



November 9, 2015  
File No. 89320.12

Mr. Paul Gildersleeve  
Solid Waste Bureau  
New Hampshire Department of Environmental Services  
29 Hazen drive, P.O. Box 95  
Concord, New Hampshire 03302-0095

**Re: Lowell Road Solar, LLC  
LL&S, Inc. Construction and Demolition Debris Landfill  
Salem, New Hampshire  
Type I-B Modification for Solar Panel Array  
DES-SW-TP-94-030**

Dear Mr. Gildersleeve:

On behalf of Lowell Road Solar and LL&S, Inc., Nobis Engineering, Inc. (Nobis) is resubmitting the enclosed Type I-B Modification for a solar panel array installation on the LL&S, Inc. Construction and Demolition Debris Landfill. Please find enclosed, one copy of the revised application for your review. Please apply the \$100 fee received by the New Hampshire Department of Environmental Services (NHDES) with the original submittal of this application. The package attached to this cover is to replace the application formerly submitted to NHDES.

In addition to the application, the design drawings and supporting calculations are included under this cover.

Please do not hesitate to contact us with any questions at (603) 724-6236.

Sincerely,

NOBIS ENGINEERING, INC.

A handwritten signature in black ink, appearing to read "J. Christopher Adams".

J. Christopher Adams, P.E.  
Director of Civil Engineering

Attachment: Type I-B Modification Application and Supporting documents  
Type I-B Permit Modification Fee

cc: File No. 89320.16 (w/attach.)

**INSTRUCTIONS  
for obtaining a**

# Type I Modification To Solid Waste Management Facility Permit

pursuant to  
RSA 149-M and New Hampshire Administrative Solid Waste Rule Env-Sw 315

Read these instructions before completing the attached form. For additional assistance contact the NH Department of Environmental Services (DES), Permitting & Design Review Section (P&DRS) at (603) 271-2925 or the below noted mailing address or TDD Access: Relay NH 1-800-735-2964.

**Note:** All references on this form beginning with "Env-Sw" are citations from the New Hampshire Solid Waste Rules. To obtain a copy of the Rules, contact the DES Public Information & Permitting Office at (603) 271-2975 or above noted TDD Access. The Rules are also available on the Internet at <http://www.des.nh.gov/rules>.

Complete the attached form to obtain either a "type I-A" or "type I-B" permit modification pursuant to Env-Sw 315.02(b) or (c), respectively. **Before completing the form, be certain the proposed facility modification falls within the definition of either a type I-A or type I-B modification.** [If unfamiliar with how to make this determination, refer to the worksheet on the reverse side of this instruction sheet and/or contact the P&DRS for assistance.]

All requested information must be provided as specified. Do **NOT** skip any question, unless instructed to do so. Do **NOT** mark any question "not applicable." If you need more room than provided on the form to answer a particular question and are using a paper copy of the form, attach additional pages as necessary; mark each page clearly to show both the applicant name and the question being answered; and indicate on the form that the additional pages are attached.

Submit **THREE** copies of the completed form, **EACH bearing ORIGINAL signatures**. Applications may be submitted to the department electronically. If an applicant chooses to submit an application electronically, a single paper copy of the application shall also be submitted to the department to the following address:

**NH Department of Environmental Services (DES)  
Waste Management Division (WMD)  
Permitting & Design Review Section (P&DRS)  
29 Hazen Drive, PO Box 95  
Concord, NH 03302-0095**

Include the required fee, as determined from the following table. Make checks or money orders payable to "TREASURER, State of New Hampshire":

<b>Type I-A Modification, without a capacity increase</b>	<b>\$1500</b>
<b>Type I-A Modification, with a capacity increase</b>	<b>See Env-Sw 310.07(a)(2) for formula to calculate or contact the P&amp;DRS for assistance, at (603) 271-2925</b>
<b>Type I-B Modification</b>	<b>\$100</b>

Your application will be processed by DES in accordance with Env-Sw 304 and Env-Sw 305. If your application is correctly filed (i.e., you submit the right number of copies, each with original signatures, and the required fee), your application will be accepted for processing. Within 60 days of receipt, and earlier whenever possible, you will be notified whether the application is complete (i.e., whether the application provides all information required to support a full technical review and determine whether the proposed modification meets all requirements of the Rules). If incomplete, you will be given instructions for correcting the deficiencies. If complete, you will be notified in writing and the agency will undertake a technical review of the application to determine whether the proposal meets all requirements of the Rules. In addition, for certain type I-A modifications, the agency must also hold a public hearing within the host municipality during the technical review process. Following the close of the technical review process and the hearing, if held, DES will make a final decision to issue or deny the requested modification. You will be notified in writing, as will the host municipality and host solid waste management district.

**WORKSHEET FOR DETERMINING MODIFICATION TYPE**

**STEP 1:** In order to correctly use and complete the attached application form, you must first confirm that your proposed facility modification is a "type I" modification (as opposed to being either a "type II" through "type V" modification). If your response to each of the following questions is "FALSE," your proposed facility modification most likely falls within the scope of a "type I" modification:

True  False The proposed change is required by a condition of my permit which requires me to submit final plans for DES approval based on preliminary plans provided to DES on an earlier date. (Note: If this statement is "TRUE," your proposed modification is most likely a "type II" modification and you need to file your application by completing a "Type II Permit Modification Application Form.")

True  False The proposed change is one of the following **AND** I am able to certify compliance with each of the statements provided in Section X of this application form:

— A change in facility operating hours between the hours of 6 AM and 6 PM or within alternative limits specified in my permit, or for a private facility managing only on-site generated waste, within limits allowed by local ordinance.

— A change in a key above-ground site feature, for instance a facility structure or appurtenance, which will not alter the permitted function(s) of the facility, change the basis of the approved facility design or violate any applicable siting criteria specified in the Rules, and which is merely a change to improve facility operations within the limits specified in my permit.

— For a facility permitted to collect recyclable materials, a change in the type of select recyclable materials (paper, cardboard, glass, plastic, metal or textiles) to be collected which does not increase the facility's approved storage capacity or require a change in the approved financial assurance plan of record for the facility.

— For landfills, a change in the type of cover material to be used at the facility, pursuant to Env-Sw 806.03.

— A name change for the permittee or facility that does not constitute a change in ownership or operational control of the facility.

— A change in organizational structure, including a change in the individuals/entities holding 10% or more of the permittee's equity or debt and/or a change in officers, directors, partners or key employees, that does not constitute a change in ownership or operational control of the facility.

(Note: If you respond "TRUE" to the above statement, your proposed modification is most likely a "type III" modification and you need to file your application by completing a "Type III Permit Modification Application Form.")

True  False The proposed change is to transfer my permit or otherwise authorize a change in the ownership or operational control of the facility. (Note: If you respond "TRUE" to this statement, your proposed modification is most likely a "type IV" modification and you need to file your application by completing a "Type IV Permit Modification Application Form.")

True  False The proposed change is to authorize the destruction or relocation of facility records. (Note: If you respond "TRUE" to this statement, your proposed modification is most likely a "type V" modification and you need to file your application by completing a "Type V Permit Modification Application Form.")

**STEP 2:** If your response to each of the above is "FALSE," you may assume that the proposed modification is a type I modification. You must now determine whether the proposed change is a "type I-A" or "type I-B" modification, as defined by Env-Sw 315.02(b) or (c).

A "type I-A" modification is one that will change facility operations in a manner having the potential to adversely affect the state's ability to establish and maintain an integrated system of facilities which: (1) will assist in achieving the waste reduction/recycling goals in RSA 149-M:2; (2) is consistent with the hierarchy in RSA 149-M:3; and (3) will provide a substantial public benefit pursuant to RSA 149-M:11. Therefore, if any of the following statements are TRUE relative to the change you are proposing at your facility, the change falls within the definition of a "type I-A" modification.

True  False The proposed modification will increase the approved design capacity of the facility.

True  False The proposed modification will extend the expiration date of the permit.

True  False The proposed modification will reduce the operating life expectancy of a NH landfill without a comparable reduction in the permitted capacity of the landfill, as by directly or indirectly increasing the quantity of waste which will be received daily at a New Hampshire landfill.

True  False The proposed modification will expand the permitted service area of the subject facility.

True  False The proposed modification will change the subject facility service type from a "limited service" area facility (one which can accept waste from only certain sources specified in the permit) to an "unlimited service" area facility (one which can accept waste from any source).

True  False The proposed modification will change facility operations to include a waste management method less preferred in the RSA 149-M:3 hierarchy. The methods, in order of descending preference as specified in RSA 149-M:3 are: source reduction; recycling and reuse; composting; waste-to-energy technologies (including incineration); incineration without resource recovery; and landfilling.

If you answer "FALSE" to each of the above statements, your proposed modification is most likely a "type I-B" modification, i.e., a modification which is unlikely to have an adverse effect on the state's ability to establish and maintain an integrated system of facilities which (1) will assist in achieving the waste reduction/recycling goals in RSA 149-M:2; (2) is consistent with the hierarchy in RSA 149-M:3; and (3) provides a substantial public benefit pursuant to RSA 149-M:11.



Waste Management Division

<b>For Office Use Only:</b>	
WMD Log #:	_____
Date Rec'd.:	_____
No. of Copies:	_____
Fee: \$	_____ / Check # _____

## APPLICATION FORM FOR TYPE I MODIFICATION TO SOLID WASTE MANAGEMENT FACILITY PERMIT

pursuant to  
RSA 149-M and New Hampshire Administrative Solid Waste Rule Env-Sw 315

### SECTION I. FACILITY IDENTIFICATION

(1)	Facility name: LL&S, Inc. Construction and Demolition Debris Landfill
(2)	Functional classification: <input type="checkbox"/> collection/storage/transfer <input type="checkbox"/> processing/treatment <input checked="" type="checkbox"/> landfill
(3)	Mailing address: 87 Lowell Road, Salem, New Hampshire 03079
(4)	Permit number: DES-SW-TP-94-030
(5)	Location, by street address and municipality: 87 Lowell Road, Salem, New Hampshire 03079

### SECTION II. PERMITTEE IDENTIFICATION

(1)	Permittee/applicant name: LL&S, Inc.		
(2)	Mailing address: 89 Lowell Road Salem, New Hampshire 03079		
(3)	Telephone number: 603-679-2626		
(4)	If different than above, identify the individual associated with and designated by the permittee/applicant to be the contact individual for matters concerning this application:		
	(a) Name: David Devito	(b) Title: General Manager	
	(c) Mailing address: 89 Lowell Road Salem, New Hampshire 03079		
	(d) Telephone number: 603-679-2626	(e) E-Mail: ddevito@reenergyholdings.com	

### SECTION III. DESCRIPTION OF PROPOSED MODIFICATION

Describe the proposed modification by answering each of the following questions. Use additional paper as necessary.

(1)	Provide a <b>BRIEF</b> description of the proposed modification. [Check box if response is provided on separate paper <input checked="" type="checkbox"/>		
(2)	Identify whether the proposed modification is a "type I-A" or "type I-B" modification. (If uncertain, use the worksheet provided with the instructions for this form): <input type="checkbox"/> Type I-A <input checked="" type="checkbox"/> Type I-B		
(3)	Identify, either below or on separate paper, each written permit condition that will require amendment to effect the proposed modification and provide draft language for the same. [Check box if response is provided on separate paper <input type="checkbox"/>		
(4)	Identify, below, each "last approved plan of record" identified in the permit which will be affected by the proposed modification and will therefore require amendment/revision:		
	<b>Check here if affected</b>	<b>TYPE OF PLAN</b>	<b>DES APPROVAL DATE</b>
	<input type="checkbox"/>	Facility design plans/specifications	
	<input type="checkbox"/>	Facility operating plan	
	<input checked="" type="checkbox"/>	Facility closure plan	July 11, 1994
	<input type="checkbox"/>	Facility financial assurance plan	
	<input type="checkbox"/>	Other plan (specify):	
			<b>WMD LOG #</b> (Find this number on your copy of the approval)
			WMD 168-94 & WMD 618-94

(5)	Submit, on separate paper, the proposed amendments/revisions for each document identified pursuant to (4) above, based on the below listed instructions. (Note: The revisions may be presented in the form of replacement pages ready for substitution into the last approved plan of record, each page being clearly marked to show the date of revision. In the event there is no last approved plan of record for any of the following, you must prepare and submit a full plan, including the proposed modification(s), in accordance with the applicable cited Rules.)	
	<input checked="" type="checkbox"/>	Facility design plans must be prepared in accordance with Env-Sw 1103.05.
	<input type="checkbox"/>	Facility operating plans must be prepared in accordance with Env-Sw 1105.11.
	<input type="checkbox"/>	Facility closure plans must be prepared in accordance with Env-Sw 1106.04.
	<input type="checkbox"/>	Financial assurance plans must be prepared as specified in Env-Sw 1400 and must include all related draft financial assurance documents required to effect the proposed modification.
(6)	In order for DES to approve the proposed modification, the agency must be able to conclude from the information provided in this application that the proposed modification meets all applicable requirements of the Rules. Therefore, for any aspect of the proposed modification where it may not be self-evident that the proposed change meets all applicable requirements of the Rules, you should explicitly provide such information. Provide your response below and/or use separate paper as necessary. (Check box if response is attached on separate paper <input type="checkbox"/> )	

**SECTION IV. SCHEDULE**

Provide a proposed schedule for implementing the modification. Use separate paper if necessary. (Check box if response is attached on separate paper )

2016 Construction

**SECTION V. STATEMENT OF NEED**

Provide a statement of need describing why the proposed change is necessary or desirable. Use separate paper if necessary. (Check box if response is attached on separate paper )

Generation of electricity on the landfill cover using a solar photovoltaic panel array.

**SECTION VI. IMPACT EVALUATION**

On separate paper, identify all impacts, both positive and adverse, which the proposed modification will have, including each of the below listed considerations.

- (1) The effect the modification will have on facility function, capacity, life expectancy, service type and service area.
- (2) The effect the modification will have on the environment, public health and safety.
- (3) The effect the modification will have on the state's ability to achieve the goals and objectives specified in RSA 149-M:2, namely achieving a 40% minimum weight reduction in the solid waste stream on a per capita basis by the year 2000 and avoiding the disposal of recyclable materials in a lined landfill with a leachate collection system.
- (4) The effect the modification will have on establishing and maintaining integrated waste management systems consistent with the hierarchy of waste management methods in RSA 149-M:3 [the methods, in descending order of preference as specified in RSA 149-M:3, are: source reduction; recycling and reusing; composting; waste-to-energy technologies (including incineration), incineration without resource recovery; and landfilling].
- (5) Consistency with the state solid waste management plan and the applicable district plan, pursuant to RSA 149-M:12,I(b). If necessary, contact the P&DRS at (603) 271-2925 for plan information.

**SECTION VII. PUBLIC BENEFIT DEMONSTRATION**

Provide a "demonstration of public benefit" based on the below listed instructions. Check which one of the listed instructions applies to your particular application.

- |                                     |   |
|-------------------------------------|---|
| <input type="checkbox"/>            | For a type I-A modification of a standard permit, provide a "demonstration of public benefit" in accordance with RSA 149-M:11 and in conformance with the provisions of Env-Sw 1005.05. Prepare and submit the demonstration on separate paper.   |
| <input type="checkbox"/>            | For a type I-A modification of an emergency permit or a research and development permit, or a permit-by-notification, there is a presumption of public benefit, provided that the proposed modification meets all requirements of the Rules. Therefore, you may skip this section and go to Section VIII. |
| <input checked="" type="checkbox"/> | For a type I-B modification, there is a presumption of public benefit, provided that the proposed modification meets all requirements of the Rules. Therefore, you may skip this section and go to Section VIII.  |

**SECTION VIII. OTHER PERMITS**

Complete the following table to identify and provide the status of all other permits or approvals necessary to effect the proposed modification.

Type of Permit/Approval Required	Date the Application was/will be Submitted	Status/Comments

**SECTION IX. LEGAL NOTICES**

Submit proof of having provided certain legal notifications and filings, as follows:

- (1) You must send by certified mail, or deliver in hand, a complete copy of this application to the host municipality, host solid waste management district and other affected entities, with a "notice of filing," as specified by Env-Sw 303.
- (2) For a type I-A modification, you must send by certified mail, or deliver in hand, a "notice of filing" to each owner of property abutting the facility site, as specified by Env-Sw 303. If the applicant/permittee or the owner of the facility site owns any abutting parcel of land, the "notice of filing" must be sent to the owner(s) of the next parcel(s) not owned by the permittee/applicant or facility site owner.
- (3) You must also provide a "notice of filing" to the New Hampshire Department of Justice/Office of the Attorney General (NH DoJ/AGO) if, pursuant to Section X(2) of this form, you are required to submit business and personal disclosure information.
- (4) You must attach to this application "proof" that notification has been provided as required by (1) through (3) above. Therefore, attach a copy of the notice(s) of filing and the signature(s) of all required recipients, acknowledging receipt.

**SECTION X. CERTIFICATION OF COMPLIANCE/COMPLIANCE REPORT**

All applications for permit modification must be submitted with either certification of compliance or a compliance report, as follows:

- (1) If you are ABLE to certify that each of the statements numbered (1) - (8) below are true, do so by your signature.
- (2) If you are UNABLE to certify that each of the statements numbered (1) - (8) below are true, you must:
  - Prepare and submit a separate Compliance Report as specified by Env-Sw 303.15; and
  - If the proposed modification involves a change in organizational structure, or a change in individuals/entities holding 10% or more of the permittee's debt or equity, or a change in officers, directors, partners or key employees, none of which constitutes a change in operational control of the facility or a change in ownership per Env-Sw 315.02(f), also submit completed "business and personal disclosure forms" for each non-compliant individual and entity involved in the change. Obtain the required forms from the P&DRS at (603) 271-2925. Submit the completed forms, with the notice of filing referenced by Section IX(3) of this form and a copy of the Compliance Report, direct to the New Hampshire Department of Justice/Office of Attorney General, Environmental Protection Bureau, 33 Capitol Street, Concord, NH 03301-6397. [Note: Copies of the completed disclosure forms should NOT be attached to this application when it is submitted to DES or to the host municipality, host solid waste management district and other effected entities, pursuant to Section IX(1) above. Only the NH DoJ/AGO should receive copies of the disclosure forms].

**COMPLIANCE STATEMENT**

The applicant shall certify that each of the statements listed in (1)-(8) below are true for each of the following individuals and entities:

- The applicant, and
- The facility owner, and
- The facility operator, and
- All individuals and entities holding 10% or more of the applicant's debt or equity, and
- All of the applicant's officers, directors, and partners, and
- All individuals and entities having managerial, supervisory or substantial decision making authority and responsibility for the management of the facility operations or the activity(s) for which approval is being sought.

(1)	No individual or entity listed above has been convicted of or plead guilty or no contest to a felony in any state or federal court during the 5 years before the date of the application.
(2)	No individual or entity listed above has been convicted of or plead guilty or no contest to a misdemeanor for a violation of environmental statutes or rules in any state or federal court during the 5 years before the date of the application.
(3)	No individual or entity listed above has owned or operated any hazardous or solid waste facility which has been the subject of an administrative or judicial enforcement action for a violation of environmental statutes or rules during the 5 years before the date of the application.

- (4) No individual or entity listed above has been the subject of any administrative or judicial enforcement action for a violation of environmental statutes and rules during the 5 years before the date of the application;
- (5) All hazardous and solid waste facilities owned or operated in New Hampshire by any individual or entity listed above are in compliance with either.
  - (a) All applicable environmental statutes, rules, and DES permit requirements; or
  - (b) A DES approved schedule for achieving compliance therewith.
- (6) All individuals and entities listed above are in compliance with all civil and criminal penalty provisions of any outstanding consent agreement, settlement, or court order to which DES is a party.
- (7) All individuals and entities listed above have paid, or are in compliance with the payment schedule for any administrative fine assessed by DES.
- (8) All individuals and entities listed above are in compliance with all terms and conditions under every administrative order, court order or settlement agreement relating to programs implemented by DES.

Signature of the permittee/applicant certifying the above statements are true:

Permittee/Applicant Name (Print Clearly or Type) Greg Leahey

Permittee/Applicant Signature *Gregory M Leahey*

Date 11/6/15

**SECTION XI. PERMITTEE/APPLICANT SIGNATURE REQUIREMENTS**

The permittee/applicant must sign the following statement prior to submitting this application. All copies of the application filed with DES must bear the permittee's/applicant's ORIGINAL signature. If the permittee/applicant is not an individual, an individual duly authorized by the permittee/applicant shall sign the application.

To the best of my knowledge and belief, the information and material submitted herewith is correct and complete. I understand that any approval granted by DES based on false and/or incomplete information shall be subject to revocation or suspension, and that administrative, civil or criminal penalties may also apply. I certify that this application is submitted on a complete and accurate form, as provided by DES, without alteration of the text.

Permittee/Applicant Name (Print Clearly or Type) Greg Leahey

Permittee/Applicant Signature *Gregory M Leahey*

Date 11/6/15

**SECTION XII. PROPERTY OWNER SIGNATURE**

If the permittee and property owner are not the same, the property owner must also sign this form as follows. All copies of the application filed with DES must bear the property owner's ORIGINAL signature. If the property owner is not an individual, an individual duly authorized by the property owner shall sign the application.

(1) I hereby affirm that the permittee/applicant has the legal right to occupy and use the property on which the subject facility is or will be located for the purposes specified in this application.

(2) I hereby affirm that I shall grant access to the property for closure and post-closure monitoring of the subject facility and site as required by RSA 149-M and the New Hampshire Solid Waste Rules (Env-Sw 100 - 300 and Env-Sw 400 - 2000), as amended.

Property Owner Name (Print Clearly or Type) Gregory M Leahey

Property Owner Signature *Gregory M Leahey*

Date 11/6/15



**Photovoltaic Solar Array  
LL&S, Inc. Construction and Demolition Debris Landfill  
Facility Permit Number: DES-SW-TP-94-030**

**Solid Waste Management Facility Permit  
Type I-B Modification for Solar Panel Array Installation**

**Prepared By:  
Nobis Engineering, Inc.  
18 Chenell Drive  
Concord, New Hampshire 03301**

**Prepared For:  
Lowell Road Solar, LLC  
22 Rosemary Lane  
Durham, New Hampshire 03824**

**Facility Owner:  
LL&S, Inc.  
87 Lowell Road  
Salem, New Hampshire 03079**

**October 13, 2015**



### **SECTION III (1) Brief Description of Proposed Modification**

This Type I-B permit modification is submitted to construct a solar array on the closed landfill at the LL&S, Inc. Construction and Demolition Debris Landfill in Salem, New Hampshire. The project involves the installation of 4,180 photovoltaic panels that would generate 1,316.7 kilowatts (KW) of electricity. Supporting information including the array drawings and calculations in accordance with Env-SW 1103.5 are included in Part II of the application.

#### **Solar Array Layout**

The solar panel array is shown on the attached design drawings and consists of 32 rows along the top of the landfill or the flatter portion of the cap system. Each row is made up of a varying number of panels based on the most efficient configuration. The panels have been located to achieve maximum performance while avoiding steep slopes of the soil cap system.

#### **Facility Access**

The landfill is located adjacent to an active construction and demolition debris processing facility and is located within a 5-ft high chain link fence bordering the entire facility. Access to the landfill is via the facility driveway that runs along the toe of the landfill cap system and doubles as access to the active processing facility. Access to the facility driveway is controlled via a gate.

The site is surrounded by a natural barrier of woodlands which screens the site from direct view from private residences and from Lowell Road.

#### **Array Construction**

The construction of the array is detailed in the attached design drawings as prepared by Nobis Engineering, Inc. (Nobis), American Capital Energy (ACE), and the Solar Racking Company, GameChange Racking (GCR). The construction will be conducted in accordance with the construction requirements in Env-Sw 1104 and involves the installation of a pour in-place foundation system that rests on a crushed stone bed on top of the existing grass layer so the existing cap is not impacted. The foundation is constructed using a molded plastic form that is filled with concrete using skid steer equipment and racking beams that the solar panels are eventually attached to. The foundations are spaced in accordance with snow, wind, and cap load structural requirements as designed by GCR.

Once the solar panels are mounted to the racking system, electrical conduits are installed and the panels are wired. All electrical conduit systems meeting local and national electrical codes are installed above grade and are mounted to the racking systems. The array will be connected to an existing Liberty Utilities Pole and transformer located off of the landfill cap and adjacent to the landfill at the existing facility.

#### **Impacts to Capping System**

The existing landfill cap system generally consists of a soil cap consisting of a layer of 6-inches



of final cover over the demolition debris overlain by an 18 inch thick clay glacial cap overlain by a 6 inch protective cover of topsoil or material with sufficient organic matter to support vegetation as documented in the Hoyle, Tanner & Associates (HTA) Closure Plan dated April 14, 1994. The soil cap serves as an impermeable barrier which greatly reduces surface water infiltration into the underlying debris. Any damage to the cap or wear of the vegetative layer that occurs during construction activities will be promptly repaired in like kind.

According to the HTA Closure Plan Addendum No.1, dated May 23, 1994, the existing cap materials and depths vary based on an existing firebreak that has been shown on the attached design drawings. The area north of the firebreak consists of approximately 152,500 square feet (SF) or 3.5 acres and is capped with a silty sand overlain by loam. The depth of the landfill cap over the north section ranges from 1.83 feet to 4.50 feet with an average depth of 3.13 feet. The area south of the firebreak consists of approximately 550,823 SF or 12.6 acres and is capped with glacial till overlain by loam. The depth of the landfill cap over the south section ranges from 0.67 feet to 12.75 feet with an average depth of 3.5 feet.

The solar panels and foundation systems are light and add only a nominal dead weight to the cap. Settlement of the cap under the weight of the panel array would be minor. If minor settlement is experienced, it is expected to be uniform and without large differential settlements that could impact the integrity of the cap. Being that the cap is strictly a soil cap and is not constructed with geosynthetics, impacts from the weight of wheel loads or track pressures of construction equipment is not a concern.

The supporting calculations prepared by GCR show that the solar array will be stable even under the most critical loading condition of hurricane level winds. In addition, overturning and sliding were analyzed and found to be stable.

### **Maintenance and Decommissioning**

Lowell Road Solar, LLC will be responsible for annual maintenance of the panels and the areas around the panels. Maintenance will consist of mowing the grass at least 2-3 times a year and cleaning the panels as needed once a year. Areas outside of the array will continue to be maintained by LL&S, Inc. Snow removal will include snow blowing a clean row at the base of the panels so the snow can shed off and not back up onto the panels affecting production in the winter months.

At the end of the solar contract, the Lowell Road Solar, LLC of the array is legally responsible to remove all equipment and ballast blocks including the crushed stone so as to restore the landfill cap to its original state and LL&S, Inc. can continue mowing operations of the entire cap.



## SECTION VI Impact Evaluation

As required by the Type I-B application document, the following responses are provided to the five considerations:

- (1) The effect the modification will have on the facility function, capacity, life expectancy, service type, and service area.**

The modification request as proposed will not change the facility function, capacity, life expectancy, service type, or service area.

- (2) The effect the modification will have on the environment, public health and safety.**

The modification will have no effect on the environment, public health, and public safety.

- (3) The effect the modification will have on the state's ability to achieve the goals and objectives specified in RSA 149-M:2, namely achieving a 40% minimum weight reduction in the solid waste stream on a per capita basis by the year 2000 and avoiding the disposal of recyclable materials in a lined landfill with a leachate collection system.**

The modification will not affect the state's ability to achieve the goals and objectives specified in RSA 149-M:2.

- (4) The effect the modification will have on establishing and maintaining integrated waste management systems consistent with the hierarchy of waste management methods in RSA 149-M:3 [the methods, in descending order of preference as specified in RSA 149-M:3, are: source reduction; recycling and reusing; composting; waste-to-energy technologies (including incineration), incineration without resource recovery; and landfilling].**

The modification does not impact establishing and maintaining integrated solid waste management systems consistent with the hierarchy of waste management methods in RSA 149-M:3.

- (5) Consistency with the state solid waste management plan and the applicable district plan, pursuant to RSA 149-M:12, I (b). If necessary, contact the P&DRS at (603) 271-2925 for plan information.**

The modification does not impact the state solid waste management plan and the applicable district plan pursuant to RSA 149-M:12 I(b).



**PART II Design Drawings and Supporting Calculations**

See attached.



**Calculation Package for GameChange Racking  
Pour-in-Place Ground Ballast System**

**Project:** Salem NH  
**Address:** Salem NH  
**Update:** 10/7/2015      **By:** GF

**General Information:**

<b>PIP</b>	1UP	
<b>Setup</b>	Continuous	
<b>Tilt</b>	25	degree
<b>Clearance</b>	24	in
<b>Loading Code</b>	ASCE7-10	
<b>Risk Category</b>	I	
<b>Exposure Category</b>	C	
<b>Site Class</b>	D	
<b>Load Bearing Capacity of Soil</b>	1	ksf
<b>Dead Load</b>	3	psf
<b>Ground Snow Load (Pg)</b>	50	psf
<b>Basic Wind Speed</b>	111	mph
<b>Panel Length</b>	77	in
<b>Panel Width</b>	39	in
<b>Interior</b>		
Panels Supported per Tub (mid)	5.00	
Panels Supported per Tub (edge)	3.50	
<b>Exterior</b>		
Panels Supported per Tub (mid)	4.00	
Panels Supported per Tub (edge)	2.50	

## 1. Loading Calculations

### 1.1 Snow Load

$P_g$ (psf)	50.00
$C_e$	0.90
$C_t$	1.20
$I_s$	0.80
$C_s$	0.82

$$P_s = C_s * P_g = 22.43 \text{ psf}$$

### 1.2 Wind Load

V (mph)	111.00
$K_d$	0.85
$K_z$	0.85
$K_{zt}$	1.00

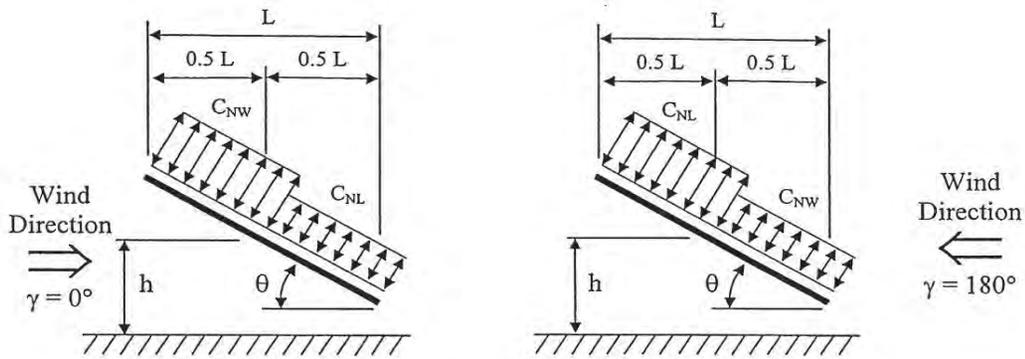
$$q_h = 22.79$$

Wind pressure on the open roof according to ASCE7-10 .

$$P = q_h G C_N$$

G	0.85
$I_w$	1.00

$C_N$  are given in the following Fig.



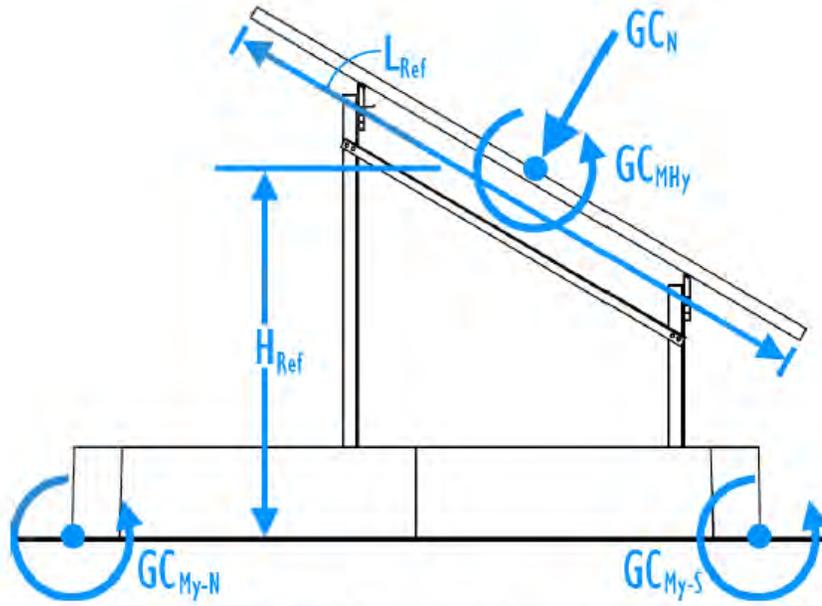
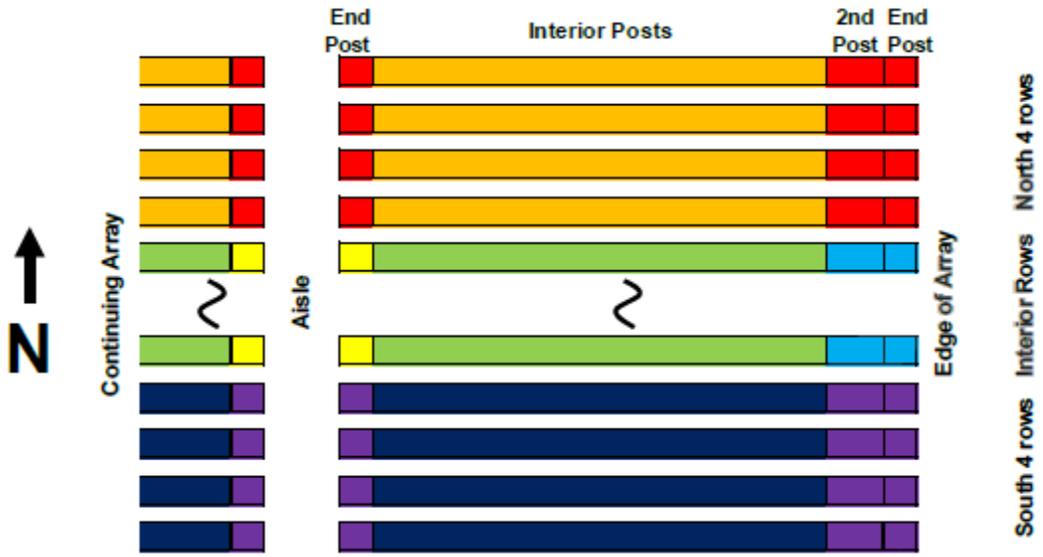
	CASE B		CASE A	
Windward	$C_{NW}$	2.33	$C_{NW}$	1.83
	$C_{NL}$	0.80	$C_{NL}$	1.90
Leeward	$C_{NW}$	-2.43	$C_{NW}$	-1.60
	$C_{NL}$	-0.37	$C_{NL}$	-1.67

#### 4. Foundation

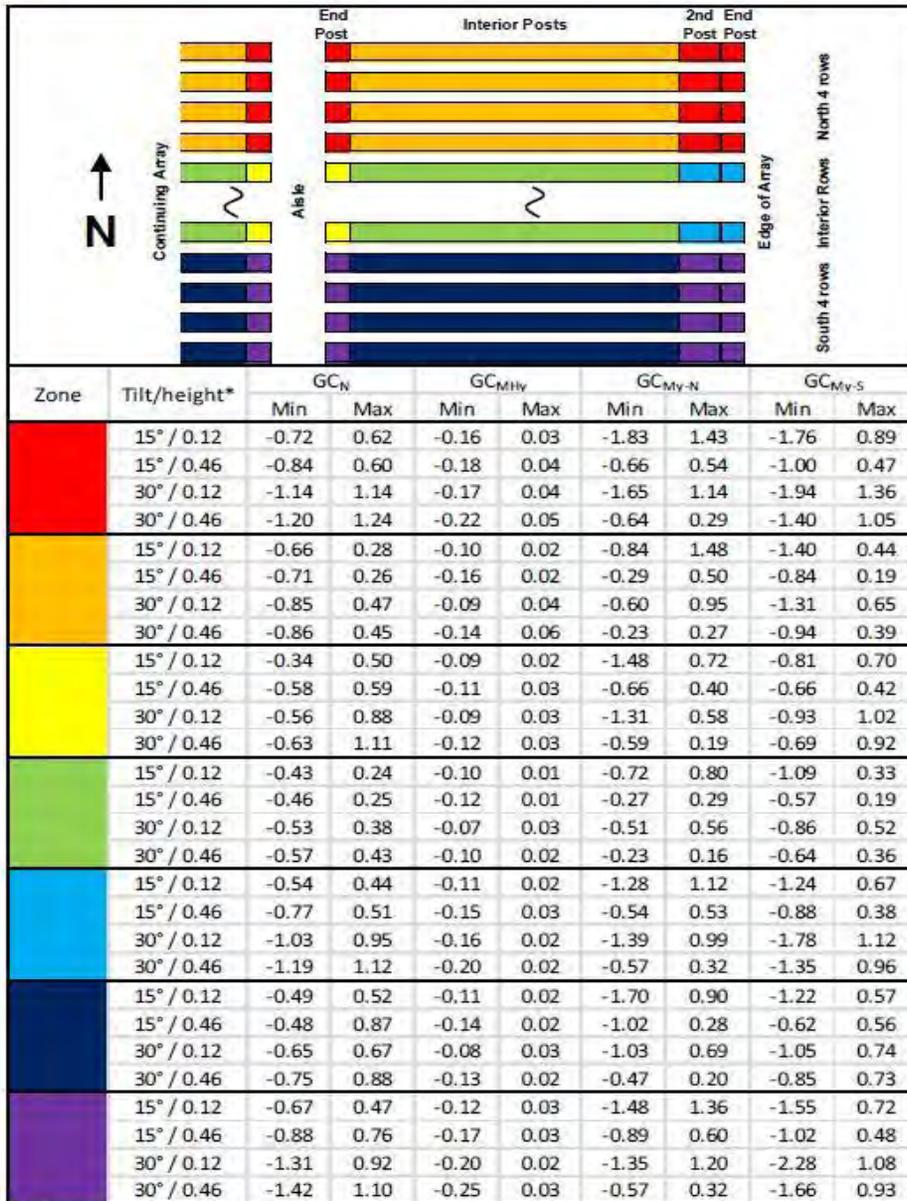
The results of wind load factors including normal and overturning moments provided by CPP are located in the calculation sheets. The results are given for two opposite directions of wind which causes upward and downward wind forces calculated based on worst case design wind loads.

$GC_N$  is the normal force factor,  $GC_{MyN}$  is the moments about northern pivot point and  $GC_{MyS}$  is the moment about southern pivot point. As it is apparent and highlighted in worksheets, the overturning moment about the southern point due the wind forces in upward direction is the critical case. Northern interior posts receive the highest upward force.

The factor of safety is calculated based on the worst case scenario, when the dead load and full wind loads are present. The resisting ballast weight and moments (about the southern pivot point) are calculated based on the superstructure and tub weight as given in the worksheet.



Schematic of wind load coefficients – PourInPlace System



\* Height is expressed as the ratio of the gap from the ground to the low edge of the PV divided by the c<sub>t</sub> interpolation between configurations is allowed

Figure 5: Peak wind load coefficients – Pour-in-Place System

**GC<sub>N</sub> Factors (Pour-in-Place)**

		North Row Ends	North Row Mid	Mid Aisles	Mid Row Mid	Mid Row Ends	South Row Mid	South Row Ends
Tilt	H* Ratio	Min	Min	Min	Min	Min	Min	Min
15	0.12	-0.72	-0.66	-0.34	-0.43	-0.54	-0.49	-0.67
15	0.46	-0.84	-0.71	-0.58	-0.46	-0.77	-0.48	-0.88
30	0.12	-1.14	-0.85	-0.56	-0.53	-1.03	-0.65	-1.31
30	0.46	-1.2	-0.86	-0.63	-0.57	-1.19	-0.75	-1.42
25	0.31	-1.045	-0.800	-0.558	-0.517	-0.969	-0.632	-1.177
Pressure (psf)	0	-14	-11	-8	-7	-13	-9	-16
Uplift per Panel (lbs)	0	-298	-228	-159	-147	-276	-180	-336
Uplift (vertical) per panel	0	-270	-207	-144	-134	-251	-163	-304
Horizontal force (lb) per panel	0	-126	-96	-67	-62	-117	-76	-142
Number of panels supported	0	2.50	4.00	3.50	5.00	3.50	4.00	2.50
Total uplift (lb)	0	-675	-827	-504	-668	-877	-654	-760
Total horizontal force (lb)	0	-315	-386	-235	-312	-409	-305	-355

**S Factors (Pour-in-Place)**

		North Row Ends	North Row Mid	Mid Aisles	Mid Row Mid	Mid Row Ends	South Row Mid	South Row Ends
Tilt	H* Ratio	Min	Min	Min	Min	Min	Min	Min
15	0.12	-1.76	-1.4	-0.81	-1.09	-1.24	-1.22	-1.55
15	0.46	-1	-0.84	-0.66	-0.57	-0.88	-0.62	-1.02
30	0.12	-1.94	-1.31	-0.93	-0.86	-1.78	-1.05	-2.28
30	0.46	-1.4	-0.94	-0.69	-0.64	-1.35	-0.85	-1.66
25	0.31	-1.536	-1.097	-0.772	-0.757	-1.372	-0.920	-1.706
Overturning moment per panel supported (ft-lbs)		-1472	-1051	-740	-726	-1315	-881	-1634
Number of panels supported		3.50	5.00	3.50	5.00	3.50	5.00	3.50
Overturning moment (ft-lbs)		-5151	-5255	-2590	-3628	-4601	-4406	-5721

**Uplift, overturning, and sliding control**

Friction coefficient	0.5
Safety factor	1.5
Dead load on post (lb)	266

	Combination	North Row Ends	North Row Mid	Mid Aisles	Mid Row Mid	Mid Row Ends	South Row Mid	South Row Ends
Total uplift vertical (lb)	W	-675	-1033	-504	-668	-877	-817	-1065
Effective weight on tubs (lb)	0.6D(post)+W	-553	-874	-345	-509	-717	-657	-905
Total Horiz. force (lb)	W	315	482	235	312	409	381	496

Min tub weight based on assumed safety factor (lb)		North Row Ends	North Row Mid	Mid Aisles	Mid Row Mid	Mid Row Ends	South Row Mid	South Row Ends
	<b>Control</b>							
	Friction control	1667	2069	1177	1612	2164	1610	1893
	Uplift control	830	1057	517	763	1076	797	958
	Overturning control	1474	1736	816	1335	1822	1397	1677
	Minimum needed	<b>1667</b>	<b>2069</b>	<b>1177</b>	<b>1612</b>	<b>2164</b>	<b>1610</b>	<b>1893</b>

**Soil pressure control on the tub edge**

		North Row Ends		North Row Mid		Mid Aisles		Mid Row Mid		Mid Row Ends		South Row Mid		South Row Ends	
Vertical force	D+0.75W+0.75S (or 0.45W)	2303	3294	3118	4044	2292	3252	3130	3974	3000	4239	2789	3871	2466	3468
Moment (lb-ft)		-1118	593	-1251	508	-855	674	-1117	452	-1406	642	-1082	673	-1220	492
e/L		0.49	0.18	0.40	0.13	0.37	0.21	0.36	0.11	0.47	0.15	0.39	0.17	0.49	0.14
Soil Stress (ksf)		0.13	0.42	0.20	0.50	0.16	0.43	0.22	0.48	0.17	0.53	0.19	0.50	0.14	0.43
Soil Stress (psi)		0.90	2.94	1.41	3.44	1.09	2.97	1.52	3.35	1.21	3.69	1.29	3.44	0.94	3.00
Vertical force (lb)	0.6D+0.6W (or 0.45W)	1151	2473	1402	2637	832	2111	1103	2228	1447	3099	1116	2559	1292	2629
Moment (lb-ft)		-1491	791	-1668	677	-1140	898	-1489	602	-1875	856	-1443	898	-1626	656
e/L		1.30	0.32	1.19	0.26	1.37	0.43	1.35	0.27	1.30	0.28	1.29	0.35	1.26	0.25
Soil Stress (ksf)		0.29	0.36	0.34	0.36	0.22	0.33	0.29	0.31	0.37	0.43	0.28	0.38	0.32	0.36
Soil Stress (psi)		2.04	2.47	2.34	2.51	1.54	2.28	2.02	2.14	2.57	2.99	1.98	2.61	2.25	2.48
Max soil pressure (ksf)		0.53		< 1.0 ksf Ok											
Max Soil Stress (psi)		3.69		< 5.2 psi Ok											

Tub bottom dimensions (ft)

1.53 \* 6

# SOLAR ENERGY INSTALLATION

## LOWELL ROAD SOLAR, LLC

87 LOWELL ROAD  
SALEM, NEW HAMPSHIRE

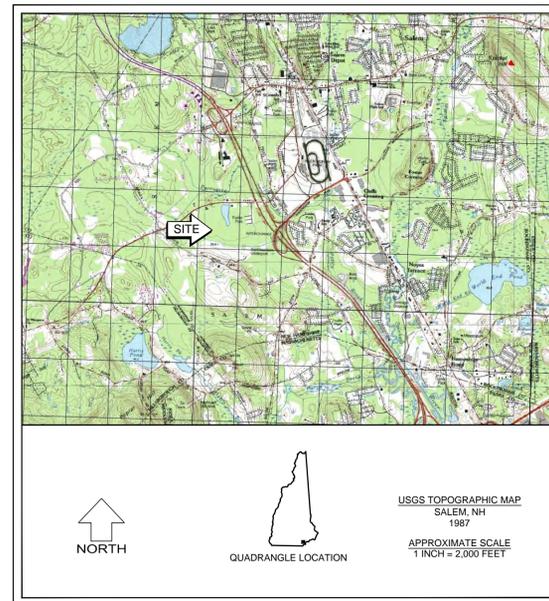
**OWNER**  
LL&S, INC. - SALEM, NH

**APPLICANT**  
LOWELL ROAD SOLAR, LLC

**SITE ENGINEER**  
NOBIS ENGINEERING, INC. - CONCORD, NH

**SOLAR ARRAY DESIGNER**  
AMERICAN CAPITAL ENERGY, INC. - LOWELL, MA

**SOLAR DEVELOPER**  
NH SOLAR GARDEN - STRATHAM, NH



OCTOBER 2015



### SHEET INDEX

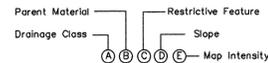
I.D.	NO.	DRAWING NAME
CS	1	COVER SHEET
S-1	2	EXISTING CONDITIONS PLAN
C-1	3	PLAN OVERVIEW
C-2	4	PROPOSED SITE PLAN
D-1	5	CONSTRUCTION DETAILS
D-2	6	CONSTRUCTION DETAILS
D-3	7	CONSTRUCTION DETAILS
E-1	8	ELECTRICAL PLAN

NO.	DATE	DESCRIPTION
REVISIONS		
<b>SOLAR ENERGY INSTALLATION</b> <b>LOWELL ROAD SOLAR, LLC</b> 87 LOWELL ROAD SALEM, NH ASSESSORS MAP 125 - LOT 8838		
PREPARED BY:		Nobis Engineering, Inc. 18 Chenell Drive Concord, NH 03301 T(603) 224-4182 www.nobiseng.com
SCALE: AS SHOWN	DATE : OCTOBER 2015	
OWNER:	LL&S INC 59 STILES ROAD SUITE 106 SALEM, NH 03079	SALEM PLANNING BOARD APPROVAL:
ZONE: COMMERCIAL / INDUSTRIAL B DISTRICT		
<b>COVER SHEET</b>		<b>SHEET CS</b>
DRAWN BY:	CHECKED BY:	PROJECT NO.
SM	CA	89320.12
		SHEET NO.
		1 OF 8

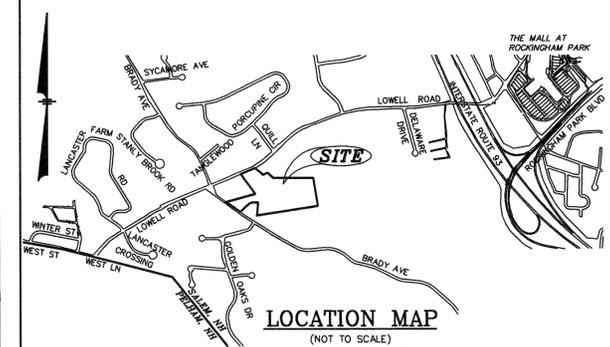
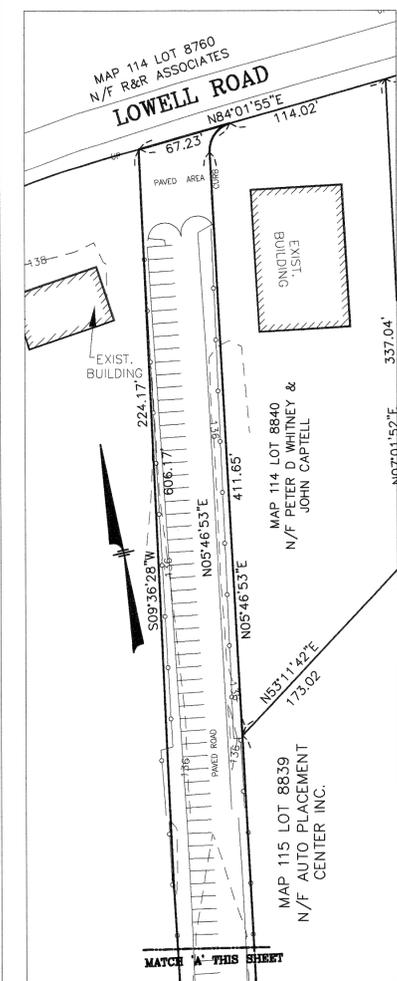
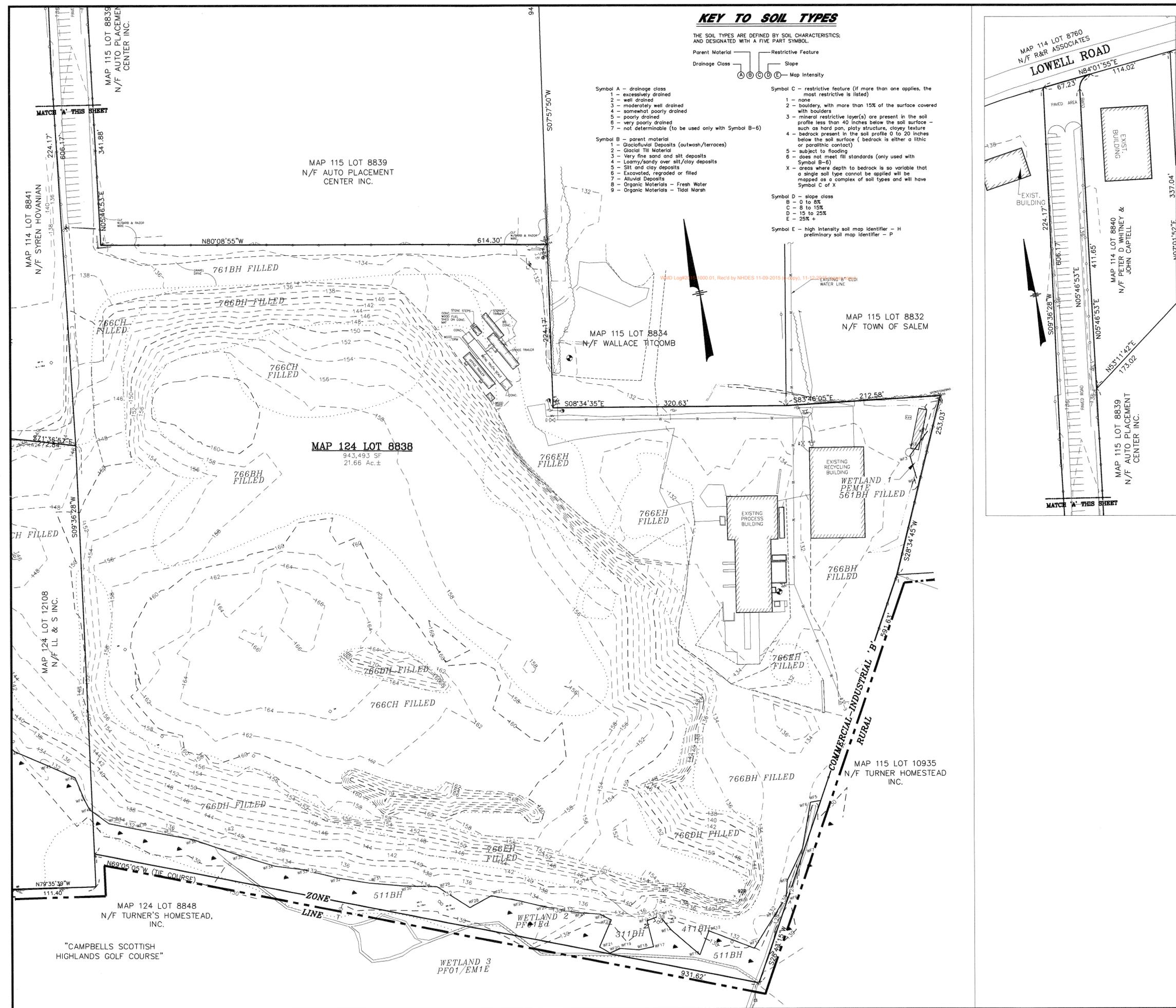
NOT ISSUED FOR CONSTRUCTION

**KEY TO SOIL TYPES**

THE SOIL TYPES ARE DEFINED BY SOIL CHARACTERISTICS AND DESIGNATED WITH A FIVE PART SYMBOL.



- Symbol A - drainage class**
- 1 - excessively drained
  - 2 - well drained
  - 3 - moderately well drained
  - 4 - somewhat poorly drained
  - 5 - poorly drained
  - 6 - very poorly drained
  - 7 - not determinable (to be used only with Symbol B-6)
- Symbol B - parent material**
- 1 - Glaciofluvial Deposits (outwash/terraces)
  - 2 - Glacial Till Material
  - 3 - Very fine sand and silt deposits
  - 4 - Loamy/sandy over silt/clay deposits
  - 5 - Silt and clay deposits
  - 6 - Excavated, regraded or filled
  - 7 - Alluvial Deposits
  - 8 - Organic Materials - Fresh Water
  - 9 - Organic Materials - Tidal Marsh
- Symbol C - restrictive feature (if more than one applies, the most restrictive is listed)**
- 1 - none
  - 2 - bouldery, with more than 15% of the surface covered with boulders
  - 3 - mineral restrictive layer(s) are present in the soil profile less than 40 inches below the soil surface - such as hard pan, platy structure, clayey texture
  - 4 - bedrock present in the soil profile 0 to 20 inches below the soil surface (bedrock is either a lithic or paralithic contact)
  - 5 - subject to flooding
  - 6 - does not meet fill standards (only used with Symbol B-6)
- Symbol D - slope class**
- B - 0 to 8%
  - C - 8 to 15%
  - D - 15 to 25%
  - E - 25% +
- Symbol E - high intensity soil map identifier - H preliminary soil map identifier - P**



**NOTES:**

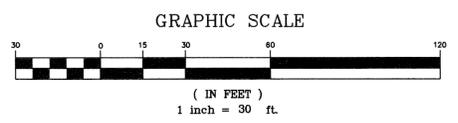
1) FOR GENERAL NOTES SEE SHEET 1.

**SOIL MAPPING NOTES**

1) HIGH INTENSITY SOIL MAPPING WAS PERFORMED TO THE STANDARDS OF THE SOCIETY OF SOIL SCIENTISTS OF NORTHERN NEW ENGLAND SPECIAL PUBLICATION NUMBER 1, HIGH INTENSITY SOIL MAPS FOR NEW HAMPSHIRE, STANDARDS, JAN. 1994.

HIGH INTENSITY SOIL SURVEY PERFORMED ON

BY  
**GOVE ENVIRONMENTAL SERVICES, INC.**  
P.O. BOX 118  
EXETER, NH 03833-0118



NO	DESCRIPTION	BY	DATE
REVISIONS			

**EXISTING CONDITIONS PLAN**

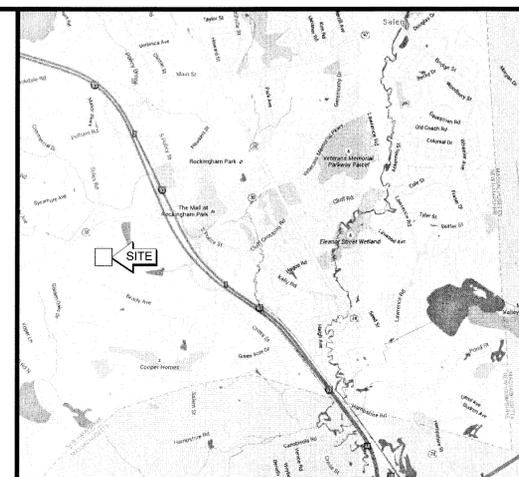
PREPARED FOR:  
**LL & S INC.**  
87 LOWELL ROAD  
SALEM, NEW HAMPSHIRE 03079  
SALEM PROPERTY MAP 124 - LOT 8838  
PROPERTY ADDRESS - 87 LOWELL ROAD



103 Siles Road, Suite One  
Salem, New Hampshire 03079  
(603) 893-0720  
ENGINEERS • PLANNERS • SURVEYORS

SCALE: 1" = 60'	DATE: APRIL 5, 2000
OWNER OF RECORD LL & S INC. 87 LOWELL ROAD SALEM, NEW HAMPSHIRE 03079 BOOK 2391 PAGE 1741	SALEM PLANNING BOARD APPROVAL
ZONE: COMMERCIAL INDUSTRIAL 'B'	

DESIGNED BY: MSG	DRAWN/CHECKED DMC/MSG	DWG. NAME 884ECP.DWG	PROJECT No. 88499	SHEET No. 2
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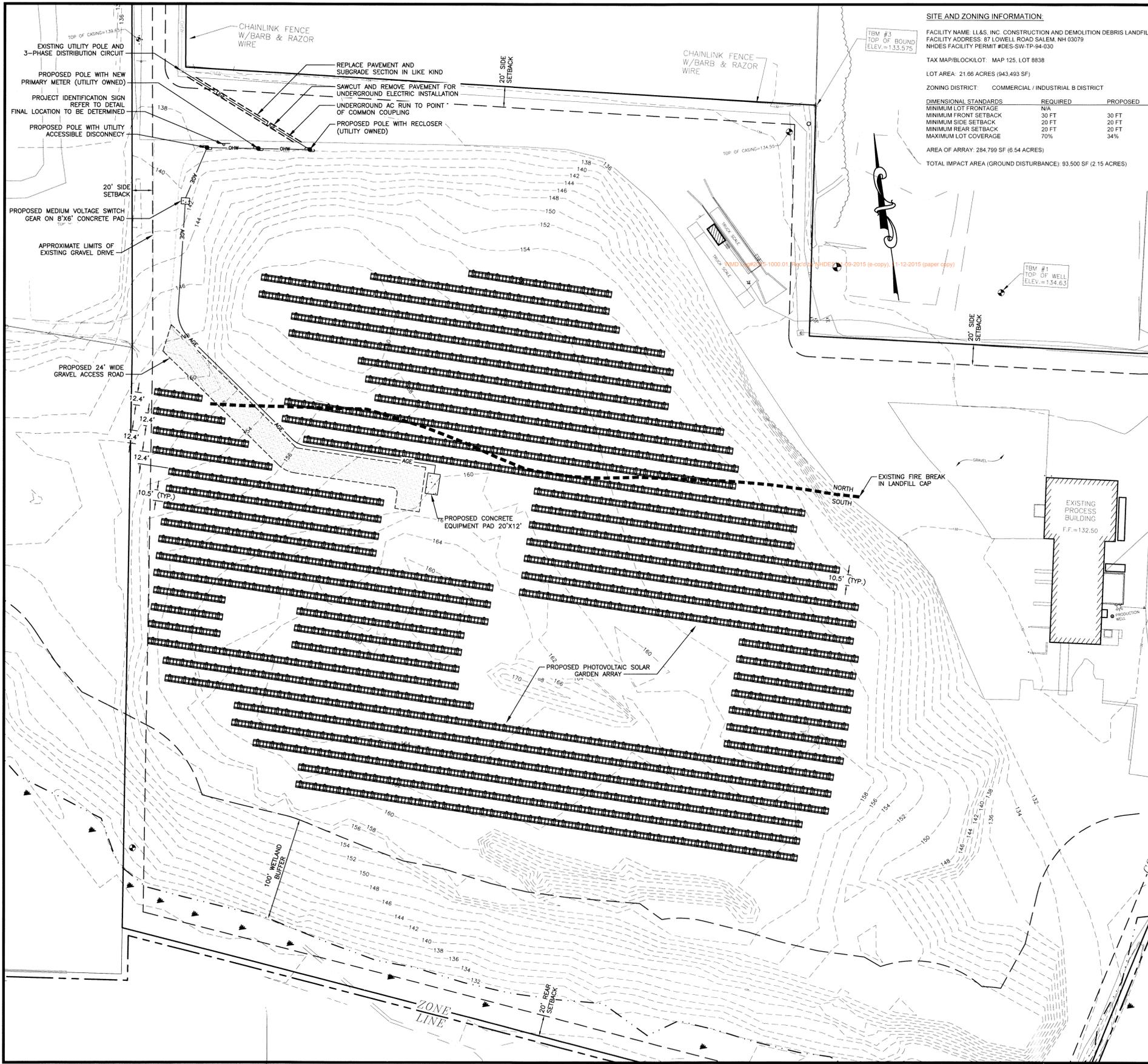
**LEGEND**

—	SUBJECT PROPERTY LINE	⊙	DRAIN MANHOLE
- - -	OTHER PROPERTY LINE	⊕	CATCH BASIN
- · - · -	EXISTING SETBACKS AND EASEMENTS	⊙	UTILITY POLE
- · - · -	ZONING BOUNDARY	⊕	PAD MOUNTED TRANSFORMER
—	STONE WALL	⊕	SANITARY SEWER MANHOLE
- · - · -	RETAINING WALL	⊕	SANITARY SEWER CLEAN-OUT
- · - · -	EDGE OF WETLAND	⊕	HYDRANT
- · - · -	STREAM / RIVER	⊕	WATER VALVE
- · - · -	FEMA FLOODPLAIN	⊕	WATER SHUT OFF
- · - · -	TREE LINE	⊕	WATER SUPPLY WELL
- · - · -	CHAIN LINK FENCE	⊕	SIGN POST
- · - · -	MAJOR CONTOUR	⊕	LIGHT POLE
- · - · -	MINOR CONTOUR	⊕	MANHOLE
- · - · -	DRAIN LINE	⊕	TELECOM MANHOLE
- · - · -	UNDER DRAIN	⊕	ELECTRIC MANHOLE
- · - · -	FOUNDATION DRAIN	⊕	STEEP SLOPE
- · - · -	SWALE FLOW DIRECTION	⊕	TREE
- · - · -	SILT FENCE / WADDE	⊕	WETLAND
- · - · -	OVERHEAD UTILITY WIRE	⊕	
- · - · -	UNDERGROUND ELECTRIC	⊕	
- · - · -	ABOVEGROUND ELECTRIC	⊕	
- · - · -	UNDERGROUND TELECOM	⊕	
- · - · -	SANITARY SEWER LINE	⊕	
- · - · -	SANITARY SEWER SERVICE	⊕	
- · - · -	SANITARY SEWER FORCE MAIN	⊕	
- · - · -	WATER LINE	⊕	
- · - · -	WATER SERVICE	⊕	
- · - · -	GAS LINE	⊕	
- · - · -	CONCRETE	⊕	
- · - · -	GRAVEL	⊕	
- · - · -	RIP RAP	⊕	
- · - · -	SOLAR PANELS AND RACKING	⊕	

0 100' 200'  
GRAPHIC SCALE

NO.	DATE	DESCRIPTION
REVISIONS		
<b>SOLAR ENERGY INSTALLATION</b>		
<b>LOWELL ROAD SOLAR, LLC</b>		
87 LOWELL ROAD SALEM, NH		
ASSESSORS MAP 125 - LOT 8838		
PREPARED BY:	 Nobis Engineering, Inc. 18 Chenell Drive Concord, NH 03301 T(603) 224-4182 www.nobiseng.com	
SCALE: AS SHOWN	DATE: OCTOBER 2015	
OWNER:	SALEM PLANNING BOARD APPROVAL:	
LL&S INC 59 STILES ROAD SUITE 106 SALEM, NH 03079		
ZONE: COMMERCIAL / INDUSTRIAL B DISTRICT		
<b>OVERVIEW PLAN</b>		<b>SHEET C-1</b>
DRAWN BY:	CHECKED BY:	PROJECT NO.
SM	CA	89320.12
		SHEET NO.
		3 OF 8

J:\89320.12 - Lowell Road Solar, LLC - SALEM\CAD\DWG\89320.12-C-000-SITE.dwg 10/8/2015 1:37 PM



**SITE AND ZONING INFORMATION**

FACILITY NAME: LL&S, INC. CONSTRUCTION AND DEMOLITION DEBRIS LANDFILL  
 FACILITY ADDRESS: 87 LOWELL ROAD SALEM, NH 03079  
 NHDES FACILITY PERMIT #DES-SW-TP-94-030

TAX MAP/BLOCK/LOT: MAP 125, LOT 8838

LOT AREA: 21.66 ACRES (943,493 SF)

ZONING DISTRICT: COMMERCIAL / INDUSTRIAL B DISTRICT

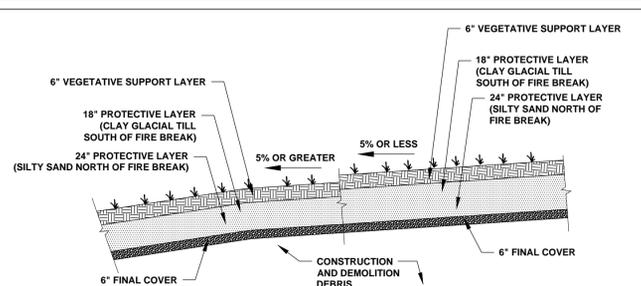
DIMENSIONAL STANDARDS	REQUIRED	PROPOSED
MINIMUM LOT FRONTAGE	N/A	
MINIMUM FRONT SETBACK	30 FT	30 FT
MINIMUM SIDE SETBACK	20 FT	20 FT
MINIMUM REAR SETBACK	20 FT	20 FT
MAXIMUM LOT COVERAGE	70%	34%

AREA OF ARRAY: 284,799 SF (6.54 ACRES)  
 TOTAL IMPACT AREA (GROUND DISTURBANCE): 93,500 SF (2.15 ACRES)

- NOTES**
- EXISTING CONDITIONS, TOPOGRAPHIC INFORMATION, NORTH ORIENTATION, NORTH ARROW, AND COORDINATE VALUES DEPICTED ON THESE DRAWINGS ARE BASED ON SURVEY PREPARED BY MHF CONSULTANTS DATED JULY 5, 1999 FOR LL&S, INC. CONTRACTOR SHALL VERIFY PRIOR TO START OF CONSTRUCTION.
  - THIS DRAWING HAS BEEN PREPARED FOR LOWELL ROAD SOLAR, LLC AND THE TOWN OF SALEM PLANNING BOARD.
  - THIS PLAN IS TO BE USED FOR PERMITTING ONLY AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES. THE PLAN IS FOR THE LAYOUT OF THE SOLAR PANEL ARRAY ONLY.
  - THE LOCATION AND ELEVATION OF EXISTING SITE FEATURES INCLUDING BUT NOT LIMITED TO TOPOGRAPHY, WETLANDS, PROPERTY LINES, SITE PHYSICAL FEATURES, AND UTILITIES ARE APPROXIMATE. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL ELEVATIONS, SITE FEATURES, AND LOCATING ALL UTILITIES PRIOR TO ANY CONSTRUCTION AND SHALL NOTIFY ENGINEER AND OWNER IMMEDIATELY OF ANY CONFLICTS.
  - THE LOCATION OF THE SOLAR ARRAY SHOWN HEREIN IS APPROXIMATE AND WILL BE ADJUSTED DURING CONSTRUCTION TO AVOID STEEP SLOPES AND OTHER SITE FEATURES AS NEEDED.
  - PROJECT DISTURBANCE SHALL NOT EXCEED 100,000 SQUARE FEET (SF). IMPACTS AS SHOWN HEREON ARE APPROXIMATELY 93,500 SF. IF IMPACTS EXCEED 100,000 SF, THE OWNER SHALL OBTAIN A NHDES ALTERATION OF TERRAIN PERMIT PRIOR TO CONSTRUCTION. APPLICANT MET WITH NHDES ALTERATION OF TERRAIN BUREAU ON OCTOBER 7, 2015 TO REVIEW IMPACT CALCULATIONS AND TO VERIFY AN ALTERATION OF TERRAIN PERMIT IS NOT REQUIRED FOR THE PROJECT AS SHOWN HEREIN.
  - DISTURBANCE OF ONE (1) OR MORE ACRES OF LAND WILL REQUIRE A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT IN ACCORDANCE WITH FEDERAL NPDES REGULATIONS AT 40CFR 122. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEVELOPING AND FOLLOWING A STORMWATER POLLUTION PREVENTION PLAN (SWPPP). THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR OBTAINING A NPDES NOI PRIOR TO THE START OF CONSTRUCTION.
  - NO ALTERATIONS TO THE EXISTING LANDFILL CAP ARE PROPOSED AS PART OF THE SOLAR ARRAY DEVELOPMENT. ALL SOLAR FOUNDATIONS, CONDUITS AND ACCESS ROADS WILL BE CONSTRUCTED ABOVE THE EXISTING CAP.
  - THE PROPERTY IS LOCATED WITHIN ZONE X, AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, AS SHOWN ON THE FLOOD INSURANCE RATE MAP FOR ROCKINGHAM COUNTY NH PLAN NO. 33015C0563E, EFFECTIVE DATE MAY 17, 2005.
  - THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING DIG SAFE (1-888-DIG-SAFE) AT LEAST 72 HOURS PRIOR TO COMMENCEMENT OF WORK. THE CONTRACTOR SHALL COORDINATE WORK WITH THE TOWN FIRE AND POLICE DEPARTMENTS.
  - REFER TO CONSTRUCTION DETAILS FOR EROSION AND SEDIMENT CONTROL AND SOLAR PANEL ARRAY DETAILS.
  - ALL VEGETATION CONTROL SHALL BE COMPLETED BY MECHANICAL OR MANUAL MEANS. NO CHEMICALS ARE TO BE USED ON-SITE FOR VEGETATION CONTROL. ALL AREAS OF DISTURBANCE SHALL BE RESTORED WITH LOAM AND SEED FOR STABILIZATION AND REVEGETATION.
  - CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF CONSTRUCTION DEBRIS AT THE LL&S, INC. DISPOSAL FACILITY.
  - CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES WITHIN THE LIMIT OF WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO EXISTING UTILITIES AND ALL COSTS ASSOCIATED WITH REPLACEMENT OR REPAIR SHALL BE BORNE BY THE CONTRACTOR.
  - CONTRACTOR SHALL PROTECT ALL SITE FEATURES SHOWN HEREIN. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO EXISTING SITE FEATURES AND ALL COSTS ASSOCIATED WITH DAMAGES TO EXISTING SITE FEATURES AND ALL COSTS ASSOCIATED WITH REPLACEMENT OR REPAIR SHALL BE BORNE BY THE CONTRACTOR.
  - THE CONTRACTOR SHALL OBTAIN AND PAY FOR ADDITIONAL PERMITS, NOTICES, AND FEES NECESSARY TO COMPLETE THE WORK AND ARRAYS AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
  - MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND TOWN OF SALEM REGULATIONS.
  - ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
  - THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANIES.
  - ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
  - THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, IF ANY, AND ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATES TO THE OWNER PRIOR TO THE COMPLETION OF THIS PROJECT.
  - THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
  - CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
  - AS-BUILT PLANS SHALL BE PREPARED, CERTIFIED, AND STAMPED BY A LICENSED LAND SURVEYOR AND SUBMITTED TO THE TOWN OF SALEM BY THE CONTRACTOR.
  - NOMINAL SIZE OF PV SYSTEM IS 1316.7 KW DC USING 4,180 CANADIAN SOLAR 315W MODULES MOUNTED ON GAME CHANGE BALLASTED RACKING SYSTEM.
  - FINAL COMPONENTS AND CONFIGURATION OF SOLAR PV SYSTEM SUBJECT TO CHANGE.
  - PROPOSED PV SYSTEM LAYOUT BASED ON 25 DEGREE TILT ANGLE AT 180 DEGREE AZIMUTH. ROW SPACING VARIES AS SHOWN. SYSTEM DESIGNED FOR NO INTER-ROW SHADING ON DECEMBER 21 BETWEEN THE HOURS OF 9AM AND 3PM APPROXIMATELY.
  - ALL WORK SHALL COMPLY WITH CONDITIONS SET FORTH IN THE PENDING NHDES TYPE 1-B FACILITY PERMIT MODIFICATION.
  - MATERIAL STOCKPILES WILL NOT BE ALLOWED OVER THE LANDFILL CAP. IF ANY MATERIALS ARE STOCKPILED ELSEWHERE ON-SITE THEY MUST BE SURROUNDED BY PERIMETER SEDIMENT CONTROLS SUCH AS SILT FENCE OR SEDIMENT LOGS.

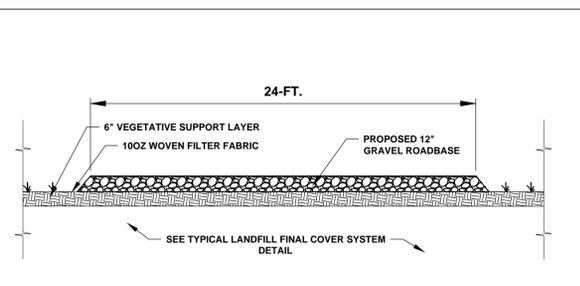
NO.	DATE	DESCRIPTION	
REVISIONS			
<b>SOLAR ENERGY INSTALLATION</b> <b>LOWELL ROAD SOLAR, LLC</b> 87 LOWELL ROAD SALEM, NH ASSESSORS MAP 125 - LOT 8838			
PREPARED BY:		 Nobis Engineering, Inc. 18 Chenell Drive Concord, NH 03301 T(603) 224-4182 www.nobiseng.com	
SCALE: AS SHOWN		DATE: OCTOBER 2015	
OWNER:		SALEM PLANNING BOARD APPROVAL:	
LL&S, INC. 59 STILES ROAD SUITE 106 SALEM, NH 03079			
<b>ZONE: COMMERCIAL / INDUSTRIAL B DISTRICT</b>			
<b>PROPOSED SITE PLAN</b>		<b>SHEET C-2</b>	
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
SM	CA	89320.12	4 OF 8

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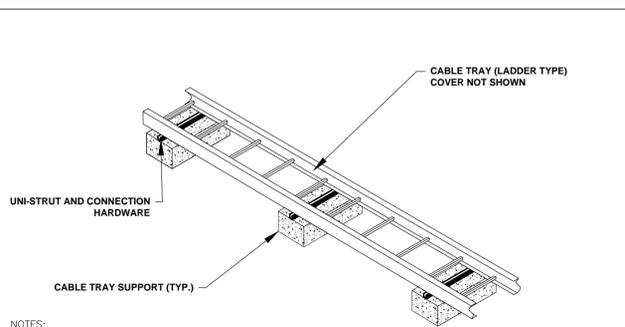
- NOTES:
- CONSTRUCTION EQUIPMENT MUST RECEIVE PERMISSION FROM THE ENGINEER OF RECORD PRIOR TO DRIVING ON THE LANDFILL.

**1** TYPICAL LANDFILL FINAL COVER SYSTEM CROSS SECTION  
SCALE: N.T.S.



- NOTES:
- CONSTRUCTION EQUIPMENT MUST RECEIVE PERMISSION FROM THE ENGINEER OF RECORD PRIOR TO DRIVING ON THE LANDFILL.

**2** PROPOSED LANDFILL ACCESS ROAD CROSS SECTION  
SCALE: N.T.S.



- NOTES:
- CABLE TRAY AND ALL RELATED HARDWARE TO BE GALVANIZED.
  - CABLE TRAY SUPPORTS SHALL BE SPACED PER THE MFG. SPECIFICATION.
  - EXPANSION AND SPLICE FITTINGS SHALL BE INSTALLED PER THE NEC AND MANUFACTURERS SPECIFICATIONS.
  - CABLE TRAY TYPE AND DIMENSIONS SHALL BE BASED ON FINAL CONDUIT AND WIRE PLAN.
  - CRUSHED STONE TO BE ADDED BENEATH CABLE TRAY SUPPORTS AS NEEDED TO LEVEL TRAY.
  - CABLE TRAY AND SUPPORTS SHALL NOT BE INSTALLED SUCH THAT STORMWATER FLOW SHALL BE IMPACTED.

**3** TYPICAL ABOVE-GROUND CABLE TRAY AND SUPPORT DETAIL  
SCALE: N.T.S.

**EROSION CONTROL NOTES:**

**SCHEDULE OF WORK**  
THIS WORK IS ANTICIPATED TO BEGIN IN THE SPRING 2016 WITH A FINAL COMPLETION DATE IN SUMMER 2016. NO WINTER EARTH DISTURBANCE IS EXPECTED FOR THIS PROJECT. SHOULD WINTER WORK BE REQUIRED, THIS PLAN AND THE ACCOMPANYING STORM WATER POLLUTION PREVENTION PLAN (SWPPP) SHALL BE MODIFIED ACCORDINGLY.

ADEQUATE MEASURES SHOULD BE TAKEN TO MINIMIZE AIR BORNE DUST PARTICLES ARISING FROM SOIL DISTURBANCE AND CONSTRUCTION.

- \* DISTURBANCE OF AREAS SHOULD BE MINIMIZED AND NOT EXCEED 100,000 SQUARE FEET IN AREA AT ANY ONE TIME.
- \* NO DISTURBED AREA SHOULD BE LEFT UNSTABILIZED FOR LONGER THAN TWO WEEKS DURING THE GROWING SEASON.
- \* PERMANENT EROSION CONTROL FEATURES SHOULD BE INCORPORATED INTO THE PROJECT AT THE EARLIEST PRACTICABLE TIME, AS SPECIFIED ON THE CONTRACT PLANS.
- \* WITHIN 14 DAYS OF COMPLETING WORK IN AN AREA, AND PRIOR TO ANTICIPATED RAIN EVENTS, APPLY HAY/STRAW MULCH AND TACKIFIER ON ALL DISTURBED SOIL AREAS. APPLICATION RATES OF 2 TONS OF STRAW OR HAY PER ACRE SHOULD BE USED TO PREVENT EROSION UNTIL VEGETATIVE COVER CAN BE ESTABLISHED.
- \* AS WORK PROGRESSES, PATCH SEEDING AND MULCHING SHOULD BE DONE AS REQUIRED ON AREAS PREVIOUSLY TREATED TO MAINTAIN OR ESTABLISH PROTECTIVE COVER.
- \* REMOVE ACCUMULATED SEDIMENTS AND DEBRIS WHEN SEDIMENT CONTAINMENT DEVICES REACH 33% CAPACITY.

**EROSION CONTROL IMPLEMENTATION SCHEDULE**  
THE FOLLOWING GENERAL SCHEDULE IDENTIFIES THE PROPOSED SOIL EROSION AND SEDIMENT CONTROL AND STORM WATER MANAGEMENT MEASURES THAT ARE TO BE IMPLEMENTED PRIOR TO AND DURING CONSTRUCTION:

- \* INSTALL TEMPORARY SOIL STABILIZATION MEASURES INCLUDING SEED, MATTING, ETC.
- \* PLACE HUMUS AND CONDUCT PERMANENT SEEDING AND MULCHING OF ALL DISTURBED GROUND.

**TEMPORARY STABILIZATION:**  
EROSION CONTROL MEASURES SHALL BE IMPLEMENTED, AS WRITTEN HEREIN AND AS DEPICTED ON THE ACCOMPANYING PLAN, FROM THE COMMENCEMENT OF CONSTRUCTION ACTIVITY UNTIL FINAL STABILIZATION IS COMPLETE:

**TACKIFIER:** PLACEMENT OF SOIL TACKIFIER HAS PROVEN TO BE AN EFFECTIVE METHOD OF PREVENTING SOIL AND ADHERING MULCH IN PLACE. THE PLACEMENT OF A SOIL TACKIFIER SHOULD BE PERFORMED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS AND SHALL BE REAPPLIED AS NECESSARY TO CONTROL AIR BORN DUST AND SOIL, AND MULCH LOSS UNTIL PERMANENT VEGETATION IS ESTABLISHED.

**ROAD CLEANING:** THE CONTRACTOR SHALL SWEEP ROADS DAILY, OR AS NEEDED TO MAINTAIN CLEAN PAVED SURFACES AT ALL CONSTRUCTION ACCESS/EGRESS POINTS.

**DUST CONTROL:** THE CONTRACTOR SHALL IMPLEMENT DUST CONTROL MEASURES AS NEEDED TO PREVENT AIRBORNE DUST PARTICLES FROM LEAVING THE SITE. DUST CONTROL MEASURES SHALL CONSIST OF USE OF A WATER TRUCK EQUIPPED WITH A SPRAY-BAR THAT DISSIPATES THE WATER EVENLY OVER THE SURFACE.

**PERMANENT STABILIZATION:** THE CONTRACTOR WILL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL FOR ONE YEAR AFTER COMPLETION.

AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:

- A BASE COARSE GRAVELS HAVE BEEN INSTALLED.
- A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED.
- A MINIMUM OF 3\"/>

ALL ACCESS DRIVEWAY AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.

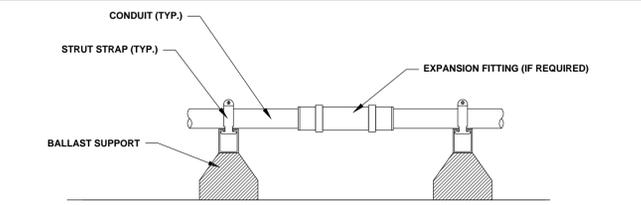
**STORMWATER POLLUTION PREVENTION PLAN:**  
THE CONTRACTOR SHALL OBTAIN COVERAGE UNDER THE USEPA NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) CONSTRUCTION GENERAL PERMIT FOR STORM WATER DISCHARGES PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND IMPLEMENTING AN EPA STORM WATER POLLUTION PREVENTION PLAN (SWPPP) FOR CONSTRUCTION. THE SWPPP PLAN SHALL OUTLINE DETAILED SPECIFICATIONS FOR IMPLEMENTATION, INSPECTION, AND MAINTENANCE OF ALL EROSION CONTROL MEASURES. THE CONTRACTOR HAS SOLE RESPONSIBILITY FOR COMPLIANCE WITH THE EROSION AND SEDIMENT CONTROL PLAN, SHALL BE RESPONSIBLE FOR AMENDING THE SWPPP ACCORDINGLY, AND SHALL BE RESPONSIBLE FOR ANY PENALTIES RESULTING FROM LACK OF COMPLIANCE. IF THE PROJECT DISTURBS ONE OR MORE ACRES OF LAND, THE CONTRACTOR MUST OBTAIN NPDES COVERAGE WHICH INCLUDES SUBMITTING AN NOI AND PREPARING A WRITTEN SWPPP. THE CONTRACTOR MUST MEET ALL APPLICABLE REQUIREMENTS UNDER THE CONSTRUCTION GENERAL PERMIT INCLUDING CONSULTATION WITH THE NEW HAMPSHIRE DIVISION OF HISTORICAL RESOURCES BEFORE ANY EARTH MOVING DISTURBANCES OCCUR.

**WINTER CONSTRUCTION NOTES:**

- ALL PROPOSED POST-DEVELOPMENT VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY NOVEMBER 15, OR WHICH ARE DISTURBED AFTER NOVEMBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 4:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE PLACEMENT OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.

**CONSTRUCTION SEQUENCE AND EROSION CONTROL:**

- CONSTRUCT EROSION CONTROL BARRIER(S) AS DEPICTED ON THE DESIGN PLANS.
- THE SITE SUBCONTRACTOR SHALL MAINTAIN SEDIMENTATION AND EROSION CONTROL DEVICES THROUGHOUT THE PROJECT SITE FOR THE DURATION OF THE CONSTRUCTION.
- BEGIN INSTALLATION OF SUPPORT PIERS FOR SOLAR RACKING SYSTEM AND WIRING.
- INSTALL SOLAR RACKING SYSTEM.
- INSTALL SOLAR PANELS, TRANSFORMER, GENERATOR, AND/OR OTHER MECHANICAL EQUIPMENT.
- INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES DAILY.
- COMPLETE PERMANENT SEEDING, IF NECESSARY.
- REMOVE TEMPORARY CONTROL MEASURES ONCE EXPOSED AREAS ARE STABILIZED AND PERMANENT EROSION AND SEDIMENT FACILITIES ARE INSTALLED AND ACCOMPLISH FINAL CLEAN UP.
- ALL DISTURBED AREAS SHALL BE STABILIZED WITH GRASS.
- THE LENGTH OF TIME AN AREA CAN BE DISTURBED AND UNSTABILIZED IS 45 DAYS.
- THE SEQUENCE OF CONSTRUCTION MAY OVERLAP AND VARY AS NECESSARY.



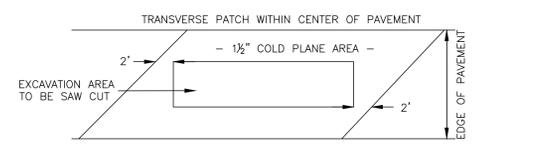
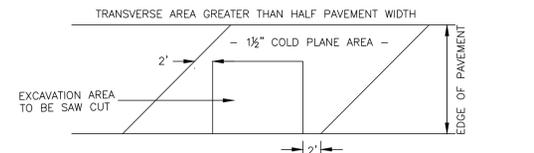
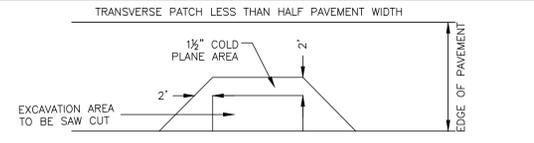
- NOTES:
- ALL CONDUIT RELATED HARDWARE TO BE GALVANIZED.
  - CONDUIT SUPPORTS SHALL BE SPACED PER THE NEC.
  - EXPANSION AND SPLICE FITTINGS SHALL BE INSTALLED PER THE NEC AND MANUFACTURER SPECIFICATIONS.
  - CONDUIT TYPE AND DIMENSIONS SHALL BE BASED ON FINAL CONDUIT AND WIRE PLAN.
  - CRUSHED STONE TO BE ADDED BENEATH CABLE TRAY SUPPORTS AS NEEDED TO LEVEL CONDUIT.
  - CONDUIT AND SUPPORTS SHALL NOT BE INSTALLED SUCH THAT STORMWATER FLOW SHALL BE IMPACTED.
  - CONTRACTOR MAY USE BALLASTED ABOVEGROUND CABLE TRAY AS A SUBSTITUTE TO CONDUIT.

**4** TYPICAL ABOVE-GROUND CONDUIT AND SUPPORT DETAIL  
SCALE: N.T.S.

AMERICAN CAPITAL ENERGY, INC.  
IN CASE OF EMERGENCY, DIAL: 911  
OWNER AND OPERATION & MAINTENANCE PROVIDER:  
AMERICAN CAPITAL ENERGY, INC.  
(978) 221-2000  
UTILITY: LIBERTY UTILITIES  
(855) 349-9455

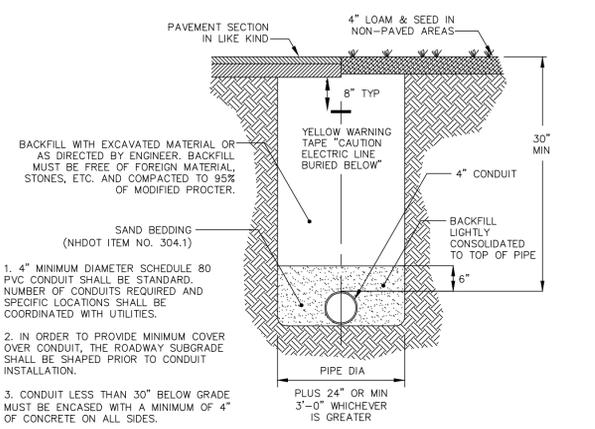
- NOTES:
- SIGN TO BE RATED FOR OUTDOOR USE.
  - SIGN TO BE 1'-0" (HEIGHT) x 2'-0" (WIDTH).
  - SIGN TO BE ATTACHED TO FENCE OR ON MOUNTABLE SIGN POST ADJACENT TO ARRAY SWITCH GEAR PAD.
  - PROPOSED SIGN WILL COMPLY WITH ZONING BYLAW REQUIREMENTS.

**5** PROJECT IDENTIFICATION SIGN  
SCALE: N.T.S.



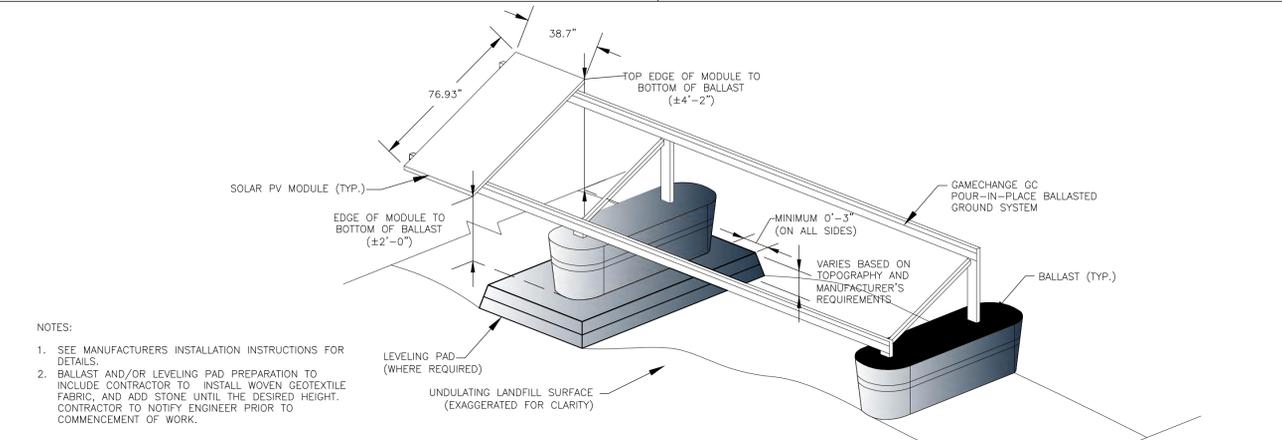
NOTE: WHERE LIMITS OF ADJACENT COLD PLANED AREAS ARE LESS THAN OR EQUAL TO 20', THE AREA BETWEEN SHALL BE COLD PLANED AND RESURFACED.

**SAWCUT DETAIL**  
NOT TO SCALE



- 4" MINIMUM DIAMETER SCHEDULE 80 PVC CONDUIT SHALL BE STANDARD. NUMBER OF CONDUITS REQUIRED AND SPECIFIC LOCATIONS SHALL BE COORDINATED WITH UTILITIES.
- IN ORDER TO PROVIDE MINIMUM COVER OVER CONDUIT, THE ROADWAY SUBGRADE SHALL BE SHAPED PRIOR TO CONDUIT INSTALLATION.
- CONDUIT LESS THAN 30" BELOW GRADE MUST BE ENCASED WITH A MINIMUM OF 4" OF CONCRETE ON ALL SIDES.

**TYPICAL UNDERGROUND CONDUIT TRENCH DETAIL**  
NOT TO SCALE



- NOTES:
- SEE MANUFACTURERS INSTALLATION INSTRUCTIONS FOR DETAILS.
  - BALLAST AND/OR LEVELING PAD PREPARATION TO INCLUDE CONTRACTOR TO INSTALL WOVEN GEOTEXTILE FABRIC, AND ADD STONE UNTIL THE DESIRED HEIGHT. CONTRACTOR TO NOTIFY ENGINEER PRIOR TO COMMENCEMENT OF WORK.

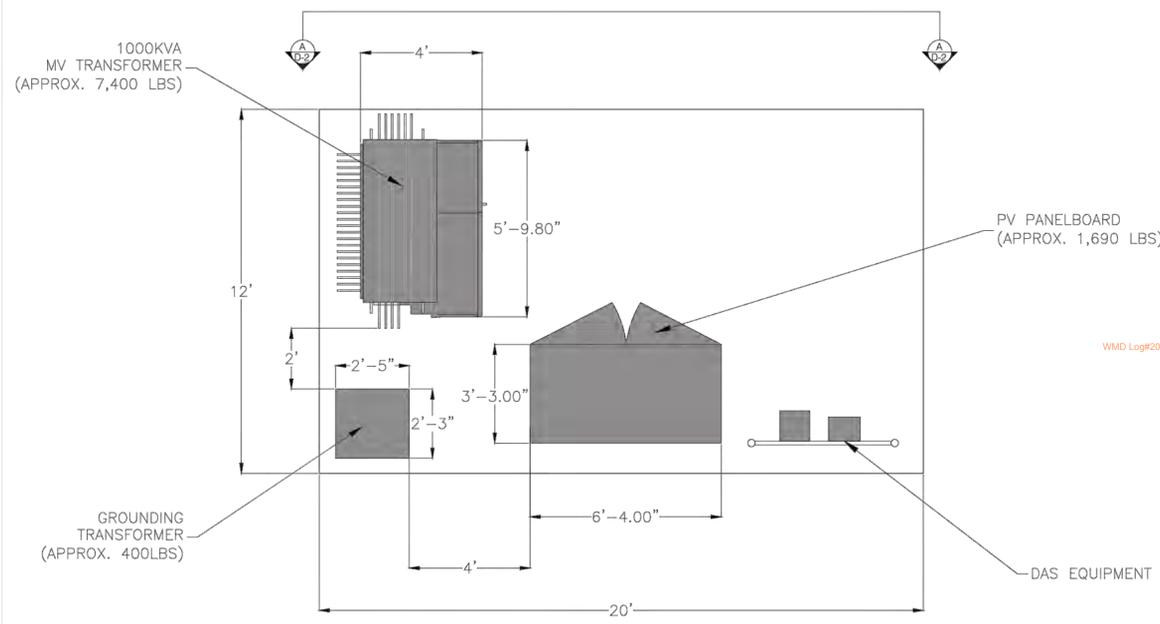
**6** RACKING DETAIL  
SCALE: N.T.S.

NO.	DATE	DESCRIPTION
REVISIONS		
<b>SOLAR ENERGY INSTALLATION</b> <b>LOWELL ROAD SOLAR, LLC</b>		
87 LOWELL ROAD SALEM, NH		
ASSESSORS MAP 125 - LOT 8838		
PREPARED BY:	<b>Nobis</b> Engineering a Sustainable Future	
	Nobis Engineering, Inc. 18 Chenell Drive Concord, NH 03301 T(603) 224-4182 www.nobiseng.com	
SCALE: AS SHOWN	DATE : OCTOBER 2015	
OWNER:	SALEM PLANNING BOARD APPROVAL:	
LLAS INC 59 STILES ROAD SUITE 106 SALEM, NH 03079		
ZONE: COMMERCIAL / INDUSTRIAL B DISTRICT		
<b>CONSTRUCTION DETAILS</b>		<b>SHEET</b> <b>D-1</b>
DRAWN BY:	CHECKED BY:	PROJECT NO.
SM	CA	89320.12
		SHEET NO.
		5 OF 8

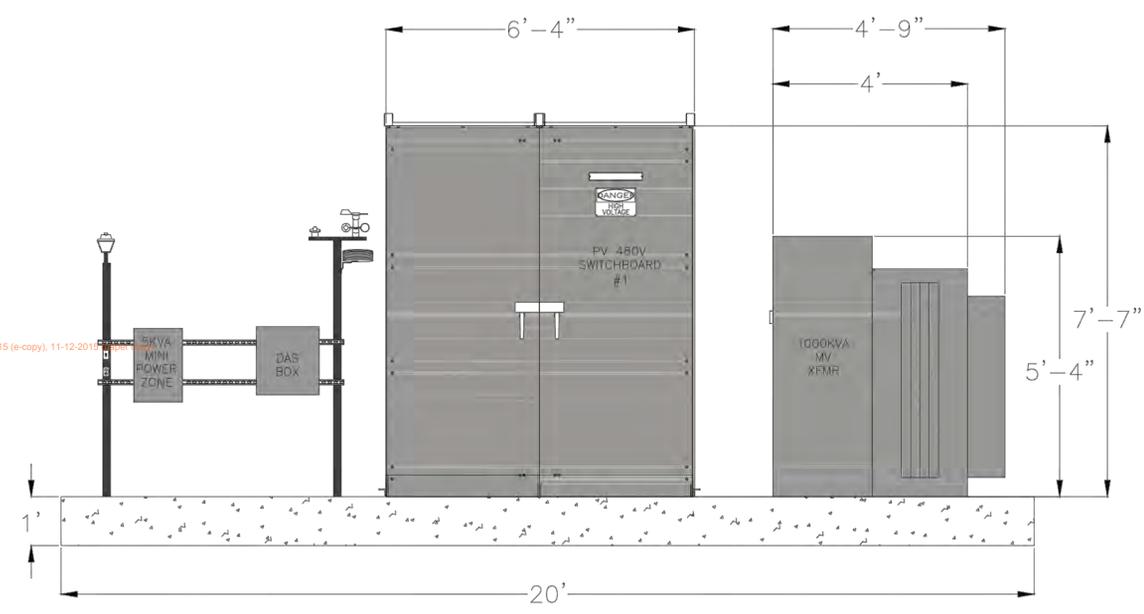
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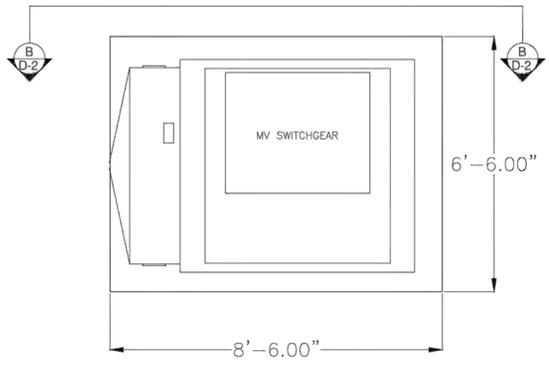
**AMERICAN CAPITAL ENERGY, INC.**  
1001 Pawtucket Blvd, Suite 278  
Lowell, MA 01854  
Phone 978-221-2000



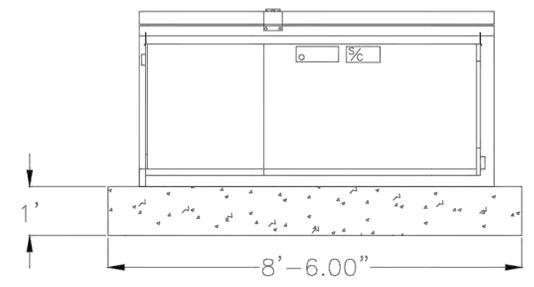
INVERTER PAD PLAN DETAIL  
(NOT TO SCALE)



INVERTER PAD ELEVATION DETAIL  
(NOT TO SCALE)



SWITCHGEAR PAD PLAN DETAIL  
(NOT TO SCALE)



SWITCHGEAR PAD ELEVATION DETAIL  
(NOT TO SCALE)

NO.	DATE	DESCRIPTION
REVISIONS		
<b>SOLAR ENERGY INSTALLATION</b> <b>LOWELL ROAD SOLAR, LLC</b> <b>87 LOWELL ROAD</b> <b>SALEM, NH</b> ASSESSORS MAP 125 - LOT 8838		
PREPARED BY:  Nobis Engineering, Inc. 18 Chenell Drive Concord, NH 03301 T(603) 224-4182 www.nobiseng.com		DATE : OCTOBER 2015
OWNER: LLAS INC 59 STILES ROAD SUITE 106 SALEM, NH 03079		SALEM PLANNING BOARD APPROVAL:
<b>CONSTRUCTION DETAILS</b>		
<b>SHEET D-2</b>		
DRAWN BY: SM	CHECKED BY: CA	PROJECT NO. 89320.12
		SHEET NO. 6 OF 8

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 Lowell, MA 01854  
 Phone 978-221-2000

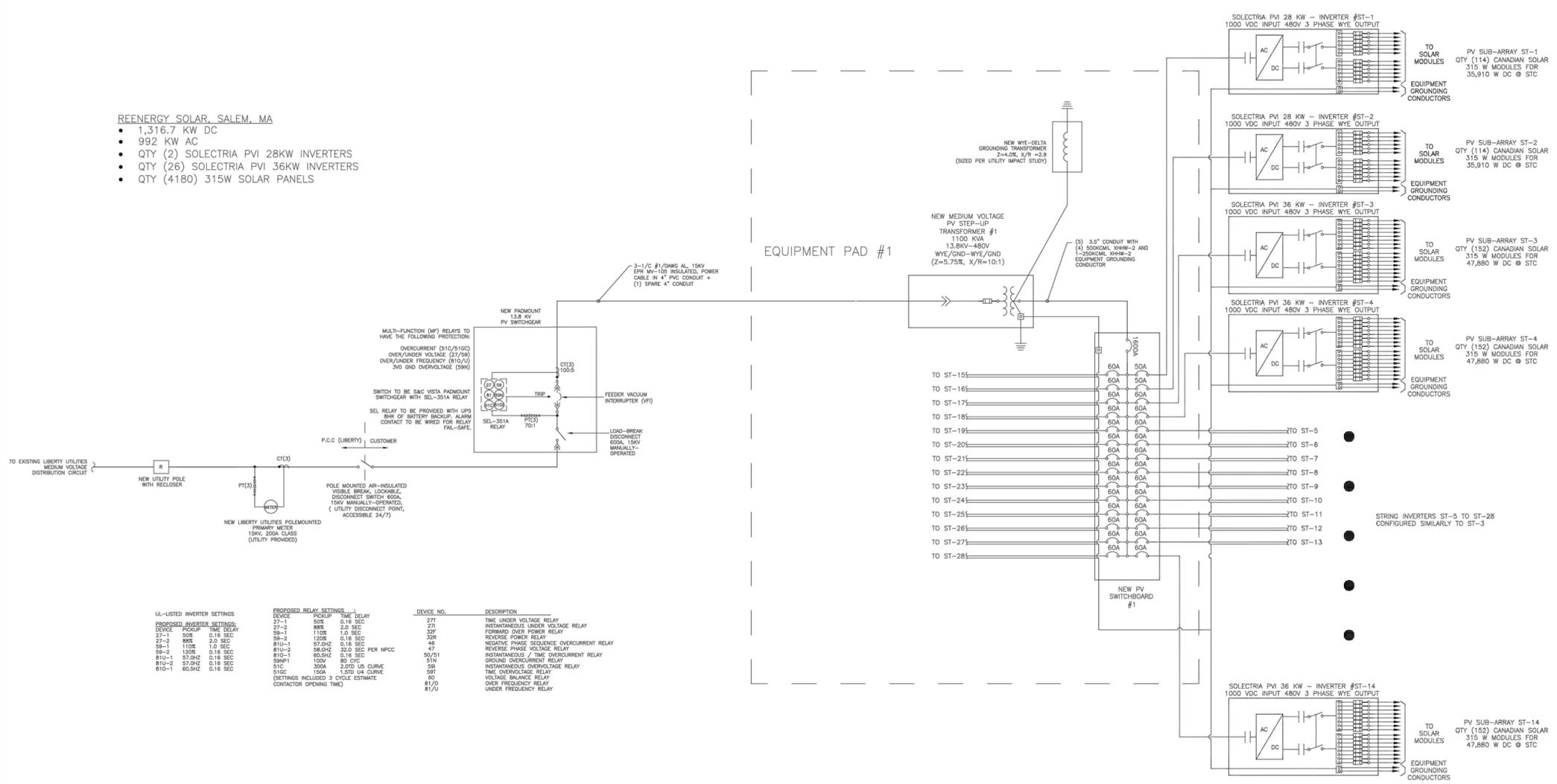
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NOTES:  
1. SOLECTRIA PVI STRING INVERTERS ARE EQUIPPED WITH ACTIVE ANTI-ISLANDING DETECTION AS REQUIRED BY UL1741/IEEE1547

- REENERGY SOLAR, SALEM, MA
- 1,316.7 KW DC
  - 992 KW AC
  - QTY (2) SOLECTRIA PVI 28KW INVERTERS
  - QTY (26) SOLECTRIA PVI 36KW INVERTERS
  - QTY (4180) 315W SOLAR PANELS



UL-LISTED INVERTER SETTINGS	PROPOSED RELAY SETTINGS	DEVICE NO.	DESCRIPTION
PROPOSED INVERTER SETTINGS	27-1 50% 0.16 SEC	277	TIME UNDER VOLTAGE RELAY
DEVICE PICKUP TIME DELAY	27-2 80% 2.0 SEC	271	INSTANTANEOUS UNDER VOLTAGE RELAY
27-1 20% 0.16 SEC	28-1 11.0% 0.16 SEC	227	FORWARD OVER POWER RELAY
27-2 80% 2.0 SEC	28-2 12.0% 0.16 SEC	226	REVERSE POWER RELAY
28-1 11.0% 0.16 SEC	810-1 57.0% 0.16 SEC	48	NEGATIVE PHASE SEQUENCE OVERCURRENT RELAY
27-2 80% 2.0 SEC	810-2 57.0% 0.16 SEC PER NPOC	47	REVERSE PHASE VOLTAGE RELAY
28-1 11.0% 0.16 SEC	810-1 60.5% 0.16 SEC	50/21	INSTANTANEOUS / TIME OVERCURRENT RELAY
27-2 80% 2.0 SEC	810-2 60.5% 0.16 SEC	514	GROUND OVERCURRENT RELAY
28-1 11.0% 0.16 SEC	50P1 100% 50.0% CFC	514	TIME OVERCURRENT RELAY
27-2 80% 2.0 SEC	51C 300A 2.0TD US CURVE	59	INSTANTANEOUS OVERVOLTAGE RELAY
28-1 11.0% 0.16 SEC	51D 100A 1.5TD US CURVE	59T	TIME OVERVOLTAGE RELAY
810-1 60.5% 0.16 SEC	60	60	VOLTAGE BALANCE RELAY
	61	61	OVER FREQUENCY RELAY
	81/0	81/0	UNDER FREQUENCY RELAY
			CONTACTOR OPENING TIME

NO.	DATE	DESCRIPTION
REVISIONS		
<b>SOLAR ENERGY INSTALLATION</b> <b>LOWELL ROAD SOLAR, LLC</b> <b>87 LOWELL ROAD</b> <b>SALEM, NH</b> ASSESSORS MAP 125 - LOT 8838		
PREPARED BY:		 Nobis Engineering, Inc. 18 Chenell Drive Concord, NH 03301 T(603) 224-4182 www.nobiseng.com
SCALE: AS SHOWN		DATE: OCTOBER 2015
OWNER:		SALEM PLANNING BOARD APPROVAL:
LLAS INC 59 STILES ROAD SUITE 106 SALEM, NH 03079		
ZONE: COMMERCIAL / INDUSTRIAL B DISTRICT		
<b>ELECTRICAL PLAN</b> <b>AC SINGLE LINE DIAGRAM</b>		<b>SHEET</b> <b>E-1</b>
DRAWN BY:	CHECKED BY:	PROJECT NO.
SM	CA	89320.12
		SHEET NO.
		8 OF 8

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Phone 978-221-2000

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