Description**
Unweathered	No visible sign of rock material weathering, perhaps slight discoloration on major discontinuity surfaces.
Slightly weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than in its fresh condition.
Moderately weathered	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a continuous framework or as corestones.
Highly weathered	More than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones.
Completely weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.
Residual soil	All rock material is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported.

STRENGTH OR HARDNESS		
Description	**Field Identification**	**Uniaxial Compressive Strength, psi (MPa)**
Extremely weak	Indented by thumbnail	40-150 (0.3-1)
Very weak	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife	150-700 (1-5)
Weak rock	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer	700-4,000 (5-30)
Medium strong	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with single firm blow of geological hammer	4,000-7,000 (30-50)
Strong rock	Specimen requires more than one blow of geological hammer to fracture it	7,000-15,000 (50-100)
Very strong	Specimen requires many blows of geological hammer to fracture it	15,000-36,000 (100-250)
Extremely strong	Specimen can only be chipped with geological hammer	>36,000 (>250)

DISCONTINUITY DESCRIPTION			
Fracture Spacing (Joints, Faults, Other Fractures)		**Bedding Spacing (May Include Foliation or Banding)**	
Description	**Spacing**	**Description**	**Spacing**
Extremely close	< ¾ in (<19 mm)	**Laminated**	< ½ in (<12 mm)
Very close	¾ in – 2-1/2 in (19 - 60 mm)	**Very thin**	½ in – 2 in (12 – 50 mm)
Close	2-1/2 in – 8 in (60 – 200 mm)	**Thin**	2 in – 1 ft. (50 – 300 mm)
Moderate	8 in – 2 ft. (200 – 600 mm)	**Medium**	1 ft. – 3 ft. (300 – 900 mm)
Wide	2 ft. – 6 ft. (600 mm – 2.0 m)	**Thick**	3 ft. – 10 ft. (900 mm – 3 m)
Very Wide	6 ft. – 20 ft. (2.0 – 6 m)	**Massive**	> 10 ft. (3 m)

Discontinuity Orientation (Angle): Measure the angle of discontinuity relative to a plane perpendicular to the longitudinal axis of the core. (For most cases, the core axis is vertical; therefore, the plane perpendicular to the core axis is horizontal.) For example, a horizontal bedding plane would have a 0-degree angle.

ROCK QUALITY DESIGNATION (RQD) [1]	
Description	**RQD Value (%)**
Very Poor	0 - 25
Poor	25 – 50
Fair	50 – 75
Good	75 – 90
Excellent	90 - 100

1. The combined length of all sound and intact core segments equal to or greater than 4 inches in length, expressed as a percentage of the total core run length.

Reference: U.S. Department of Transportation, Federal Highway Administration, Publication No FHWA-NHI-10-034, December 2009 Technical Manual for Design and Construction of Road Tunnels – Civil Elements