

TOWN OF PLAINFIELD ZONING AND BUILDING PERMIT APPLICATION



Property Owner:

Name: Phone:

Street: Email:

City State Zip:

Project: **Permit Type:** (Check one) Building Zoning

Street Address:

Tax Map: Lot Number: Lot Acreage: Zoning District:

Proposed project distances to property lines (in feet): Front: Rear: Side: Side:

State Approved Septic Design #: Driveway Permit #:

Please provide a written description of the project including appropriate dimensions:

Contractor Information:

Builder:	Electrician:	Plumber:
Name: <input type="text" value="Norwich Technologies"/>	Name: <input type="text"/>	Name: <input type="text"/>
Phone: <input type="text" value="603-667-1479 (Terry Donoghue)"/>	Phone: <input type="text"/>	Phone: <input type="text"/>

Applicant Signature: Date:

Required Attachments:

Please provide a copy of plans detailing the project. If construction plans are not available, attach a hand drawn map detailing the project.

Permits cannot be issued without receipt of the proper fee. If you are unsure of the amount due or have any questions about your application, contact the town office (603-469-3201).

TOWN USE: Current Use: Yes / No ZBA: Yes / No PB: Yes / No

BOARD OF SELECTMEN ACTION

_____ Approved _____ Denied

Permit #: _____ Date: _____

Rec 5/7/15



KIMBALL UNION
A C A D E M Y

Office of Operations & Planning

Application for Special Exception

Ground-mounted Solar System

Kimball Union Academy is proposing the installation of a ground-mounted solar energy system in the Village Residential Zone (VR) that will be connected to a commercial metering system. Therefore, the system requires a special exception and/or site plan review under the new Section 3.8 Solar Energy Systems of the Town of Plainfield Zoning Ordinance.

Project Description: The proposed solar energy system will be approximately 130 x 180 feet in area and consist of 360 panels. The panels will be mounted on steel frames and connected to the ground using ground screws. The system is designed to generate approximately 115 kW of DC power. The system will be connected by underground conduit to a commercial meter that is located off the south-west corner of the Miller Bicentennial Hall. Approximately two acres of existing wooded land will be cleared to accommodate the panels and remove potential for shading of the panels.

Location: The solar energy system will be located directly south of the Miller Bicentennial Hall, toward the end of our current maintenance road that runs between Welch and Kilton Dormitories on a gentle south-facing slope. The size and location of the system was chosen so that surrounding neighbors to the campus would have very little to no visual impact. An area of particular concern are the residents of Baynes Road, and a buffer of existing wooded area will be left in place between the system and the houses located on Baynes Road. (see attached site plan) A side view of the system will be minimally visible to the campus residences at the lower end Main Street. (see attached visual analysis)

Fencing: The system will make use of a code-approved protective mesh to cover and conceal all electrical cabling. (see attached Solarscrim description) The system will be used for educational purposes as well as the generation of electricity and students will gain a first-hand familiarity with the system and proper safety precautions to be exercised around it.

Description of Project



- 100 kW/AC ground-mounted solar array (<14ft height above ground) located approximately 200 yards behind the KUA's Miller Bicentennial Hall on Main St., Meriden. The overall site is bounded to the north by Main St., to the south by Bonner Rd., to the east by Rt 120, and to the west by Baynes Rd. 3-Phase interconnection to the electrical grid and Liberty Utilities will be via a transformer behind Miller Hall.

Abutters



BAYNES ROAD
HOME OWNERS ASSOCIATION
C/O ZUCKERMAN
PO BOX #7
MERIDEN, NH 03770

BRAGNETZ, THOMAS JAMES
& ELIZABETH JANE
PO BOX 195
MERIDEN, NH 03770

AJUD, ALBERTA
PO BOX 103
MERIDEN, NH 03770

MILLARD, ROBERT MADDOULE
MILLARD, HEIN
PO BOX 85
MERIDEN, NH 03770

MVD LLC
PO BOX 1212
CONCORD, NH 03302-1212

TOWNSEND, SARAH MIREVITE
21 ALICE PECK DAY DRIVE #106
LEBANON, NH 03766

BAYNES ROAD
HOME OWNERS ASSOCIATION
C/O ZUCKERMAN
PO BOX #7
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& ROBERT D JR
PO BOX 319
MERIDEN, NH 03770

L'HEUREUX, CONRAD
& MICHELLE
PO BOX 428
MERIDEN, NH 03770

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CONCORD, NH 03302-1212

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& ELIZABETH
13 BAYNES RD
MERIDEN, NH 03770

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& CLAIRE L
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MERIDEN, NH 03770

BIATHROW, CRAIG F
& PAULA C
885 RTE 120
MERIDEN, NH 03770

HERVET, NICOLE L
& ROBERT D JR
PO BOX 319
MERIDEN, NH 03770

MERIDEN VOLUNTEER FIRE DEPT
PO BOX 337
MERIDEN, NH 03770

MVD LLC
PO BOX 1212
CONCORD, NH 03302-1212

TK DELL LLC
899 ROUTE 120
MERIDEN, NH 03770

ZUCKERMAN, STEVEN
& SHARON
PO BOX 7
MERIDEN, NH 03770

ESTEY, LOUI D
& ROBERT D JR
PO BOX 319
MERIDEN, NH 03770

O'LEARY, HEIRS OF JOHN J
C/O O'LEARY, ERIC
PO BOX 172
MERIDEN, NH 03770

MCNAMARA, MICHAEL F
HOWARD LOUISA
34 BEAN RD
PLAINFIELD, NH 03761

SWETT FAMILY 2008 TRUST, THE
SWETT, RICHARD & MARCIA TRS
175 WINDY HILL RD
MERIDEN, NH 03770

MERIDEN VOLUNTEER FIRE DEPT
PO BOX 337
MERIDEN, NH 03770

YOUNG, STACY H
& CLAIRE L
PO BOX 428
MERIDEN, NH 03770

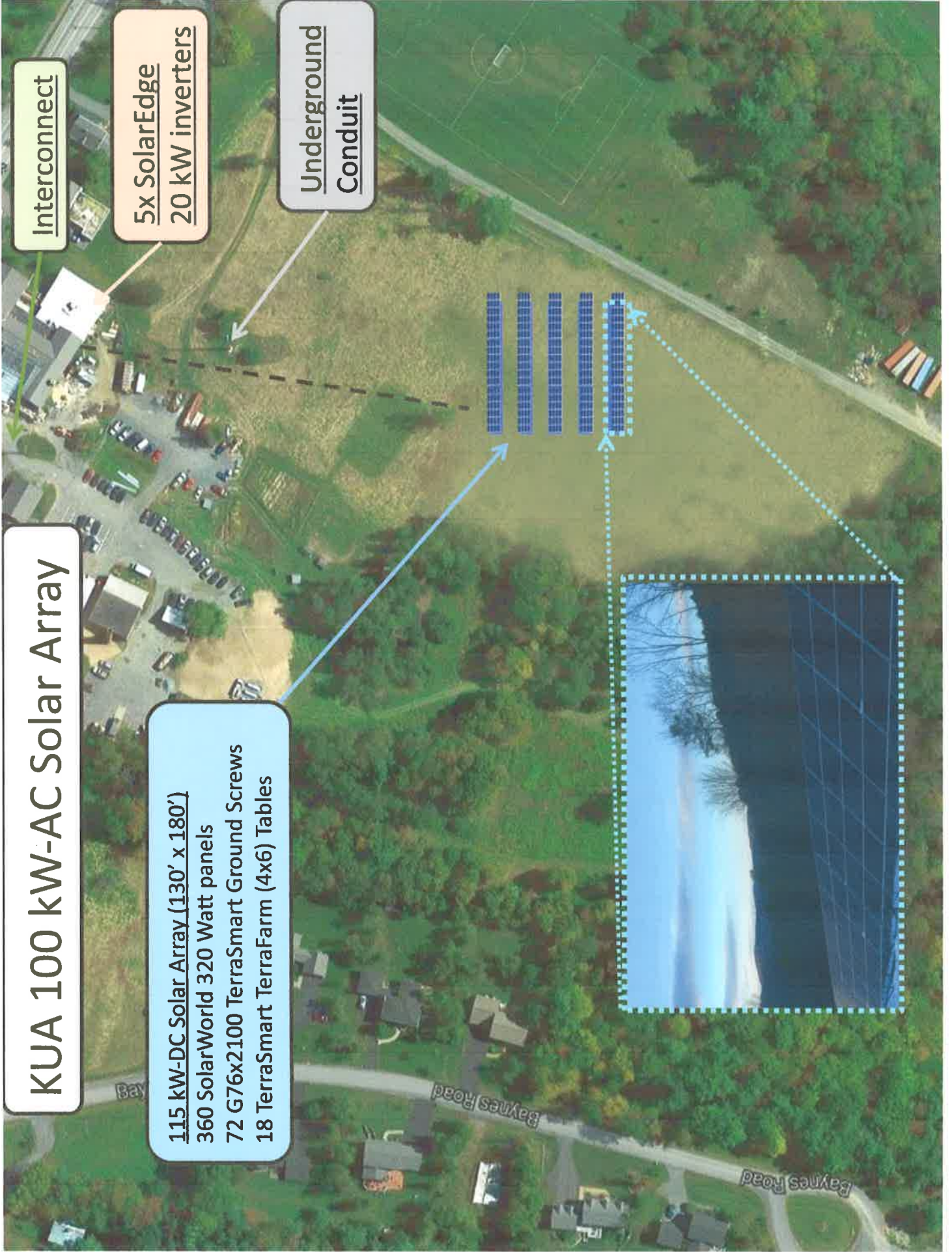
KUA 100 kW-AC Solar Array

- 115 kW-DC Solar Array (130' x 180')
- 360 SolarWorld 320 Watt panels
- 72 G76x2100 TerraSmart Ground Screws
- 18 TerraSmart TerraFarm (4x6) Tables

Interconnect

5x SolarEdge
20 kW inverters

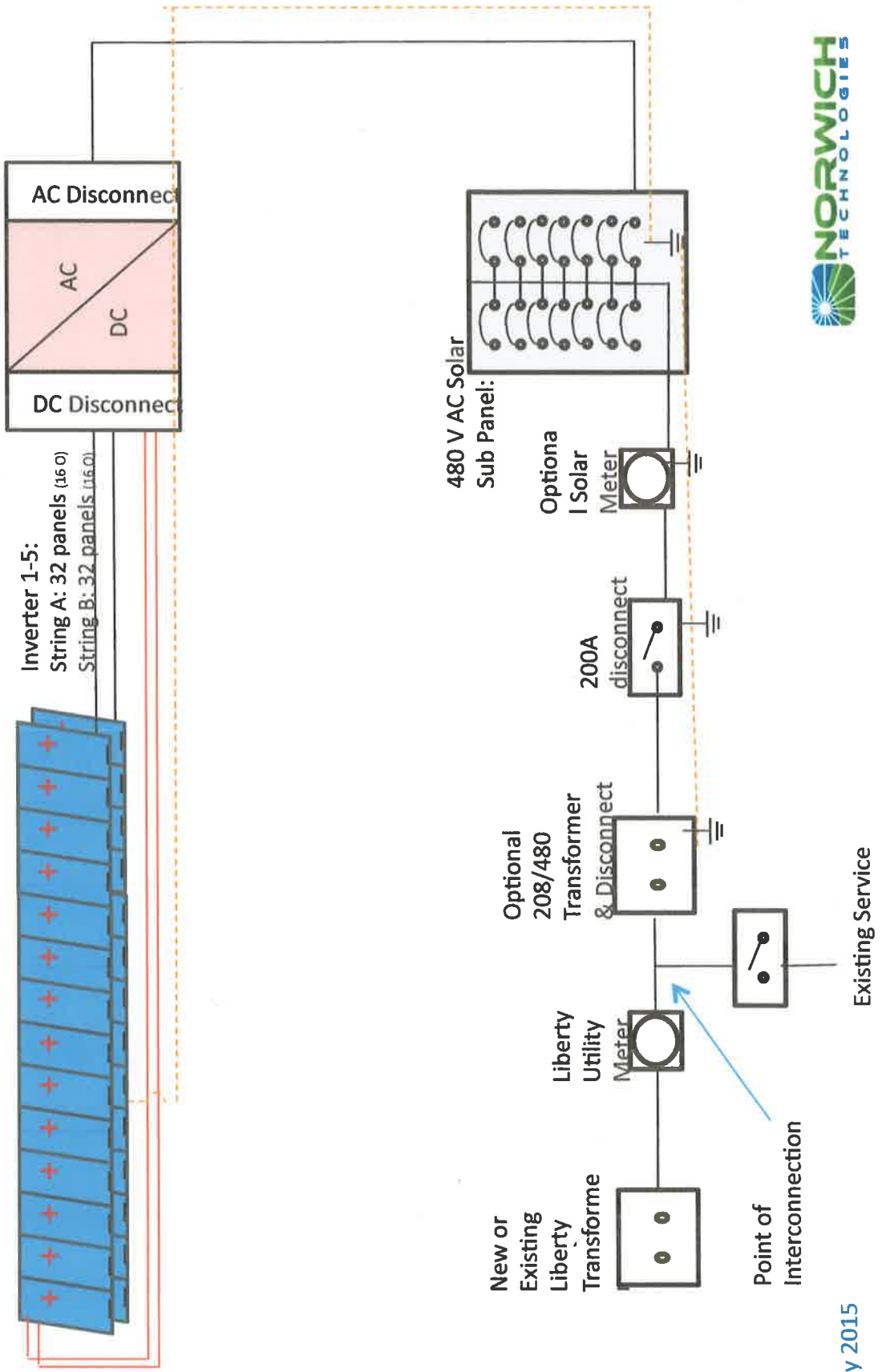
Underground
Conduit



1-line Electrical Diagram



Electrical One-line for Solar Array: 5x SolarEdge SE-20K 3-phase 480VAC inverters
 360X SolarWorld 320W panels with 180 SolarEdge P700 optimizers



Visual Analysis



Solar array not visible



Visual Analysis



Solar array not visible



2-Bean Rd

Visual Analysis



Solar array not visible. It will be substantially set back from property line with additional natural screening



Visual Analysis



4- Chellis Rd



Solar array not visible



Visual Analysis



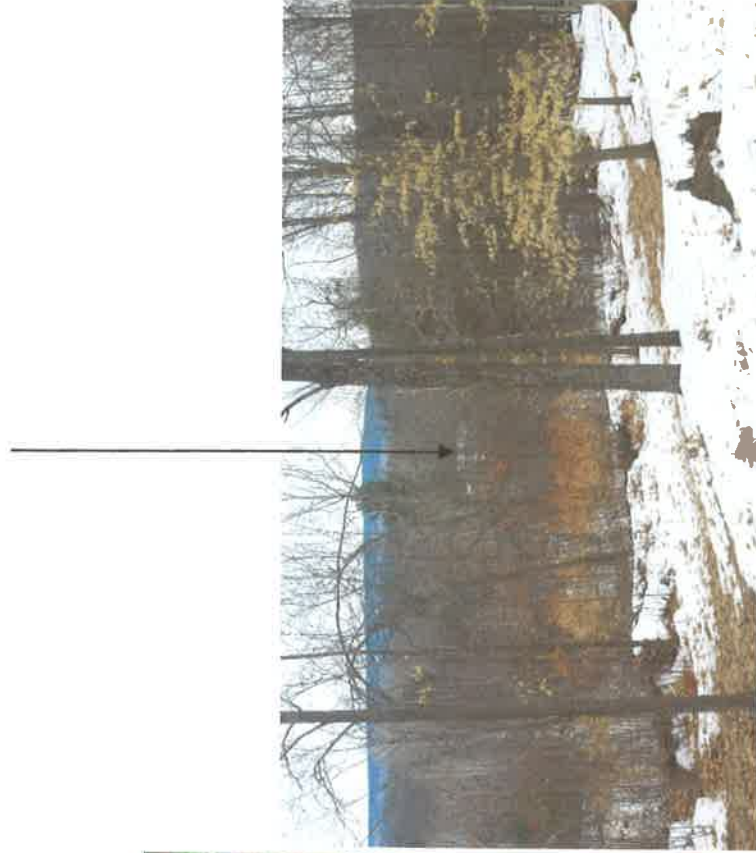
Solar array not visible



Visual Analysis



Lot not visible from array location



Visual Analysis



Solar array not visible



7-Bonner Rd

May 2015

Visual Analysis



Solar array not visible



Fencing



A few articles of interest on the fencing:

We have used "Solarscrim" for the protection of the DC wiring. It was specifically created for aesthetics. (see article at:

<http://www.solarpowerworldonline.com/2013/12/company-finds-new-way-improve-solar-aesthetics/>). "Solarscrim, which offers a solution for circuitry protection for ground-mounted solar arrays, now offers a new product. The solution, called Under the Array, provides an efficient and affordable way to install a beautiful circuitry barrier across an entire solar panel deployment, as a substitute to chain link fencing. Solarscrim's Under the Array solution meets National Electric Code (NEC) 2011 Section 690.31(A) which requires that panel circuitry not be readily accessible."

National Electric Code (quoted from HomePower): Many of the new sections in Article 690, Part IV, "Wiring Methods," were moved from other locations. There also are some new requirements. Previously, DC conductors had to be installed in raceways on arrays with a maximum voltage greater than 30 V that were installed in "readily accessible locations" (e.g., ground mounts). Now, Section 690.31(A) allows them to be guarded—"covered, shielded, fenced, enclosed, or otherwise protected...[which] removes the likelihood of approach or contact by persons or objects to a point of danger." This means that screening, some wire-management systems, or even lattice-wrapping the exposed sides and back of an array may be acceptable, rather than having to use a raceway or render the array inaccessible (such as with a fence, or by making it high enough to require a ladder). The authority having jurisdiction (AHJ) will have the final word on acceptability of individual strategies.

Vermont fire safety suggests protecting each individual solar module with protective screening, which is what we suggest. They also go on to suggest a 7 ft fence if you don't protect each module DC wiring. (

<http://firesafety.vermont.gov/sites/firesafety/files/pdff/Misc%20Forms/Solar%20Panel%20Memorandum.pdf>) "The NEC Handbook makes the following comment at this code opening: "Most PV modules do not have provisions for attaching raceways. These circuits may have to be made "not readily accessible' by use of physical barriers such as wire screening" While this may suggest a solution, it is not always practical to install physical barriers on each individual module because of the number of modules involved...."

Alternatively, in lieu of protecting each individual module, the Division will also accept protective arrangements complying with the National Electric Safety Code Section 11, 110 (a) which provides that electric supply stations may be guarded by a grounded metal fence with a height that satisfies any one of the following: a. Fence fabric, 2.13 m (7ft) or more in height. b. A combination of 1.8 m (6') or more of fence fabric and an extension utilizing three (3) or more strands of barbed wire to achieve overall height of the fence not less than 7'. c. Other types of construction, such as nonmetallic material that present equivalent barriers to climbing or other unauthorized entry...."

Approximate Price for Fencing:

5' vinyl coated chain link fence 1200', with (2) 14ft gates (each with w/2 7ft swinging gates coming together in the middle) installed. Corners and gates posts in 4 ft concrete, other posts driven to 3 ft. Approx \$20/ft or \$25k"

Wiring- "Not readily accessible"



Decommissioning Plan



- Remove modules
- Disassemble rack/cut aluminum
- Pull posts
- Remove inverter shed
- Remove electrical equipment and underground wires
- Recycle/dispose of materials
- Grade and seed areas of disturbance