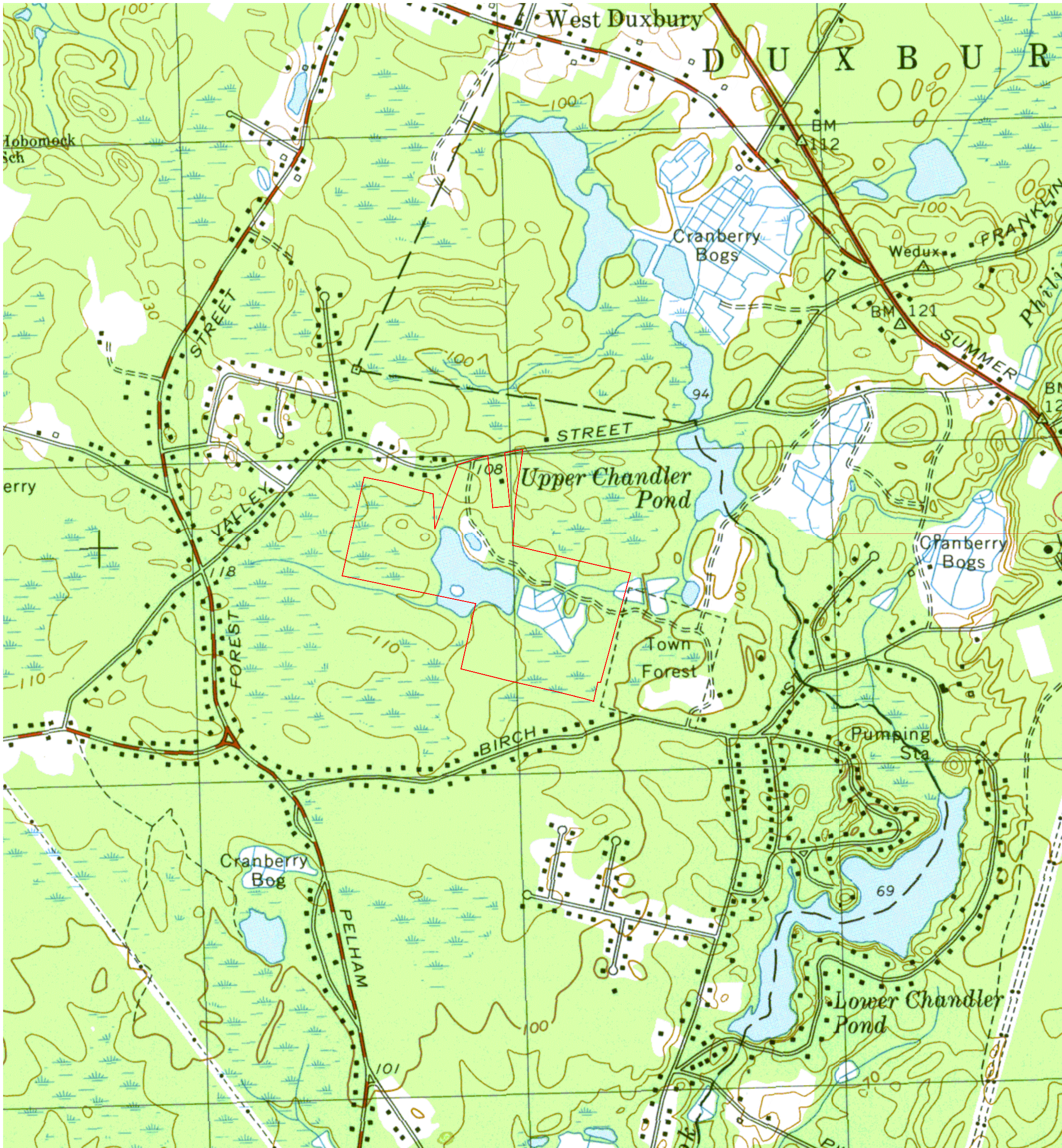


J&J FAMILY FARM AND SUNRAISE SOLAR ENERGY FACILITY  
PERMITTING PLAN SET

235 VALLEY STREET  
(ASSESSOR'S MAP F4 LOT 2)

TOWN OF PEMBROKE, MASSACHUSETTS  
APRIL 26, 2019



1 LOCUS MAP/ USGS  
LOCUS MAP SOURCE: MASSGIS DATA-USGS TOPOGRAPHIC QUADRANGLE IMAGES  
SCALE IN FEET  
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2 ORTHO-PHOTOGRAPH  
BASE MAP SOURCE: MICROSOFT DIGITALGLOBE ORTHO IMAGERY (REFERENCED NOVEMBER 2018)  
SCALE IN FEET  
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SHEET INDEX

- 1.0: COVER
- 2.0: EXISTING CONDITIONS
- 3.0: SITE PLAN-CLEARING AND EROSION CONTROL
- 4.0: SITE PLAN- SOLAR ARRAY LAYOUT
- 5.0: SITE DETAILS
- 6.0: EXISTING HYDROLOGY
- 6.1: PROPOSED HYDROLOGY

- REQUESTED WAIVERS**  
THE APPLICANT REQUESTS RELIEF FROM THE STRICT APPLICATION OF THE FOLLOWING WAVERS:
- 4.15 DEVELOPMENT IMPACT STATEMENT
  - 4.22 TRAFFIC IMPACT STUDY
  - 4.7 LANDSCAPE PLAN

Pembroke Zoning Table						
	Residential A Zone			Solar Overlay		
	Requirement	Existing	Proposed	Requirement	Existing	Proposed
Lot Size (sf)	40,000	4,878,720	Same	3 Acres	112 Acres	Same
Frontage (lf)	150	450	Same			
Front Yard Setback	40	N/A	69	50	N/A	69
Side Yard Setback	20	N/A	161	50	N/A	161
Rear Yard Setback	25	N/A	159	50	N/A	159
Height (stories)	2 1/2	N/A	< 2 1/2 (<10')			

TOWN OF PEMBROKE PLANNING BOARD

MEMBER	_____	DATE: _____
MEMBER	_____	DATE: _____
MEMBER	_____	DATE: _____
MEMBER	_____	DATE: _____
MEMBER	_____	DATE: _____
MEMBER	_____	DATE: _____

THIS SITE PLAN APPROVAL DOES NOT NECESSARILY INDICATE COMPLIANCE WITH THE PEMBROKE ZONING BY-LAW.

I, TOWN CLERK OF THE TOWN OF PEMBROKE, MA HEREBY CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE NEXT TWENTY DAYS AFTER RECEIPT AND RECORDING OF SAID NOTICE.

\_\_\_\_\_ DATE: \_\_\_\_\_

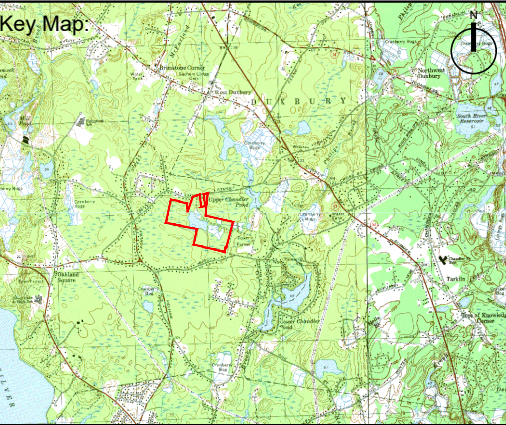
PEMBROKE TOWN CLERK

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**SWCA**  
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Prepared for:  
**VALLEY ROAD SOLAR, LLC**



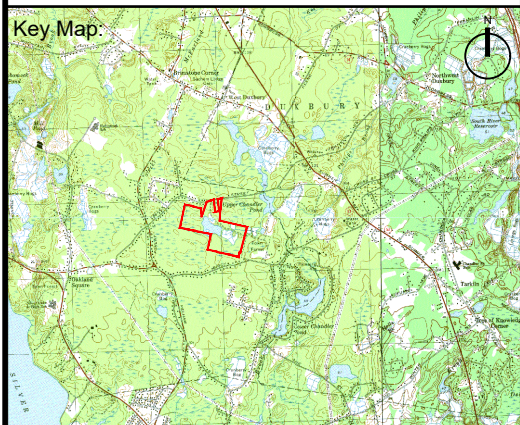
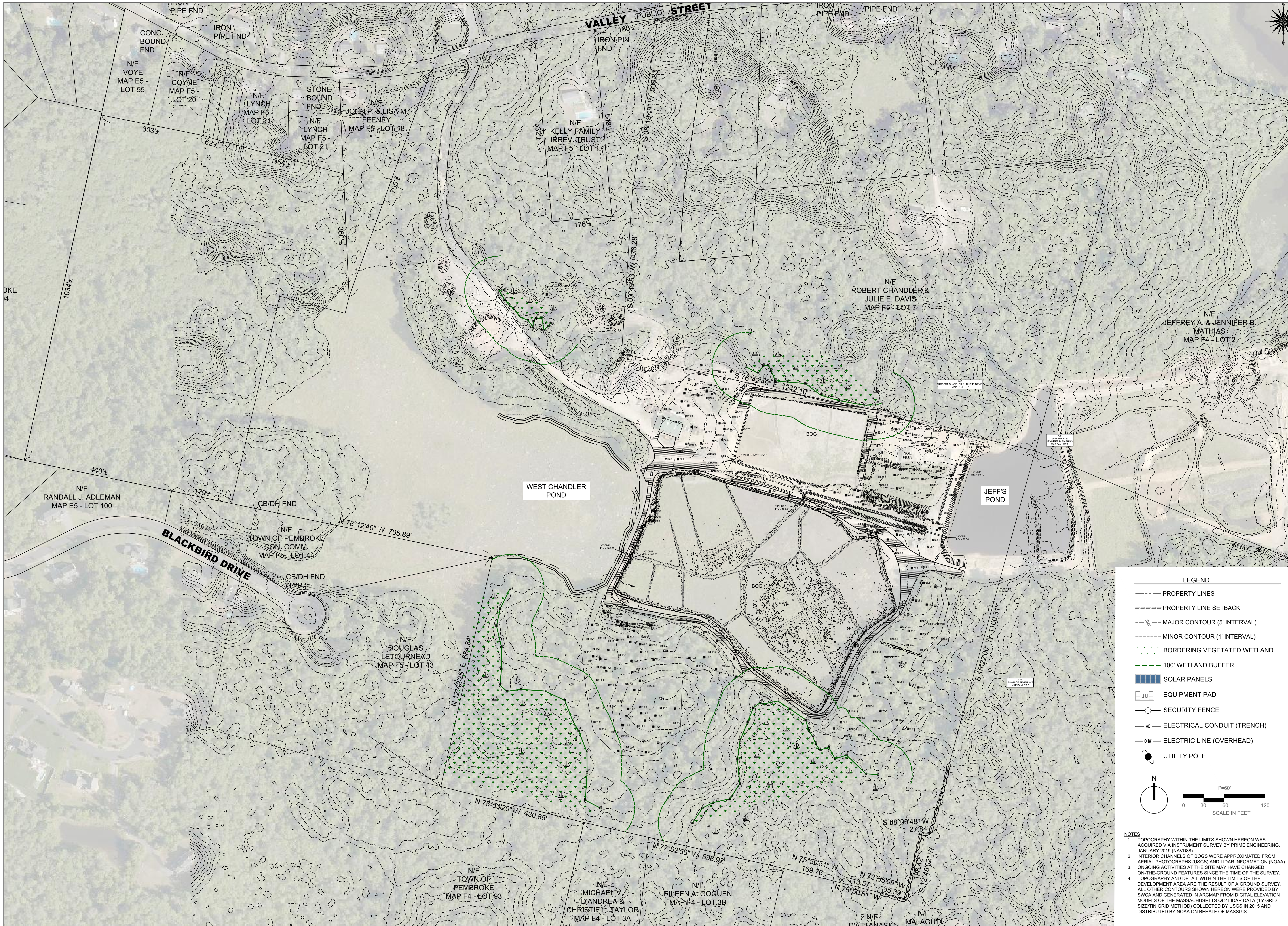
Project Title:  
**J&J FAMILY FARM AND SUNRAISE  
SOLAR ENERGY FACILITY  
PEMBROKE, MA**  
  
**235 VALLEY STREET  
(Assessor's Map F4 Lot 2)**

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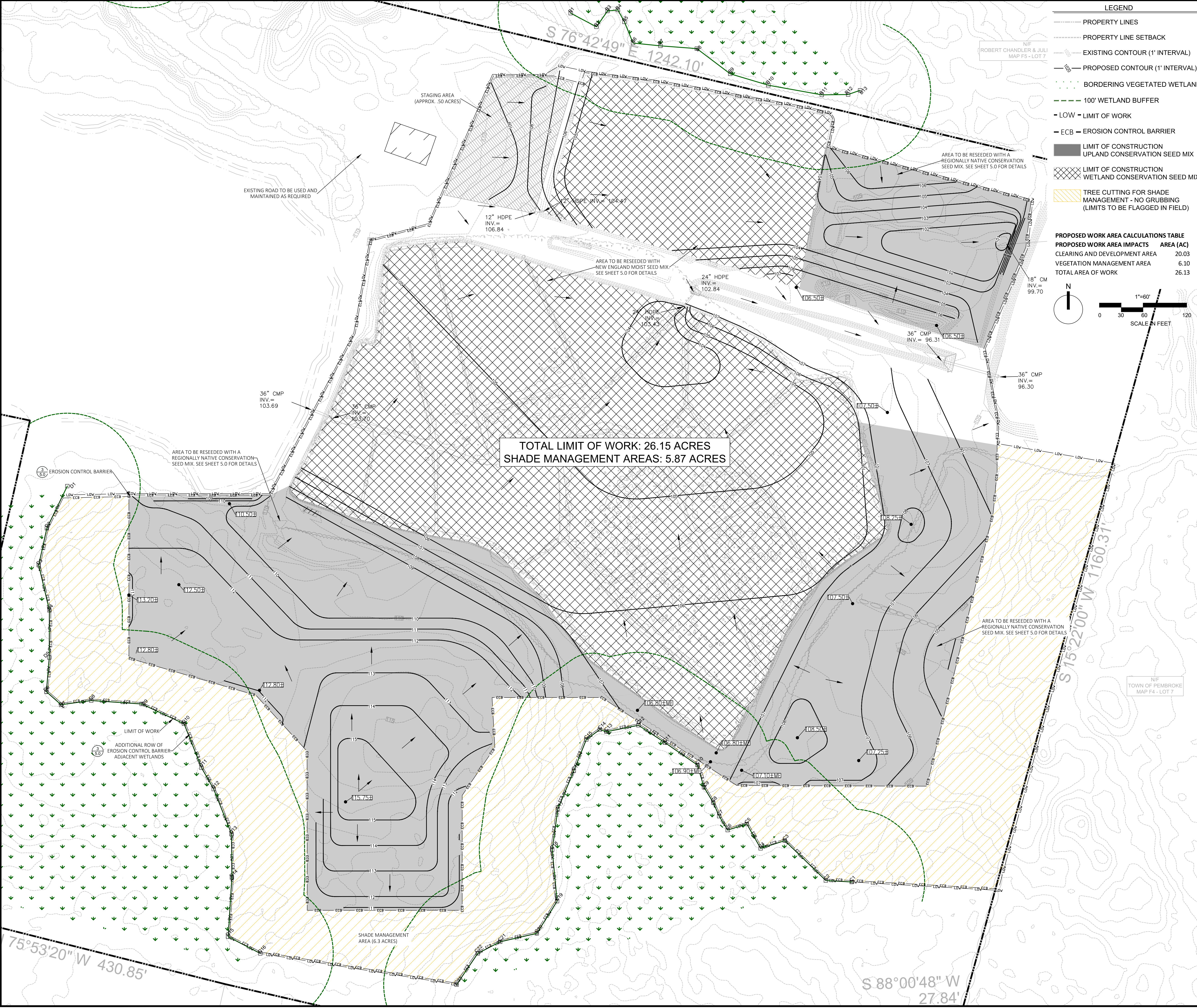
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REVISION	DATE	BY
Peer review response	06-21-19	TS

Sheet No:  
**1.0**



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File #	50506.00

REVISIONS		
REVISION	DATE	BY
Peer review response	06-21-19	TS



**LEGEND**

- PROPERTY LINES
- PROPERTY LINE SETBACK
- EXISTING CONTOUR (1' INTERVAL)
- PROPOSED CONTOUR (1' INTERVAL)
- BORDERING VEGETATED WETLAND
- 100' WETLAND BUFFER
- LOW - LIMIT OF WORK
- ECB - EROSION CONTROL BARRIER
- LIMIT OF CONSTRUCTION UPLAND CONSERVATION SEED MIX
- LIMIT OF CONSTRUCTION WETLAND CONSERVATION SEED MIX
- TREE CUTTING FOR SHADE MANAGEMENT - NO GRUBBING (LIMITS TO BE FLAGGED IN FIELD)

**PROPOSED WORK AREA CALCULATIONS TABLE**

PROPOSED WORK AREA IMPACTS	AREA (AC)
CLEARING AND DEVELOPMENT AREA	20.03
VEGETATION MANAGEMENT AREA	6.10
TOTAL AREA OF WORK	26.13

**GENERAL NOTES:**

- CIVIL DESIGN GROUP LLC'S DESIGN EFFORT WAS LIMITED TO PREPARING THE PROPOSED GRADING INCLUDING CONTOURS, SPOT SHOTS AND FLOW ARROWS AS SHOWN ON THIS PLAN AND IS BASED ON THE EXISTING CONDITIONS PLAN PREPARED BY OTHERS.
- THE ELEVATIONS SHOWN ON THIS PLAN ARE BASED ON THE DATUM REFERENCE ON THE EXISTING CONDITIONS PLAN.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND ELEVATION BENCHMARKS THROUGHOUT CONSTRUCTION.
- CONTRACTOR SHALL NOTIFY ENGINEER IF THE ILLUSTRATED GRADES CANNOT BE ACHIEVED.
- UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR SHALL PROVIDE AS-BUILT RECORDS OF ALL CONSTRUCTION (INCLUDING UNDERGROUND UTILITIES) TO THE OWNER AT THE END OF THE CONSTRUCTION.
- EXISTING TREES OUTSIDE OF THE LIMIT OF WORK SHALL BE PROTECTED DURING CONSTRUCTION.
- ALL DISTURBED AREAS OUTSIDE THE LIMIT OF WORK SHALL BE RESTORED IN KIND.
- CONTRACTOR SHALL FILL IN ALL BOG DITCHES WITHIN LIMIT OF WORK PER PROPOSED GRADES AND SHALL CREATE SMOOTH TRANSITIONS. GROUND SLOPES SHALL NOT EXCEED 10% WITHIN SOLAR ARRAY FOOTPRINT.

**GRADING AND DRAINAGE NOTES:**

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**PROPOSED CONSTRUCTION SEQUENCE**

THE SITE WILL BE PHASED TO MINIMIZE THE EXTENT OF UNSTABILIZED DISTURBANCE AREAS. A SUGGESTED PHASING IS OUTLINED BELOW:

**HOLD PRE-CONSTRUCTION MEETING WITH CONTRACTORS, REVIEW SWPPP AND COMPLIANCE REQUIREMENTS.**

**PRIOR TO CONSTRUCTION**

- STAKE LOCATION OF PERIMETER SEDIMENT CONTROL AND FLAG LIMITS OF SHADE MANAGEMENT WITH HI-VISIBILITY EXTENDED DURATION FLAGGING
- ALL BMPs IDENTIFIED ON THE PLAN AND PROTECTED RESOURCE AREAS SHALL BE STAKED BY A REGISTERED SURVEYOR AND INSPECTED BY THE PROJECT'S APPROVED EROSION CONTROL INSPECTOR PRIOR TO PROCEEDING.
- TREES WILL BE CUT, BUT NOT STUMPED, TO ALLOW FOR PERIMETER BMP INSTALLATION, NO GRUBBING IS TO OCCUR DURING TREE REMOVAL, PRIOR TO PERIMETER BMP INSTALLATION.
- ONCE BMPs ARE INSTALLED, REQUEST APPROVAL OF THEIR PLACEMENT FROM NECESSARY AGENCIES REQUIRING THEIR INSPECTION. DO NOT PROCEED WITH PHASE 1 UNTIL APPROVAL HAS BEEN OBTAINED.

**PHASE 1**

- CONSTRUCT ACCESS-TRACKING PAD AND ANY ACCESS ROAD IMPROVEMENTS
- CLEAR TREES AND REMOVE STUMPS IN CLEARING AREA, TRACK AND STABILIZE WITH TEMPORARY SEED MIX
- CUT SHADE TREES WITHIN LIMITS OF SHADE MANAGEMENT ZONE. LEAVE STUMPS INTACT.
- FELL IN PLACE OR EXTRACT WITH SMALL RUBBER TRACKED/TIRED EQUIPMENT.
- RESTORE ANY RUTS OR DISTURBANCE WITH SEED AND MULCH.
- THE PROJECT'S APPROVED EROSION CONTROL INSPECTOR SHALL INSPECT AND APPROVE PHASE 1 GRADING AND STABILIZATION PRIOR TO THE COMMENCEMENT OF PHASE 2 GRADING

**PHASE 2**

- CONSTRUCT ARRAY AREA
- TRACK AND SEED SLOPE FOLLOWING GRADING
- CLEAR TREES AND REMOVE STUMPS, TRACK AND STABILIZE WITH TEMPORARY SEED MIX
- THE PROJECT'S APPROVED EROSION CONTROL INSPECTOR SHALL INSPECT AND APPROVE PHASE 2 GRADING AND STABILIZATION PRIOR TO THE COMMENCEMENT OF PANEL INSTALLATION AND ASSOCIATED ELECTRICAL WORK

EROSION PREVENTION AND SEDIMENT CONTROL BMP'S SHALL BE INSTALLED TO MINIMIZE EROSION FROM DISTURBED SURFACES AND CAPTURE SEDIMENT ON SITE.

ANY EXPOSED SOILS SHALL BE STABILIZED WITH A COVERING OF THE FOLLOWING:

- WOOD CHIP/MULCH OR STUMP GRINDINGS
- STRAW MULCH
- TEMPORARY COVER OF RYE OR OTHER GRASS TO PREVENT EROSION AND SEDIMENTATION.
- HYDRO-MULCH APPLICATION WITH BFM (BONDED FIBER MATRIX)

CONSULT THE CONSTRUCTION PLAN, STABILIZATION NOTES AND DETAILS FOR ADDITIONAL NOTES AND SPECIFICATIONS.

\*ALL SITE WORK MUST BE IN ACCORDANCE WITH THE APPROVED PROJECT PLANS AND ASSOCIATED PERMITS.\*

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Prepared for:

**VALLEY ROAD SOLAR, LLC**

Key Map:

MA

**GRADING AND EROSION CONTROL**

Date: 04-26-2019

Scale: As Shown

Drawn by: TS

Checked by: MM

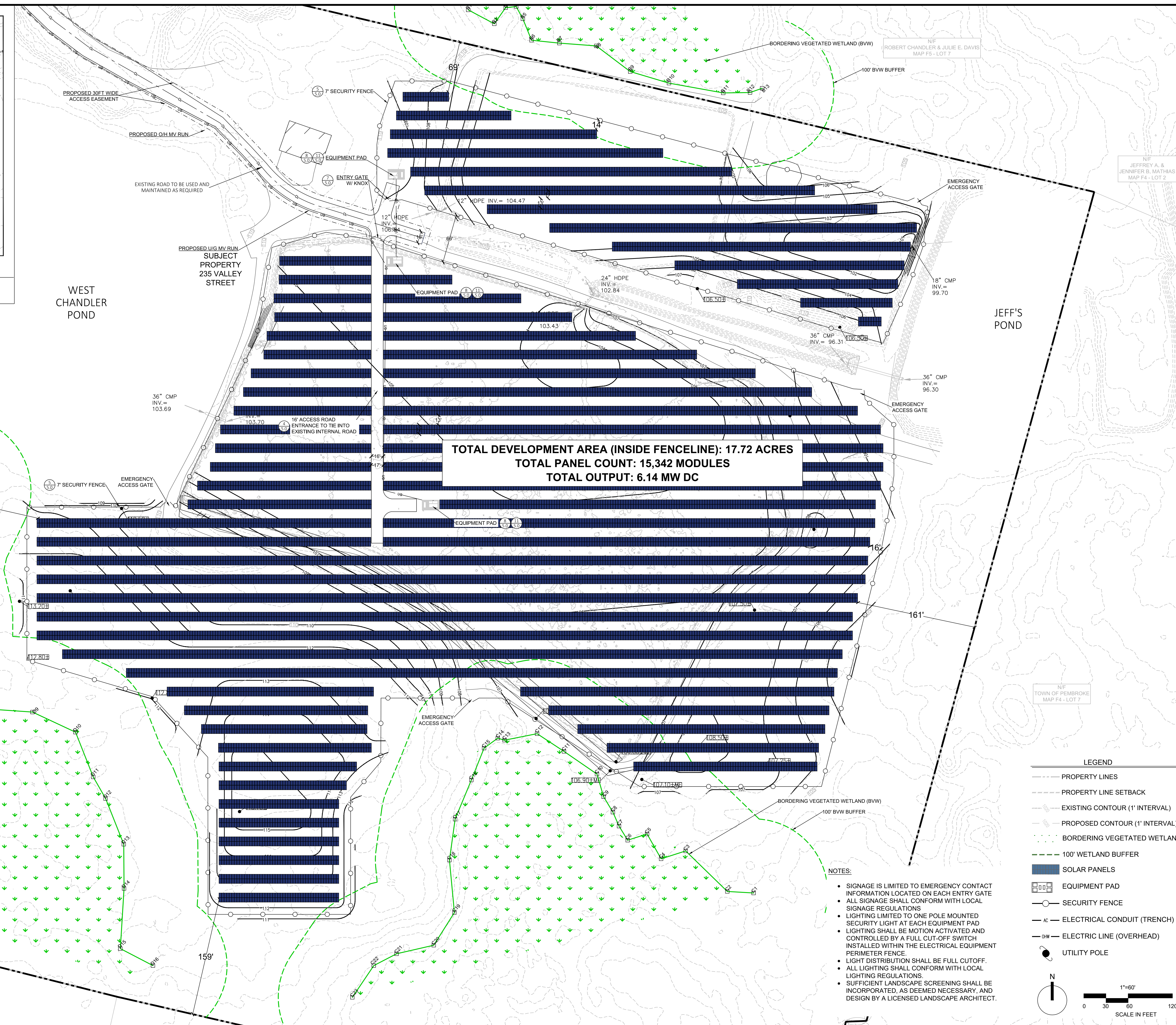
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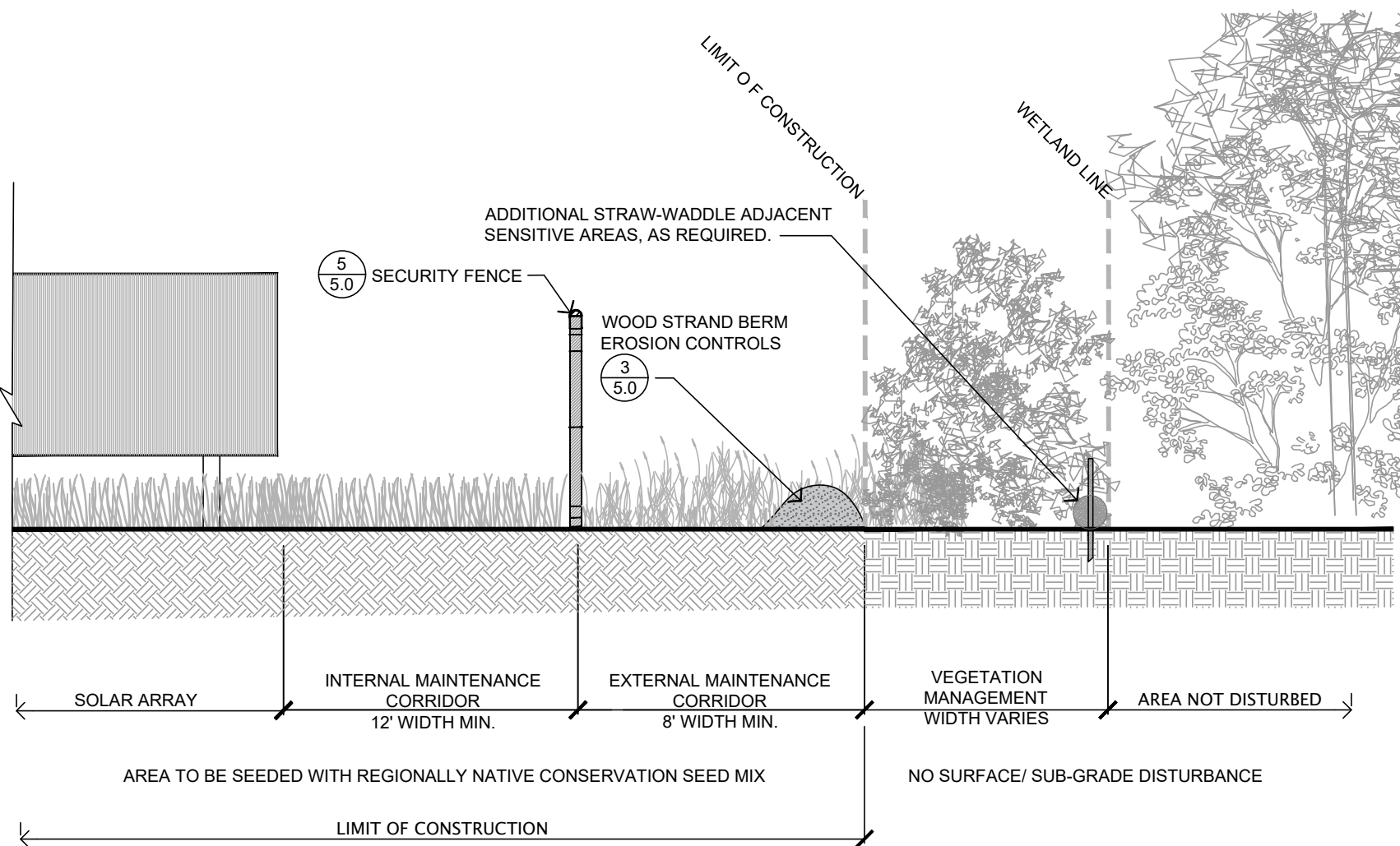
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Peer review response	06-21-19	TS

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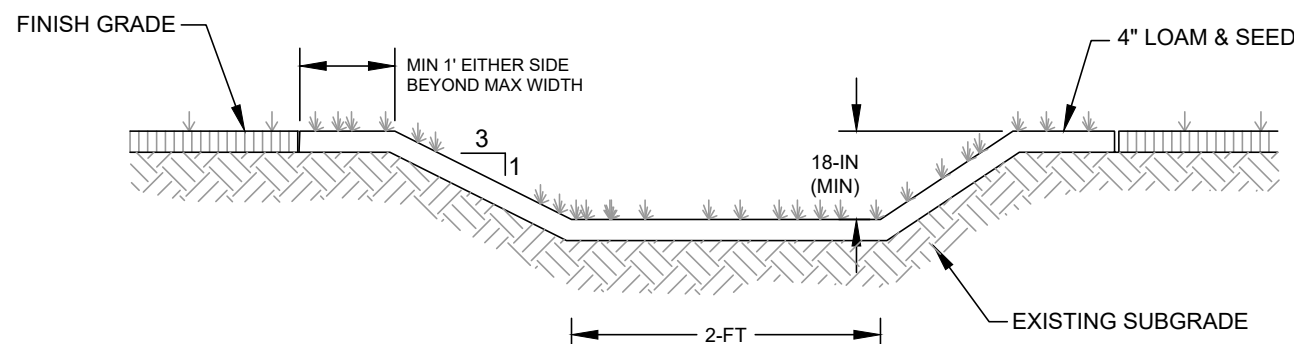
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#### 1 TYPICAL SOLAR ARRAY CROSS SECTION

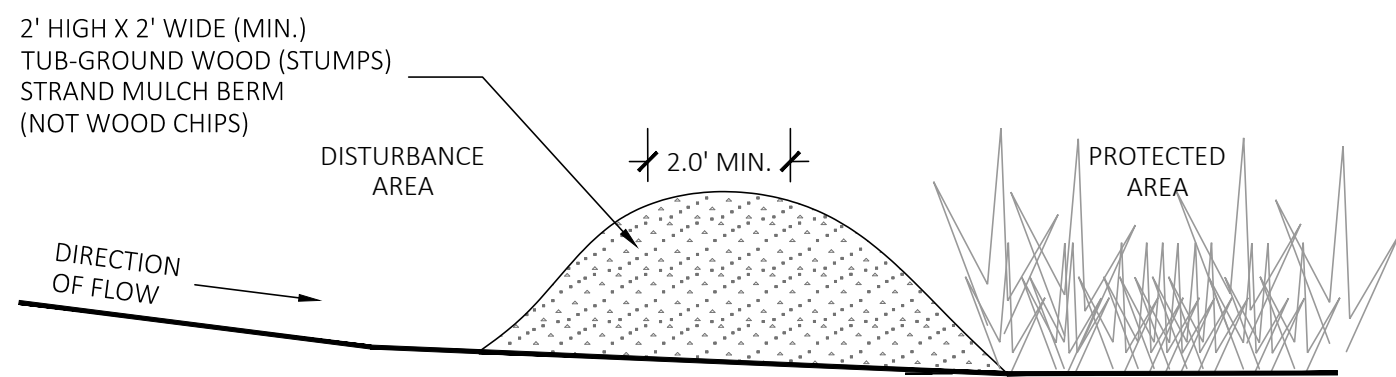
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- SWALE BOTTOM AND SIDESLOPES SHALL BE LINED WITH STRAW EROSION MAT.
- VEGETATED SWALE SHALL GENERALLY BE PLACED ON SLOPES LESS THAN 5%.
- SWALES SHALL BE STABILIZED WITH AN APPROPRIATE DEEP ROOTED GRASS MIXTURE, SEE "NEW ENGLAND MOIST MIX".
- IF FLOW CONDITIONS WARRANT, A TEMPORARY DIVERSION SHOULD BE USED TO DIVERT RUNOFF AWAY FROM THE SWALE UNTIL VEGETATION IS ESTABLISHED AND STABLE.
- ALSO SEE DETAIL 3, SHEET 5.0.

#### 2 VEGETATED SWALE

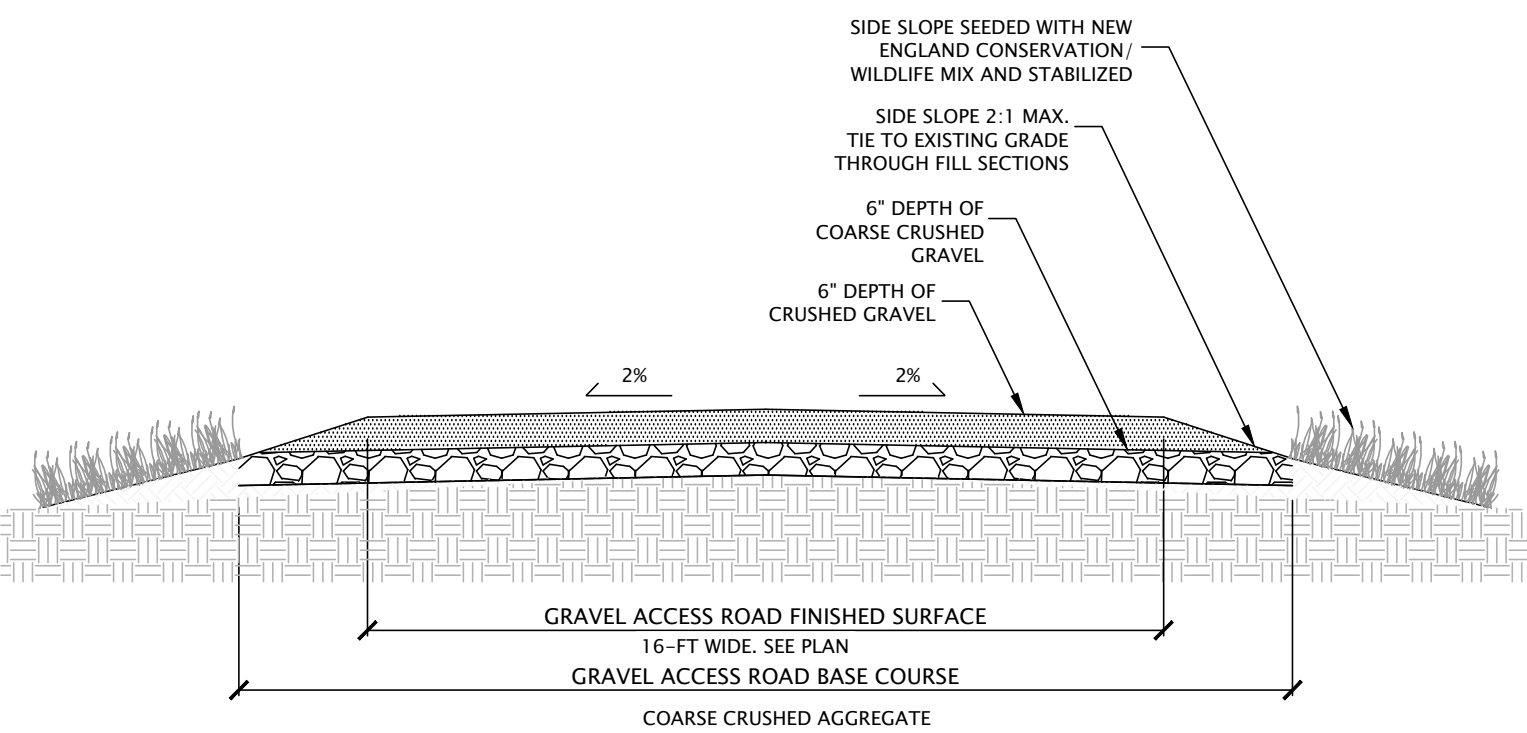
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TO BE USED WHERE SHOWN ON PLAN, AT MINIMUM, MAY BE ADDED IN OTHER LOCATIONS WHERE DEEMED APPROPRIATE.

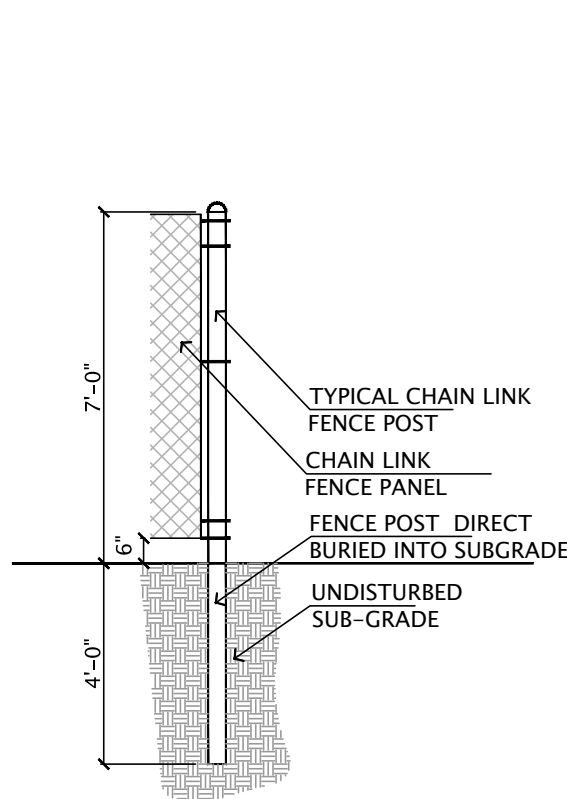
#### 3 WOOD STRAND BERM EROSION CONTROL BARRIER

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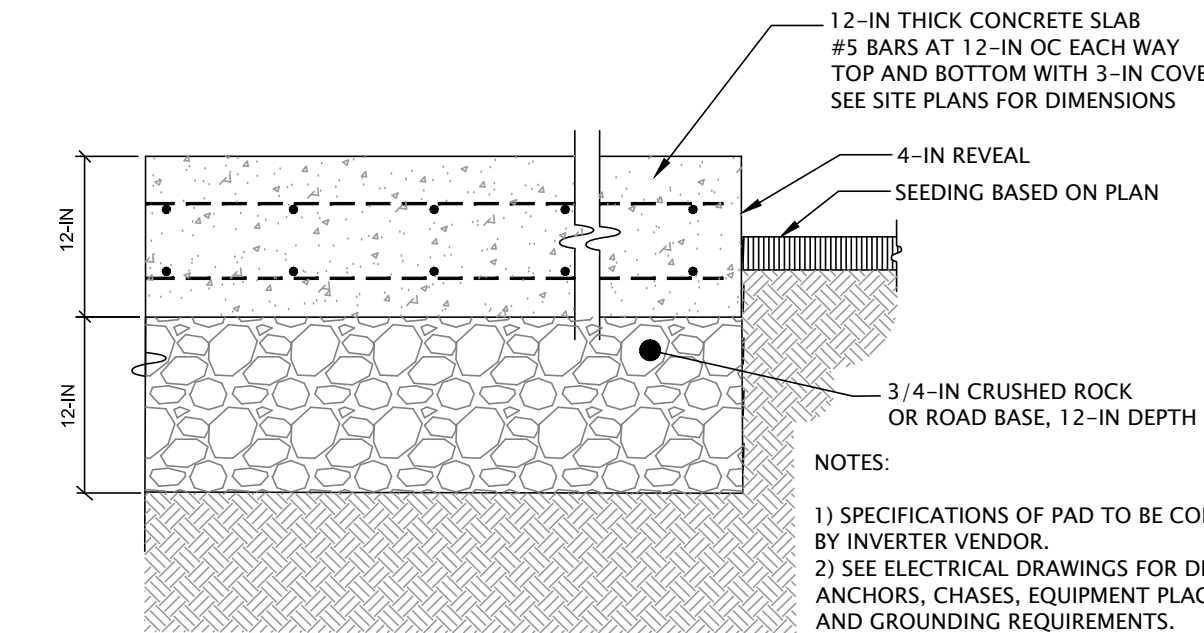
#### 4 ACCESS ROAD

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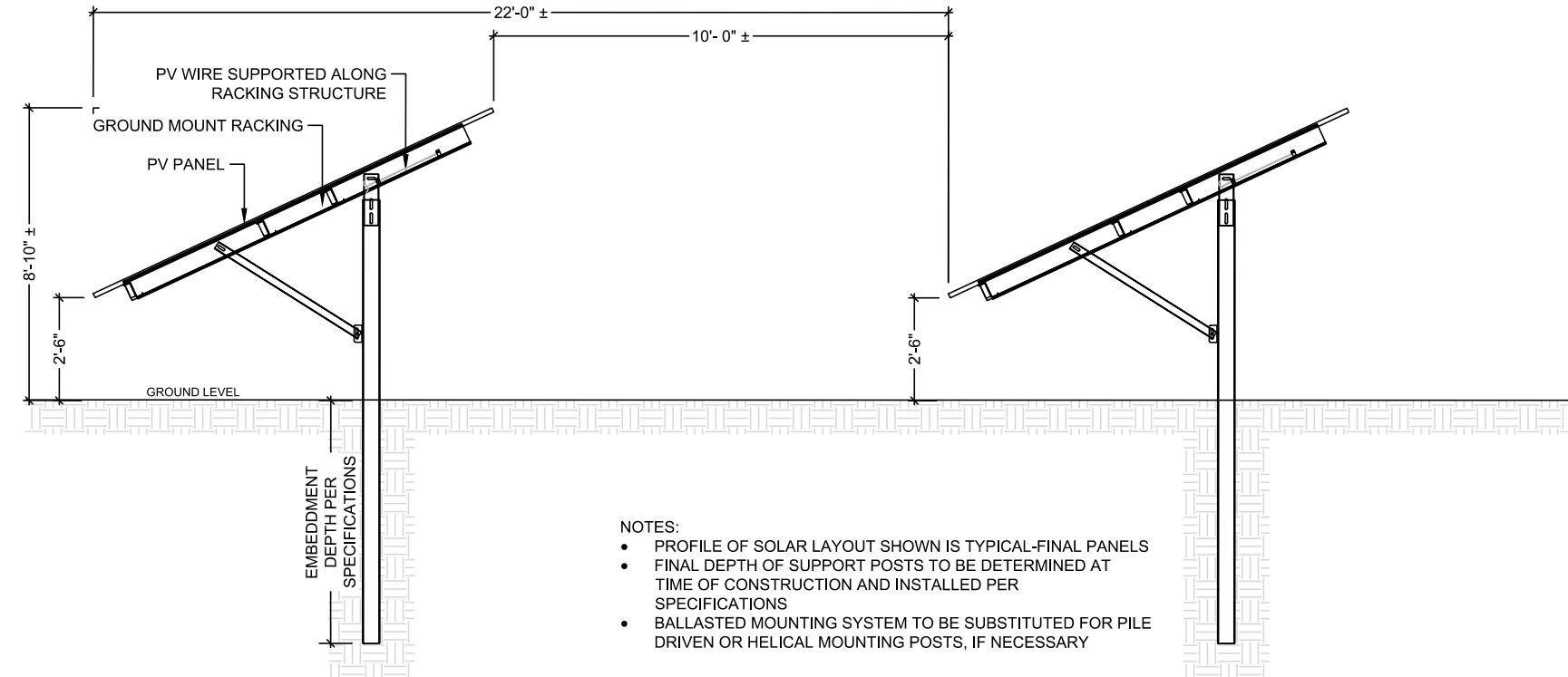
#### 5 SECURITY FENCE

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#### 8 EQUIPMENT PAD

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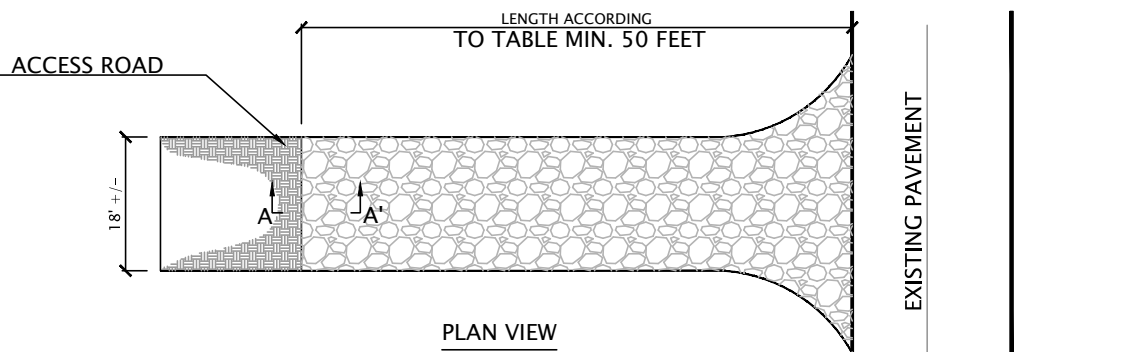


#### 9 SOLAR ARRAY PANELS (TYPICAL)

Scale: NTS

POLLINATOR / WILDFLOWER SEED MIX (CUSTOM)		
Botanical Name	Common Name	Bulk Pound (lb.)
<i>Festuca ovina</i>	Sheep Fescue	0.25
<i>Schizachyrium scoparium</i>	Little Bluestem 'Camper'	0.2
<i>Andropogon virginicus</i>	Broomsedge	0.12
<i>Lolium multiflorum</i>	Annual Ryegrass	0.15
<i>Coreopsis lanceolata</i>	Lanceleaf Coreopsis	0.08
<i>Coreopsis tinctoria</i>	Plains Coreopsis	0.08
<i>Rudbeckia hirta</i>	Blackeyed Susan	0.05
<i>Achillea millefolium</i>	Common Yarrow	0.05
<i>Aesclepias tuberosa</i>	Butterfly Milkweed	0.05

#### 10 PRESCRIBED SEED MIXES



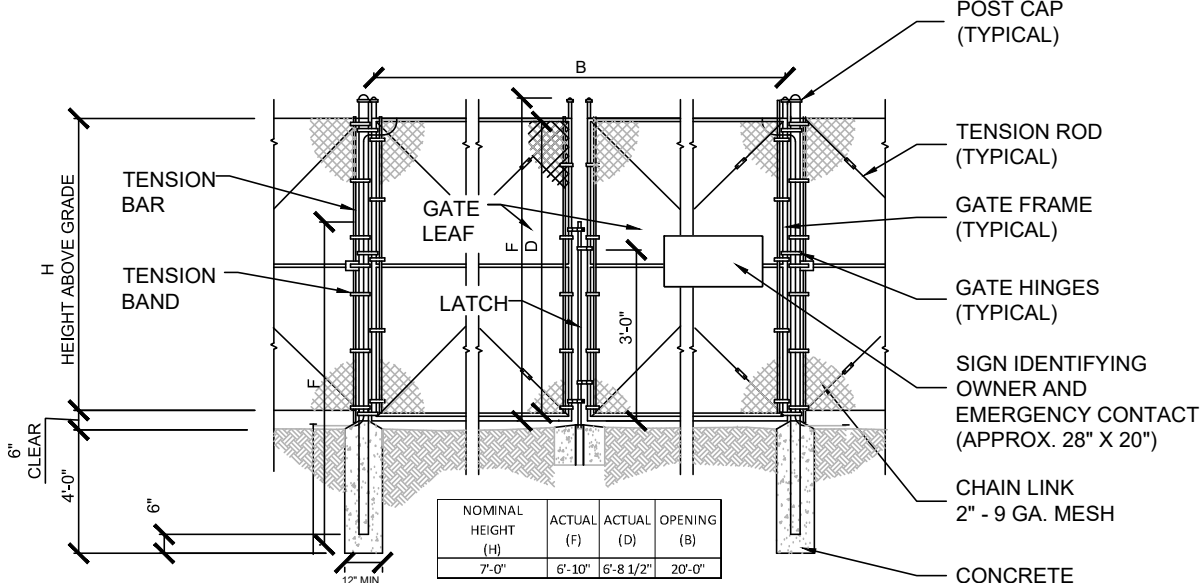
PERCENT SLOPE OF ROADWAY	LENGTH OF ROAD REQUIRED	
	COARSE GRAINED SOILS	FINE GRAINED SOILS
0 TO 2%	50 FT.	100 FT.
2 TO 5%	100 FT.	200 FT.
OVER 5%	ENTIRE SURFACE STABILIZED WITH FABRIC BASE COURSE (AS PRESCRIBED BY LOCAL ORDINANCE OR OTHER COVERING AUTHORITY)	

#### NOTES:

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY OFF-ROAD STORAGE OR STAGING AREAS. THE CONTRACTOR SHALL PROVIDE A STABILIZED CONSTRUCTION ENTRANCE FOR EACH OFF-ROAD STORAGE AREA.
- STONE SIZE TO BE 2" TO 2-1/2" DIA.
- DEPTH OF GRAVEL TO BE BASED ON SOILS BUT BE A MINIMUM DEPTH OF 3".
- THE ABOVE-INDICATED STABILIZATION CONSTRUCTION ENTRANCE TO BE USED AT OFF-SITE STORAGE OR STAGING AREA, IF REQUIRED, AND OBTAINED BY THE CONTRACTOR.

#### 6 STABILIZED CONSTRUCTION ENTRANCE

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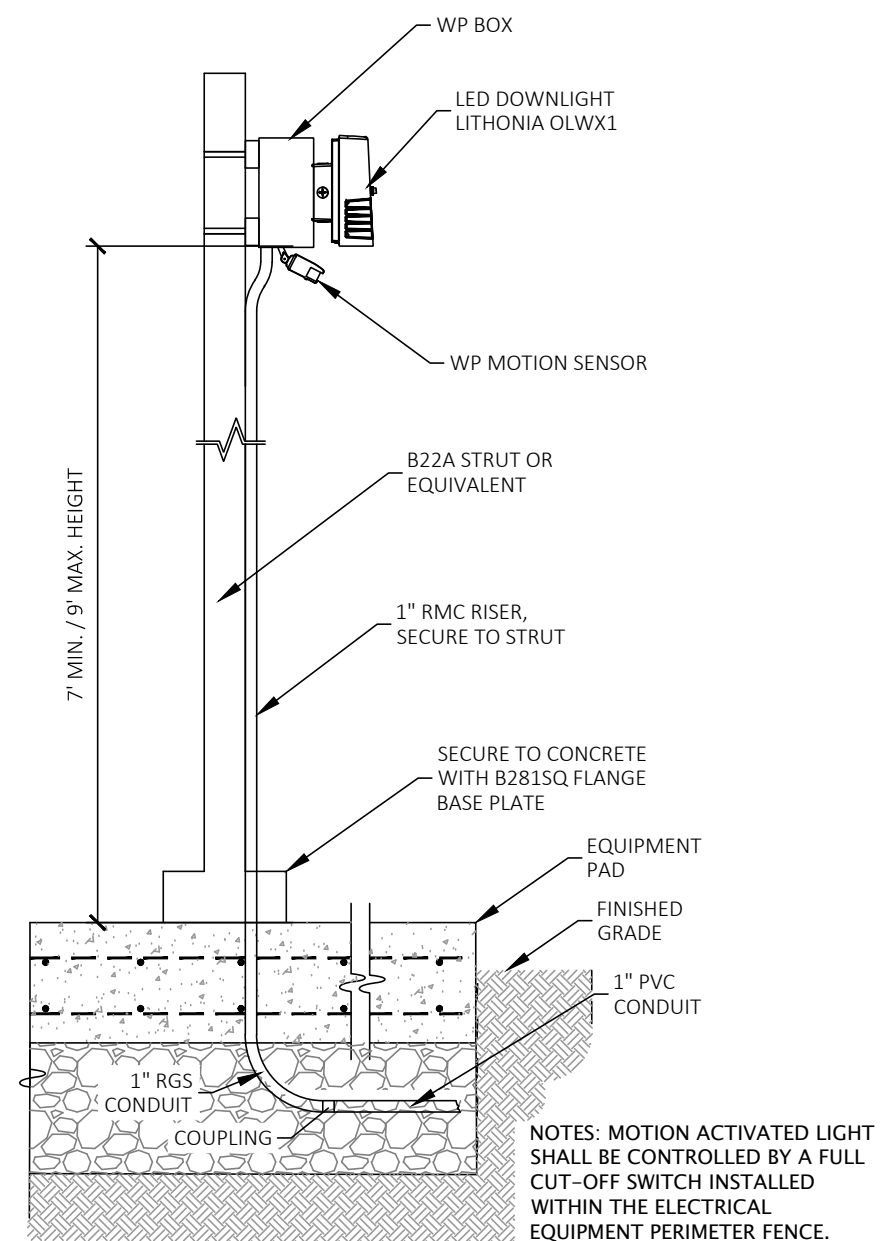


#### NOTES:

- ALL FENCING AND HARDWARE SHALL HAVE BLACK VINYL COATING
- CONCRETE ENCASEMENT AT END AND GATE POSTS ONLY
- ALL GATES AND FENCES TO HAVE 6" SEPARATION FROM BOTTOM OF CHAIN LINK FENCE TO FINISH GRADE
- EACH ENTRANCE SHALL HAVE OWNER AND EMERGENCY CONTACT SIGNAGE
- CONTACT SIGNAGE SHALL CONFORM TO MUNICIPAL SIGN STANDARDS
- AT INSTALLATION EACH ENTRANCE SHALL CONTAIN A KNOX BOX FOR EMERGENCY ACCESS

#### 7 CHAIN LINK SECURITY FENCE - DOUBLE GATE

Scale: NTS



#### 11 LIGHTING MOUNTING - DOWNLIGHT

Scale: NTS

NEW ENGLAND MOIST MIX 1LB/ 1500 SQ.FT.	
SPECIES	PERCENT
Upland Bentgrass ( <i>Agrostis perennans</i> )	32
Creeping Bentgrass ( <i>Agrostis stolonifera</i> )	16
Big Bluestem ( <i>Andropogon gerardii</i> )	15
Fox Sedge ( <i>Carex vulpinoidea</i> )	10
Canada Wild Rye ( <i>Elymus canadensis</i> )	7.5
Virginia Wild Rye ( <i>Elymus virginicus</i> )	7
Creeping Red Fescue ( <i>Festuca rubra</i> )	5.5
Soft Rush ( <i>Juncus effusus</i> )	2
Switchgrass ( <i>Panicum virgatum</i> )	1
Little Bluestem ( <i>Schizachyrium scoparium</i> )	1
Green Bulrush ( <i>Scirpus atrovirens</i> )	1
New England Aster ( <i>Aster novae-angliae</i> )	1
Spotted Joe-Pye Weed ( <i>Eupatorium maculatum</i> )	0.5
Blue Vervain ( <i>Verbena hastata</i> )	0.5
TOTAL	100

#### I. Erosion Control Plan

Erosion and sediment control methods for the site include structural and stabilization practices. Stabilization practices will be implemented to cover exposed soil so that discharge of sediment is minimized. Stabilization practices reduce the time soil is exposed to the elements therefore reducing the possibility of erosion. An adequate stockpile of erosion control materials will be maintained at the construction site in the event of an emergency or routine repairs.

Structural practices involve the construction of devices to divert and limit runoff. These practices limit the amount of storm water entering a disturbed area or trap sediment prior to storm water leaving a site. The following are the procedures to be followed:

- The site construction foreman shall be designated as the on-site individual who will be responsible for the daily maintenance of all sediment and erosion controls, and shall implement all measures necessary to control erosion and to prevent sediment from leaving the site.
- Prior to any site grading or site work, the contractor shall install all specified sediment and erosion controls, which will also serve as the limit of construction. The sediment controls will be as specified on the approved plans.
- Any work up to the wetland resource area is to have a double row of erosion control barrier. Erosion control type as shown on the plans to be field verified based on construction timing, phasing and site conditions.
- A construction exit shall be constructed to shed dirt from construction vehicle tires. The crushed stone pad will be replaced/cleaned as needed to maintain its effectiveness.
- Temporary sediment basins may be used as needed during construction. Sediment shall be removed from the basins on a as needed basis or when the sediment reaches a depth of more than 3".
- Construction debris and sediment shall be kept on site and shall not be permitted to migrate beyond the project boundaries.
- Once the site is stable, the sediment and erosion controls may be removed under the direction of the erosion control specialist.

#### II. Other Controls

The following additional controls shall be implemented during construction in order to minimize erosion and runoff from the project location:

- No chemicals (cement, mortar, etc.) shall be mixed or poured within any wetlands or buffer zone.
- Solid waste will be collected and stored in a secure dumpster. The dumpster shall meet all local and state solid waste management regulations.
- Construction debris may include lumber, concrete, steel, or other debris and site materials requiring removal. These materials will be disposed of according to state and federal law and will not be disposed of on site. Excess soil generated from this site requires characterization prior to removal. Rather than export material, it is preferred that minor excavations are reused on site as backfill in the same general area it originated.
- The limits of all grading and disturbance shall be kept to a minimum within the proposed area of construction. All areas outside the limits of disturbance shall remain undisturbed.
- Continuous lines of erosion controls shall enclose the downstream sides of the work area, these combined with up-slope markers (cons. fence and/or flagging) will serve as the limit of work.
- All erosion and sediment control measures shall be maintained or replaced as required to assure proper function.
- All breaches or failures in sediment controls shall be immediately repaired or replaced.
- Debris and litter, which accumulates along the construction area, shall be removed daily.
- Sediment build-up behind any silt fences or erosion control barriers will be monitored and removed whenever sediment has accumulated to 3-inches in depth.
- Other controls will be implemented, as deemed necessary by the contractor, during the construction of the project.
- If conditions warrant, additional de-watering controls may be needed such as dirt bags, frac tanks or other measures.

#### III. Phasing and General Construction Sequence

In order to further minimize sediment loss on the site, a general construction sequence plan has been developed. Prior to conducting work associated with this project, the contractor shall be required to obtain all copies of permit applications and approvals that outline conditions governing the proposed work. The contractor will also review the drawings prepared for the project. The contractor will then follow the general sequence of work as outlined below.

- The contractor will place all erosion and sedimentation control systems in accordance with the drawings, or as may be dictated by site conditions, in order to maintain the intent of the specifications and permits. Deficiencies or changes on the drawings shall be corrected or implemented as site conditions change. Changes during construction shall be noted and posted on the drawings (Site Plans).
- The intent is to direct all water from disturbed areas through sedimentation controls prior to leaving construction boundaries. There shall be no discharge of untreated construction runoff from this site.
- The contractor shall maintain temporary erosion and sedimentation control systems as dictated by site conditions, indicated in the construction documents, or as directed by governing authorities or owner to control sediment until final stabilization.
- The contractor shall respond to any maintenance or additional work ordered by owner or governing authorities immediately, if required, and always within 7 days.
- The contractor shall incorporate permanent erosion control features, permanent slope stabilization, and vegetation into the project plans at the earliest practical time to minimize the need for temporary controls.
- Tree and vegetation clearing and any rough grading shall only occur if the disturbed soil surface can be stabilized within 48 hours of clearing. Tree and vegetation clearing shall be scheduled in conjunction with weather forecast such that no more than 1/4" of rain is to be expected within 48 hours of any clearing or grading activity.
- Any area disturbed within the limit of work, but not within the limits of the solar array footprint are to be seeded with New England Conservation/ Wildlife Seed mix unless specified otherwise in the plan set.
- The contractor shall stabilize all disturbed areas within 48 hours after final grading. In the event that it is not practical to seed areas, slopes must be stabilized with geotextile fabric or other means to reduce the erosive potential of the area.

#### OPERATION AND MAINTENANCE PLAN

On-going access road O&M plan

- Access road may be repaired as needed to maintain access to solar facility.
- Vegetation in the access road may periodically be mown following the restrictions outlined under the vegetation maintenance plan below.

Solar Energy Equipment O&M plan

- Periodic inspections of the perimeter fence, solar array, and connecting infrastructure will be made by the maintenance contractor.
- Repairs to the security fence, including fence within the 100-foot buffer zone to wetlands, shall be made as needed.
- Erosion in access roads shall be repaired and stabilized.
- Repairs to solar energy collecting and distribution equipment shall be made as needed.
- Fence panels shall be raised approximately 6-inches off the ground to permit movement of ground dwelling animals.
- Repairs to or replacement of utility poles shall be made as needed.
- Access roads shall be maintained.
- Culverts shall be maintained as necessary, including cleaning or replacement.
- Tall vegetation surrounding the solar array will be maintained to prevent shading of the array. No vegetation within wetlands will be cut.
- Mowing will occur approximately once per year under and around the solar array.

Vegetation Maintenance plan

- Vegetation within the solar array, under and around the energy collecting panels and inside the perimeter fence, a strip of vegetation immediately outside of the fence limit, and any other location throughout the site, shall be mown annually as specified.
- Shade management by selective tree cutting shall be performed as needed.

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ENVIRONMENTAL CONSULTANTS

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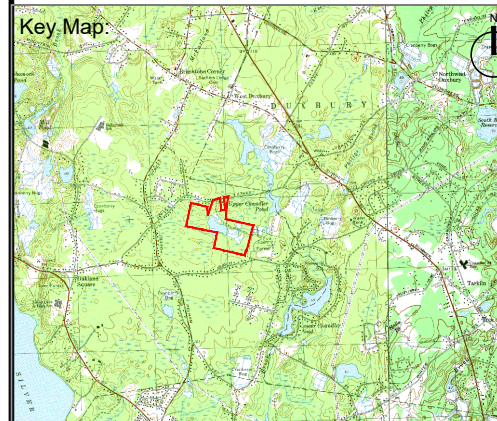
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Prepared for:

**VALLEY ROAD SOLAR, LLC**

Key Map:



Project Title:

**J&J FAMILY FARM AND SUNRAISE**  
**SOLAR ENERGY FACILITY**  
**PEMBROKE, MA**

235 VALLEY STREET  
(Assessor's Map F4 Lot 2)

Sheet Title:

#### SITE DETAILS

Date: 04-26-2019

Scale: As Shown

Drawn by: TS

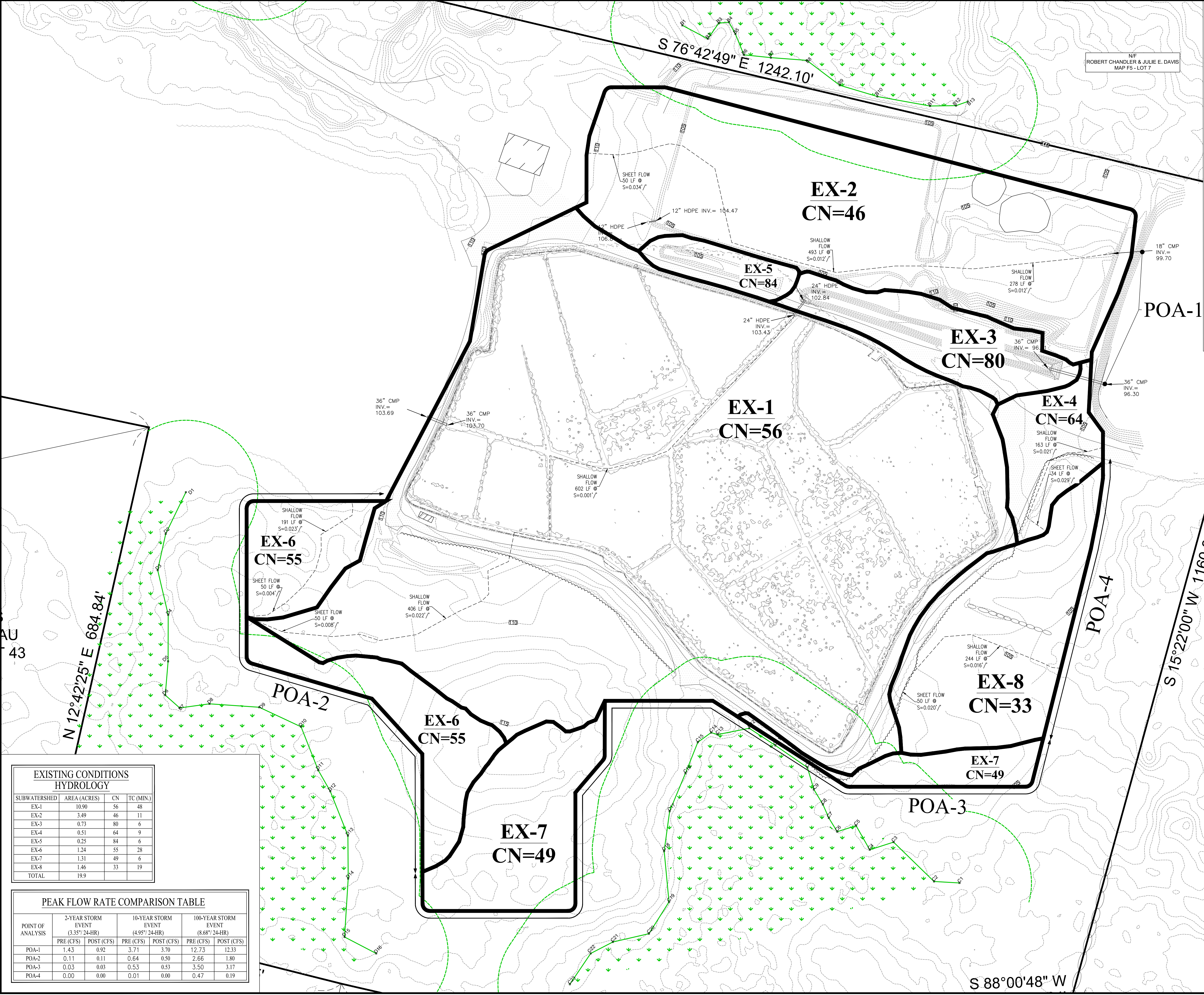
Checked by: MM

File # 50506.00

#### REVISIONS

REVISION	DATE	BY
Peer review response	06-21-19	TS

Sheet No:



LEGEND

- PROPERTY LINES
- PROPERTY LINE SETBACK
- EXISTING CONTOUR (1' INTERVAL)
- PROPOSED CONTOUR (1' INTERVAL)
- BORDERING VEGETATED WETLAND
- 100' WETLAND BUFFER
- SUBWATERSHED DIVIDE
- TIME OF CONC. FLOW PATH

GENERAL NOTES:

1. CIVIL DESIGN GROUP LLC'S DESIGN EFFORT WAS LIMITED TO DELINEATING THE WATERSHEDS, CALCULATING THE TIME OF CONCENTRATIONS, AND PREPARING HYDROLOGY CALCULATIONS AS SHOWN ON THIS PLAN AND IS BASED ON THE EXISTING CONDITIONS PLAN PREPARED BY OTHERS.

WATERSHED NOTES:

1. WATERSHED DELINEATIONS ARE BASED ON TOPOGRAPHY, DRAINAGE NETWORKS AND PHYSICAL CHARACTERISTICS.

2. POINTS OF ANALYSIS (POAs) ILLUSTRATED ON THIS PLAN ARE BASED ON THE DOWNSTREAM (OFFSET) RUNOFF DIRECTIONS OF THE ONSITE WATERSHEDS.

3. THE WATERSHEDS THAT DO NOT INCLUDE A TIME OF CONCENTRATION FLOW PATH YIELD A TRAVEL TIME OF LESS THAN 6 MINUTES. FOR MODELING PURPOSES, THE MINIMUM TRAVEL TIME OF 6 MINUTES HAVE BEEN ENTERED INTO HYDROCAD.

N

0 30 60 120

1"=60'

SCALE IN FEET

Prepared by:

**SWCA**

ENVIRONMENTAL CONSULTANTS

SWCA Environmental Consultants

15 Research Drive  
Amherst, MA 01002

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Site / Civil Engineering Prepared By:

**CIVIL DESIGN GROUP, LLC**

21 HIGH STREET, SUITE 207  
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Survey Prepared By:

**PRIME ENGINEERING, INC.**

350 BEDFORD STREET, LAKEVILLE, MA 02347  
P: 508-947-0050 F: 508-947-2004

Prepared for:

**VALLEY ROAD SOLAR, LLC**

Key Map:

EXISTING CONDITIONS HYDROLOGY				
SUBWATERSHED	AREA (ACRES)	CN	TC (MIN.)	
EX-1	10.90	56	48	
EX-2	3.49	46	11	
EX-3	0.73	80	6	
EX-4	0.51	64	9	
EX-5	0.25	84	6	
EX-6	1.24	55	28	
EX-7	1.31	49	6	
EX-8	1.46	33	19	
TOTAL	19.9			

PEAK FLOW RATE COMPARISON TABLE						
POINT OF ANALYSIS	2-YEAR STORM EVENT (3.35" 24-HR)		10-YEAR STORM EVENT (4.95" 24-HR)		100-YEAR STORM EVENT (8.68" 24-HR)	
	PRE (CFS)	POST (CFS)	PRE (CFS)	POST (CFS)	PRE (CFS)	POST (CFS)
POA-1	1.43	0.92	3.71	3.70	12.73	12.33
POA-2	0.11	0.11	0.64	0.50	2.66	1.80
POA-3	0.03	0.03	0.53	0.53	3.50	3.17
POA-4	0.00	0.00	0.01	0.00	0.47	0.19

Project Title:

J&J FAMILY FARM AND SUNRAISE SOLAR ENERGY FACILITY  
PEMBROKE, MA

235 VALLEY STREET  
(Assessor's Map F4 Lot 2)

Sheet Title:

EXISTING HYDROLOGY

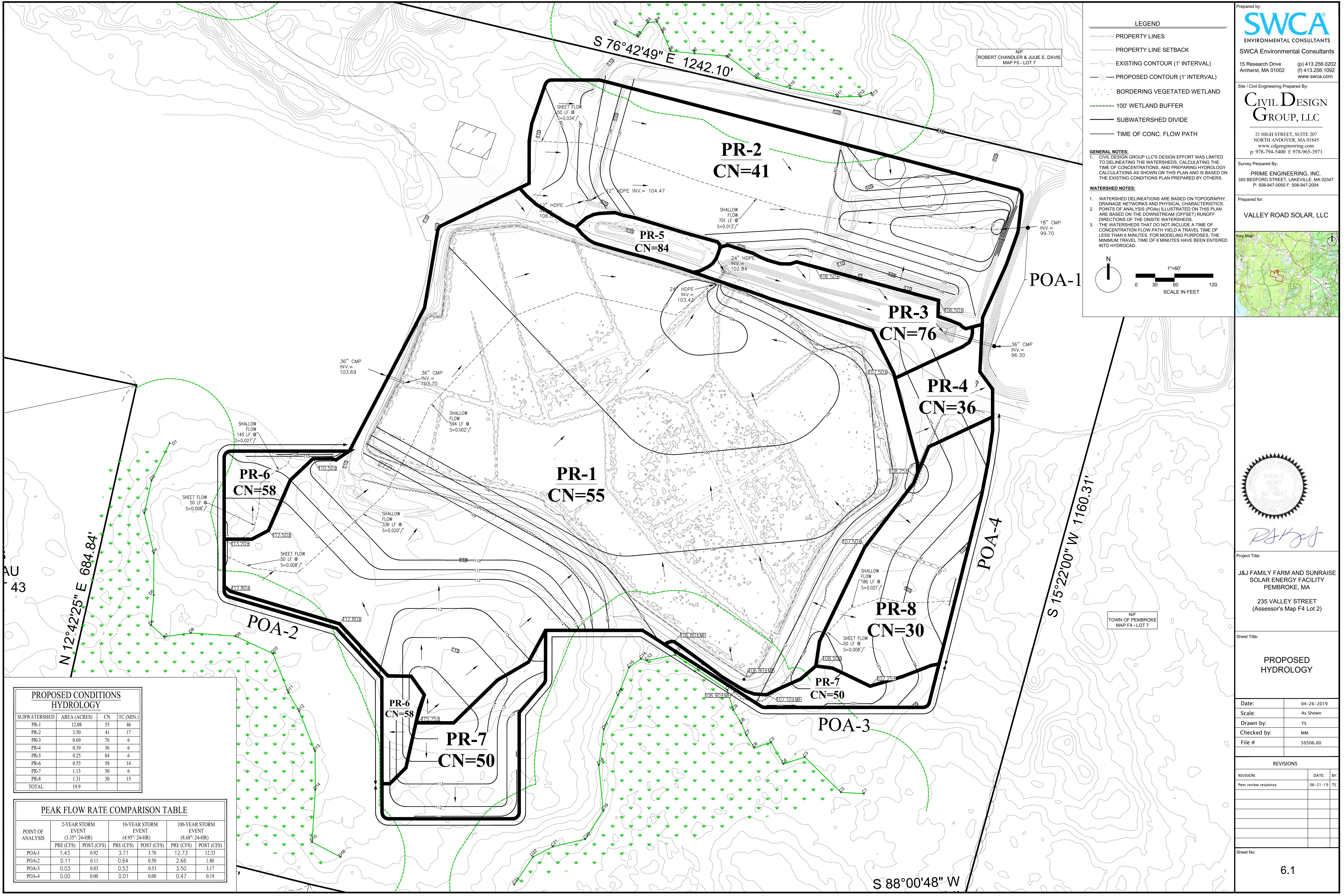
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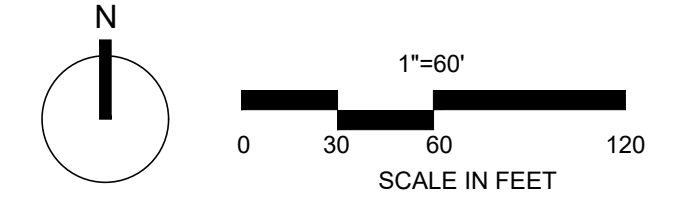


PROPOSED CONDITIONS HYDROLOGY				
SUBWATERSHED	AREA (ACRES)	CN	TC (MIN.)	
PR-1	12.08	55	46	
PR-2	3.50	41	17	
PR-3	0.69	76	6	
PR-4	0.39	36	6	
PR-5	0.25	84	6	
PR-6	0.55	58	14	
PR-7	1.13	50	6	
PR-8	1.31	30	15	
TOTAL	19.9			

PEAK FLOW RATE COMPARISON TABLE						
POINT OF ANALYSIS	2-YEAR STORM EVENT (3.35" 24-HR)		10-YEAR STORM EVENT (4.95" 24-HR)		100-YEAR STORM EVENT (8.68" 24-HR)	
	PRE (CFS)	POST (CFS)	PRE (CFS)	POST (CFS)	PRE (CFS)	POST (CFS)
POA-1	1.43	0.92	3.71	3.70	12.73	12.33
POA-2	0.11	0.11	0.64	0.50	2.66	1.80
POA-3	0.03	0.03	0.53	0.53	3.50	3.17
POA-4	0.00	0.00	0.01	0.00	0.47	0.19

- LEGEND
- PROPERTY LINES
  - PROPERTY LINE SETBACK
  - EXISTING CONTOUR (1' INTERVAL)
  - PROPOSED CONTOUR (1' INTERVAL)
  - BORDERING VEGETATED WETLAND
  - 100' WETLAND BUFFER
  - SUBWATERSHED DIVIDE
  - TIME OF CONC. FLOW PATH

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Key Map:



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**PROPOSED  
HYDROLOGY**

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**6.1**