Acheron Engineering, LLC

Engineering& Environmental & Consultants

www.AcheronEngineering.com

October 4, 2024

Evan O'Connor, Planner
Town of Windham
8 School Road
Windham, Maine 04062

RE: Sebago Solar Major Site Plan Review Follow-up Submission

Dear Evan,

First, Dave, Lucy and I would like to thank you, Steve and the planning board members for a very productive site walk and meeting last month. The purpose of this submission is to address design comments from the Town engineer, revision to address the groundwater spring, buffer yard requirements and requests from the board. Below you will find a summary of each topic and how the attached plans and documents address each item.

Engineer's Comments:
"The grading on the plan view is not precise enough to show that the road is superelevated to drain toward the meadow buffer from STA 1+00 to the end and although the cross-section shows the superelevation, it is not clear that it is toward the buffer. A suggestion would be to add compass directions (E-W) to the cross-section or A – A' to clarify."

Plan sheet C-4 has bee revised to include section designation A-A in the plan view.

"Is the proposed fence coated chain link or just galvanized? Please provide additional details."

The proposed is PVC coated solid lock fixed knot. Plan sheet D-1 has been revised to include the PVC coating specification.

Property Value:
As discussed during the board meeting this topic is a difficult nail down, due to several factors in the surrounding area of the project in addition to the proposed solar project. Attached is an informational sheet prepared by Solar Energy Industries Association summarizing the results of three studies. In addition, attached is a recent article published in the Energy News Network, a nonprofit news site, "Midwest study finds solar farms don't hurt property values and they may even boost them." The article summarizes a study performed by a Loyola University researcher.

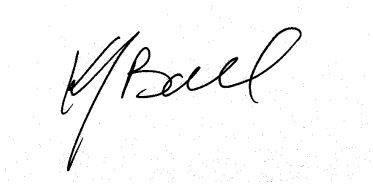
Tracker Motor Noise:
During the last meeting, noise emissions from equipment was reviewed. The lack of manufacturer specifications for tracker motors due to intermittent emissions was the focus. Since the meeting, Mainely Solar reached out to manufacturers, operators, and other developers to obtain typical sound pressure data. The manufacturer of the DuraTrack HZ tracker, Array Technologies provided noise emission data for its tracker compatible to the Sebago Solar project (attached). The data provided indicates a sound pressure level below applicable limit of 55 dBA.

Buffer Yard:
As mentioned during the last meeting the layout of the limit of the south end of the project has been moved to the north. This revision will allow for an existing vegetation buffer at the southern parcel boundary that will be a minimum of 50-feet in depth and reduce the project footprint from 11.77 acres to 10.98 acres. Please refer to the revised site plan C-2 attached. After consultation with the Town planner and planning director, the site plan and detail sheet have been revised to include buffering along the northern limits of the project.

Ground Water Spring:
Last, the plan and detail sheet has been revised to include a 75-foot long stone level spreader. The purpose of the level spreader is to intercept the spring water, prevent it from channelizing and convert to sheet flow to promote infiltration. It is important to note that discharge from the spring is not currently conveyed to an adjacent parcel. During pit operations discharge has been controlled by creating infiltration basins within the pit area.

If you have any questions, please feel free to contact me.

Respectfully Submitted,
Acheron Engineering



Kirk Ball, PE 11681

Cc: David Fowler, Sebago Solar
Lucy Fowler, Sebago Solar
Stephen Puleo, Town of Windham

ENERGY NEWS NETWORK

MIDWEST

Midwest study finds solar farms don’t hurt property values — and they may even boost them

Loyola University research looked at property values surrounding dozens of large Midwest solar farms and found a slightly positive effect, likely tied to their broader economic benefits in communities.

by **Kari Lydersen**
October 3, 2024

A solar farm near Wheatland, Wisconsin. Credit: Wikimedia Commons

A newly published study examining property values near dozens of large Midwest solar farms has found no significant negative impact — and even a slight positive effect — from the projects, according to the data.

Privacy - Terms

Loyola University researcher Gilbert Michaud has attended scores of community meetings about proposed solar projects, from the Midwest to rural France. In past research, he quantified that property values were the most common concern brought up in local hearings about proposed utility-scale solar in Europe — and he's seen similar trends in the U.S.

And while solar arrays may have an aesthetic impact, property values are influenced by a wide range of other factors, such as the quality of schools and the local economy.

"I've observed a lot of the negative comments framed as 'I think' or 'I saw something on social media,'" said Michaud, an assistant professor of environmental policy at the School of Environmental Sustainability at Loyola University Chicago. So he sought to "elevate the discussion from 'I think, I think, I think,'" by injecting it with some hard data.

His latest study, published in the December 2024 issue of the journal Solar Compass, looked at property values surrounding 70 utility-scale solar projects in the Midwest and found they actually had a minor positive effect — increasing values 0.5% to 2%.

"While the impact itself — of a few thousand dollars — might not be incredibly meaningful," said Michaud, "clearly these projects drive economic development in rural communities, through jobs, tax contributions, etcetera, which in turn increase residential property values."

Emotions running high

Michael Wildermuth, a landowner in Allen County, Ohio, was glad to hear about the proposed 300 MW Birch Solar farm, since he supports clean energy and welcomed the economic benefits. Wildermuth cofounded an organization, Allen Auglaize Coalition for Reasonable Energy (named for the two counties where the project would be sited), to advocate for the project as it faced local opposition.

"The nearest neighbors became enraged so quickly and voiced their rage so loudly that others were placed in a reactionary mode," Wildermuth said. "The neighbors were greatly concerned with property values and flooding. The landowners were afraid of these vocal neighbors, the public officials were afraid of being on the wrong side of a political 'hot potato' issue."

The developer appealed to the Ohio State Supreme Court, and Allen Auglaize Coalition for Reasonable Energy filed an amicus brief in support of the solar farm. Wildermuth wishes more data about property values had been available during the debate. He also thinks opponents ignored the $81 million the developer

estimated it would contribute to the economy, with local officials saying the project would have little local economic benefit since the power **would go to an Amazon facility.**

"Just get people 'all het up' and you don't have to deal with reason and facts," Wildermuth said.

"Do I think solar farms could actually improve property values or the financial well-being of landowners and neighbors of solar farms? Yes, I do. We argued that. We also pointed out that, in the rural area where the farm was planned, the properties would remain stable for 30 years," preventing them from being developed for other purposes that neighbors may find less desirable.

Shining new light

The study, co-authored by Loyola graduate Sampson Hao, notes that the benefits of rooftop solar on energy bills and property values are well-documented. But less is known about how utility-scale solar farms impact nearby properties — even though utility-scale solar accounts for about three-quarters of new solar development.

The study reviewed 70 solar farms built in the Midwest between 2009 and 2022, from a **database by Berkeley Laboratory** including solar farms over 5 MW. Hao and Michaud analyzed property values compiled by real estate firm Zillow, comparing values five years before a solar project became operational, with values at the operational date, which is often about two years after construction starts.

They aggregated by zip code, and controlled for factors like the COVID-19 pandemic that could affect housing values in a given year. Three-bedroom houses were used as a measure of overall property values. They also analyzed "control group" zip codes near the solar farm zip codes, but without solar farms, to account for other factors that might affect property values.

Michaud noted that while the number of bedrooms and other factors have a much larger impact on property values, the small positive impact that nearby solar farms could have could be similar to that of cultural amenities, like arts centers. Solar farms can also have an impact on schools — a major factor in determining property values — since solar projects augment local tax bases. Solar developers also often make ongoing contributions to school districts in the form of donations, supplies and energy education opportunities.

The study showed high numbers of solar farms going online in 2017 and 2021, with a smaller spike in 2020.

The projects included in the study range from a 10 MW urban installation in Chicago, installed by Exelon in 2010, to the 268 MW Riverstart Solar Park in Indiana, from 2021. Only 11 of the 70 projects studied were

over 100 MW in capacity. Indiana had the most arrays at 22, followed by 14 in Minnesota, eight in Michigan and seven in Illinois.

The most beneficial impact on property values was from solar farms between 5 and 20 MW in size, perhaps in part because these can be hidden by vegetative buffers.

"The paper is not about a house that's 200 feet away from a solar project, that's very rarely the case," said Hao, noting that developers often offer to buy properties at above market value in such situations. "We wanted to look at a bigger scale. A project between 5 and 20 MW, you're really not supposed to even see these with your bare eyes."

Midwestern focus

Michaud said that debunking myths around solar farms is particularly important in the Midwest, where there is much untapped potential for solar. While it has less sun than the Southeast and California, which have led the nation in solar farm development, the Midwest has massive stretches of agricultural land where solar can be deployed along with crops.

"This is a really important finding for Midwestern government officials, land owners, and many others to know about," Michaud said. "Many of these folks are now making decisions about whether to host a large-scale solar project in their community, and the potential impacts to property values is often something that comes up in local debates and at local hearings. Data can help tell a story and move the debate beyond anecdotal or subjective arguments."

The Loyola study cites a **2018 analysis of 956 specific solar farms** by a University of Texas researcher that found no conclusive evidence of impact on property values one way or another. The Loyola researchers also noted **a study by Berkeley Laboratory** that found about a 1% decline in property values around 2,000 solar farms in six states on the east and west coasts and in Minnesota.

"Most Midwestern states have 10 to 20 gigawatts of potential utility-scale solar in their queue, and developers are coming off of the coasts where the grid is more congested and there is less land for development, targeting agricultural land in the center of the country," Michaud said. "Finding a large plot of land with good solar irradiation and access to a substation is the sweet spot for a lot of solar developers, and in essence, positive attributes of farming crops in the Midwest are also positive attributes for farming ground-mounted, large-scale solar."

Perception becomes reality

The study notes the irony that perception plays a significant role in determining property values, and fears about property value declines can become a self-fulfilling prophecy.

“Projection and speculation drive market forces,” Michaud said. “A farmer might be angry that a solar farm is going in the community, he’s going to sell and move to Florida. A buyer thinks, ‘maybe I can negotiate this price down,’ and the house sells for less than its value, and an appraiser looks at that. But none of this is real, it’s just based on speculation and emotion, which then drives data points … it all started with an emotional response.”

Hao theorized that developers who make poor choices in siting and managing solar farms can have an impact on property values elsewhere, if negative stories about solar spread by word of mouth or social media.

“Is a developer doing their best to have as much of a buffer as economically feasible?” he asked. “Is the developer making vegetative screenings so you’re not going to see millions of panels? Is the developer doing their best to move the inverter to the center of the leased land so noise doesn’t get over the road? There’s a lot of things at the end of the day that developers can do better. It’s up to the developers to really step up their game to eliminate those potential negative effects.”

The Loyola study notes that solar developers often do things like hosting county fairs or supporting local organizations that can increase property values. Michaud said it’s possible such dynamics were reflected in their data showing small increases in property values, along with other benefits.

“From an economic perspective,” Michaud said, “locals should increasingly look at these data to understand the job opportunities, wages paid, new tax revenues and negligible or positive impacts on property values, and realize that large-scale solar projects might actually be an amenity in their community.”

Correction: An earlier version of this story incorrectly stated Michael Wildermuth planned to lease land for the Birch solar project, and that he personally filed an amicus brief in the case. The story has been updated.

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Solar and Property Value

Correcting the Myth that Solar Harms Property Value

It is a common misconception that ground mounted solar farms decrease nearby property values.

- Examining property value in states across the United States demonstrates that large-scale solar arrays often have no measurable impact on the value of adjacent properties, and in some cases may even have positive effects.
- Proximity to solar farms does not deter the sales of agricultural or residential land.
- Large solar projects have similar characteristics to a greenhouse or single-story residence. Usually no more than 10 feet high, solar farms are often enclosed by fencing and/or landscaping to minimize visual impacts.

Vegetative screening will grow to obscure panels from the road and nearby homes, when desired.
Photo Credit: Borrego Solar

The Numbers

- A study conducted across Illinois determined that the value of properties within one mile *increased* by an average of 2 percent after the installation of a solar farm.[1]
- An examination of 5 counties in Indiana indicated that upon completion of a solar farm, properties within 2 miles were an average of 2 percent *more* valuable compared to their value prior to installation.[2]
- An appraisal study spanning from North Carolina to Tennessee shows that properties adjoining solar farms match the value of similar properties that do not adjoin solar farms within 1 percent.[3]

Paired Sale Analysis: Solar Farms and Adjoining Land

	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Control Area Sales (5)	No: Not adjoining solar farm	$79.95
Adjoining Property 10 (Test Area)	Yes: Solar Farm was completed by the sale date	$82.42
Difference		3.09%

Various studies have shown that solar can potentially have a positive impact on adjoining property value. The above table references one of many in a report written by CohnReznick.[4]

[1] Kirkland, Richard C. *Grandy Solar Impact Study*. Kirkland Appraisals, 25 Feb. 2016, kirdlandapprasials.com.
[2] Lines, Andrew. "Property Impact Study: Solar Farms in Illinois." *Mcleancounty.gov*, Nexia International, 7 Aug. 2018.
[3] McGarr, Patricia. Property Value Impact Study. Cohn Reznick LLP Valuation Advisory Services, 2 May 2018.

Solar and Property Value

Harmony with Nearby Residential and Agricultural Property

1. **Appearance**: Large solar projects have similar characteristics to a greenhouse or single-story residence. Usually no more than 10 feet high, solar farms are often enclosed by fencing and/or landscaping to minimize visual impacts.

2. **Noise**: Solar projects are effectively silent. Tracking motors and inverters may produce an ambient hum that is not typically audible from outside the enclosure.

3. **Odor**: Solar projects do not produce any byproduct or odor.

4. **Traffic**: Solar projects do not attract high volumes of additional traffic as they do not require frequent maintenance after installation.

A ground-mounted solar system sited in a rural area.

Credit: Blattner

5. **Hazardous Material**: PV modules are constructed with the solar cells laminated into polymers and the minute amounts of heavy metals used in some panels cannot mix with water or vaporize into the air. Even in the case of module breakage, there is little to no risk of chemicals releasing into the environment.[5]

[5] "Clean Energy Results, Questions and Answers, Ground Mounted Solar Photovoltaic Systems." Energy Center, June 2015. http://www.mass.gov/eea/docs/doer/renewables/solar/solar-pv-guide.pdf

DuraTrack® HZ v3
with First Solar

RELIABILITY IS POWER.

THE (R)EVOLUTION IN TRACKER DESIGN CONTINUES

The latest evolution of the DuraTrack HZ v3 features an optimized interface for mounting First Solar thin-film modules. Together, these two powerhouses deliver superior energy performance and reliability to your solar plants.

THE MOST RELIABLE TRACKER UNDER THE SUN

EVOLVES FURTHER FOR SEAMLESS INTEGRATION WITH FIRST SOLAR MODULES.

GREATEST RELIABILITY.

Reducing the number of sensitive components has resulted in the highest operational uptime in the industry. Many other trackers have 166 potential failure points for every 1 in the DuraTrack HZ v3. First Solar modules also have years of proven reliability in harsh environments.

HIGHEST PERFORMANCE.

Combine the high density made possible by the DuraTrack HZ v3 with First Solar's thin film module performance advantage for winning returns. You can boost production within a tight footprint by taking advantage of up to 6% higher tracker density.

OPTIMIZED INSTALLATION.

With the fewest fasteners of any option, DuraTrack HZ v3 provides a seamless mounting solution for First Solar modules. This streamlines the most labor-intensive step, adding up to big savings. The robust mounting interface is designed and tested to withstand up to 2400 pascals.

ZERO SCHEDULED MAINTENANCE.

The tracker's gearboxes are sealed and lubricated for life, resulting in zero scheduled maintenance. All tracker rows self-calibrate twice daily, ensuring that each row is always at the optimal tracking angle. Uninterrupted module rows create a robot-ready design permitting autonomous module cleaning.

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DuraTrack® HZ v3
with First Solar

OUR EXPERIENCE. YOUR ADVANTAGE.

Array Technologies made history in 2013 with the successful integration of First Solar thin-film modules on single-axis solar trackers at the 265 MW Mt. Signal Solar. The largest thin-film solar tracking facility in North America at the time, it boasts more than three million First Solar thin-film modules mounted on a DuraTrack HZ single-axis tracking system.

THE ARRAY ADVANTAGE

Array Technologies is the worldwide leader in tracking solutions for utility and commercial solar electric generation systems, with multiple gigawatts across the globe. After more than 28 years in the industry, Array's innovations in solar tracking continue to provide the best levelized cost of electricity through reliable, easy to install and maintain systems. Array Technologies' solutions are engineered in the USA.

STRUCTURAL & MECHANICAL FEATURES/SPECIFICATIONS	
Tracking Type	Horizontal single axis
Tilt Angle	0°
kW per Drive Motor	~ 500 – 650 kW DC
String Voltage	Up to 1,500V DC
Maximum Linked Rows	Series 4 – 28 rows
Maximum Row Size	Series 4 – 240 modules
Drive Type	Rotating gear drive
Motor Type	2 HP, 3 PH, 480V AC
Motors per 1 MW AC	2 – 3, depending on module power rating and DC/AC ratio
East-West / North-South Dimensions	Site / module specific
Array Height	Series 4 – 57" standard, adjustable (49" min height above grade)
Ground Coverage Ratio (GCR)	Flexible, 32.5 – 45% typical
Modules Supported	First Solar Series 4
Tracking Range of Motion	± 52°
Operating Temperature Range	-30°F to 140°F (-34°C to 60°C)
Module Configuration	Series 4 – Four in landscape
Module Attachment	Series 4 – ATI single-fastener bracket with integrated grounding attaches to First Solar module interface bracket containing pre-installed clips
Materials	HDG steel and aluminum structural members
Allowable Wind Load (IBC 2012)	115 mph, 3-second gust exposure C, custom designs available for higher wind speeds
Wind Protection	Passive mechanical system relieves wind and obstruction damage — no power required
ELECTRONIC CONTROLLER FEATURES/SPECIFICATIONS	
Solar Tracking Method	Algorithm with GPS input
Control Electronics	MCU plus Central Controller
Data Feed	MODBUS over Ethernet to SCADA system
Night-time Stow	Yes
Tracking Accuracy	± 2° standard, field adjustable
Backtracking	Yes, optional. Deactivate to boost production
INSTALLATION, OPERATION & MAINTENANCE	
PE Stamped Structural Calculations & Drawings	Yes
On-site Training & System Commissioning	Yes
Connection Type	Fully bolted connections, no welding
In-field Fabrication Required	No
Dry Slide Bearings & Articulating Driveline Connections	No lubrication required
Scheduled Maintenance	None required
GENERAL	
Annual Power Consumption (kWh per 1 MW)	400 kWh per MW per year, estimated
Land Area Required per 1 MW	Approx. 5.75 – 6.5 acres per MWDC @ 33% GCR (site and design specific)
Energy Gain vs. Fixed-Tilt	Up to 25%, site specific
Warranty	10 year structural, 5 year drive & control components
Patent Numbers	US patent 8,459,249 US patent 9,581,678 B2 and patents pending
Codes and Standards	UL Certified (3703 & 2703)

4-pole, 50Hz, 60Hz

Pn	DRN	L_{pA}	L_{WA}	Pn	DRN	L_{pA}	L_{WA}
kW	50Hz	dB(A)		kW	60Hz	dB(A)	
0,75	DRN 80M4	48	60	0,75	DRN 80M4	49	61
1,1	DRN 90S4	51	63	1,1	DRN 90S4	51	63
1,5	DRN 90L4	54	66	1,5	DRN 90L4	54	66
2,2	DRN 100LS4	56	68	2,2	DRN 100L4	55	67
3,0	DRN 100L4	50	62	3,0	DRN 100L4	56	68
-	-			3,7	DRN 100L4	57	69
4,0	DRN 112M4	52	64	4,0	DRN 112M4	54	66
5,5	DRN 132S4	67	79	5,5	DRN 132S4	66	78
7,5	DRN 132M4	57	69	7,5	DRN 132M4	60	72
9,2	DRN 132L4	63	75	9,2	DRN 132L4	64	76
11	DRN 160M4	67	79	11	DRN 160M4	61	73
15	DRN 160L4	68	80	15	DRN 160L4	62	74
18,5	DRN 180M4	66	79	18,5	DRN 180M4	64	77
22	DRN 180L4	67	80	22	DRN 180L4	66	79
30	DRN 200L4	65	78	30	DRN 200L4	68	83
37	DRN 225S4	66	79	37	DRN 225S4	71	84
45	DRN 225M4	66	79	45	DRN 225M4	72	85
55	DRN 250M4	67	81	55	DRN 250ME4	68	82
75	DRN 280S4	66	80	75	DRN 280S4	69	83
90	DRN 280M4	65	79	90	DRN 280M4	68	82
110	DRN 315S4	71	85	110	DRN 315S4	75	89
132	DRN 315M4	71	85	132	DRN 315ME4	75	89
160	DRN 315L4	73	87	160	DRN 315L4	77	91
-	-			185	DRN 315H4	76	90
200	DRN 315H4	72	89	200	DRN 315H4	76	93

Sebago Solar

Standard motors without gear unit at rated load S1
Noise measurement according to DIN EN ISO 3744:2009

The values have a tolerance of +3 dB(A).

L_{pA} sound pressure (1m)
L_{WA} sound power

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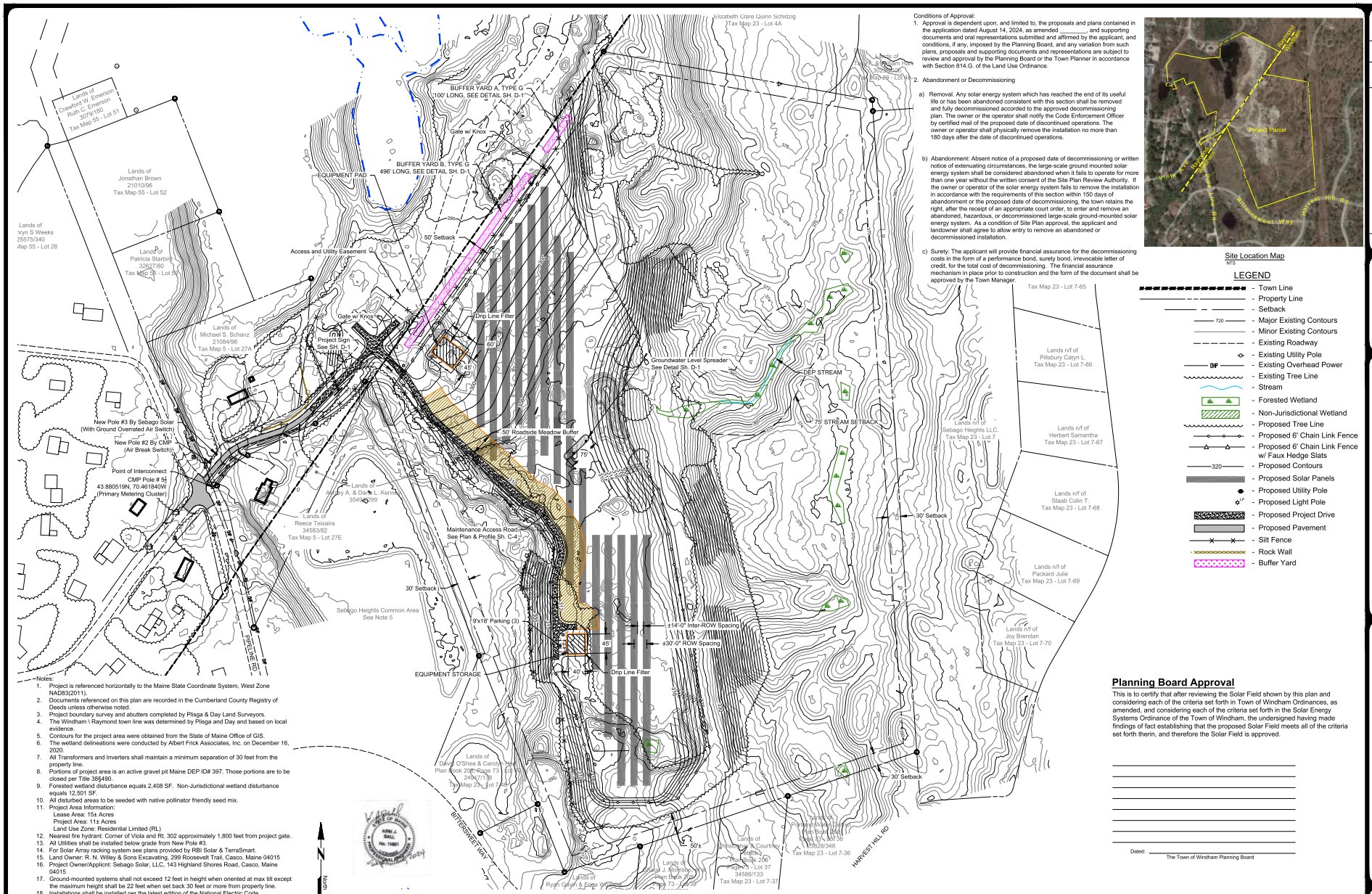


Conditions of Approval:

1. Approval is dependent upon, and limited to, the proposals and plans contained in the application dated August 14, 2024, as amended _____, and supporting documents and oral representations submitted and affirmed by the applicant, and conditions, if any, imposed by the Planning Board, and any variation from such plans, proposals and supporting documents and representations are subject to review and approval by the Planning Board or the Town Planner in accordance with Section 814.G. of the Land Use Ordinance.
2. Abandonment or Decommissioning

a) Removal. Any solar energy system which has reached the end of its useful life or has been abandoned consistent with this section shall be removed and fully decommissioned accorded to the approved decommissioning plan. The owner or the operator shall notify the Code Enforcement Officer by certified mail of the proposed date of discontinued operations. The owner or operator shall physically remove the installation no more than 180 days after the date of discontinued operations.

b) Abandonment: Absent notice of a proposed date of decommissioning or written notice of extenuating circumstances, the large-scale ground mounted solar energy system shall be considered abandoned when it fails to operate for more than one year without the written consent of the Site Plan Review Authority. If the owner or operator of the solar energy system fails to remove the installation in accordance with the requirements of this section within 150 days of abandonment or the proposed date of decommissioning, the town retains the right, after the receipt of an appropriate court order, to enter and remove an abandoned, hazardous, or decommissioned large-scale ground-mounted solar energy system. As a condition of Site Plan approval, the applicant and landowner shall agree to allow entry to remove an abandoned or decommissioned installation.

c) Surety: The applicant will provide financial assurance for the decommissioning costs in the form of a performance bond, surety bond, irrevocable letter of credit, for the total cost of decommissioning. The financial assurance mechanism in place prior to construction and the form of the document shall be approved by the Town Manager.

Site Location Map
NTS

LEGEND

- Town Line
- Property Line
- Setback
- Major Existing Contours
- Minor Existing Contours
- Existing Roadway
- Existing Utility Pole
- Existing Overhead Power
- Existing Tree Line
- Stream
- Forested Wetland
- Non-Jurisdictional Wetland
- Proposed Tree Line
- Proposed 6' Chain Link Fence
- Proposed 6' Chain Link Fence w/ Faux Hedge Slats
- Proposed Contours
- Proposed Solar Panels
- Proposed Utility Pole
- Proposed Light Pole
- Proposed Project Drive
- Proposed Pavement
- Silt Fence
- Rock Wall
- Buffer Yard

Notes:

1. Project is referenced horizontally to the Maine State Coordinate System, West Zone NAD83(2011).
2. Documents referenced on this plan are recorded in the Cumberland County Registry of Deeds unless otherwise noted.
3. Project boundary survey and abutters completed by Plisga & Day Land Surveyors.
4. The Windham \ Raymond town line was determined by Plisga and Day and based on local evidence.
5. Contours for the project area were obtained from the State of Maine Office of GIS.
6. The wetland delineations were conducted by Albert Frick Associates, Inc. on December 16, 2020.
7. All Transformers and Inverters shall maintain a minimum separation of 30 feet from the property line.
8. Portions of project area is an active gravel pit Maine DEP ID# 397. Those portions are to be closed per Title 38§490.
9. Forested wetland disturbance equals 2,408 SF. Non-Jurisdictional wetland disturbance equals 12,501 SF.
10. All disturbed areas to be seeded with native pollinator friendly seed mix.
11. Project Area Information:
    Lease Area: 15± Acres
    Project Area: 11± Acres
    Land Use Zone: Residential Limited (RL)
12. Nearest fire hydrant: Corner of Viola and Rt. 302 approximately 1,800 feet from project gate.
13. All Utilities shall be installed below grade from New Pole #3.
14. For Solar Array racking system see plans provided by RBI Solar & TerraSmart.
15. Land Owner: R. N. Willey & Sons Excavating, 299 Roosevelt Trail, Casco, Maine 04015
16. Project Owner/Applicnt: Sebago Solar, LLC, 143 Highland Shores Road, Casco, Maine 04015
17. Ground-mounted systems shall not exceed 12 feet in height when oriented at max tilt except the maximum height shall be 22 feet when set back 30 feet or more from property line.
18. Installations shall be installed per the latest edition of the National Electric Code.
19. Prior to operation, electrical connections must be inspected and approved by the Electrical Inspector.
20. The project shall be maintained as nessary to ensure that it is operating safely and as design over its useful lifetime.
21. Native pollinator friendly seed mitures shall be used to the greatest extent possible.

Planning Board Approval

This is to certify that after reviewing the Solar Field shown by this plan and considering each of the criteria set forth in Town of Windham Ordinances, as amended, and considering each of the criteria set forth in the Solar Energy Systems Ordinance of the Town of Windham, the undersigned having made findings of fact establishing that the proposed Solar Field meets all of the criteria set forth therin, and therefore the Solar Field is approved.

Dated: _____

The Town of Windham Planning Board

0 100 200 300

Scale: 1" : 100'

FOR REGULATORY REVIEW
DO NOT USE FOR CONSTRUCTION

No.	Revision Description	Drwn	Chk'd	Date
A	2024 Revisions 5MW reduced to 2.5MW	KJB	CJB	8/14/24
B	Revise southern project limit, added GW level spreader & northern Buffer Yard	KJB	CJB	10/2/24

Drwn By: BPG / KJB
Desg By: BPG / KJB
Chkd By: KJB
Aprvd By: KJB
Date: 08-14-24

ACHERON ENGINEERING, LLC
Engineering & Environmental Consultants
www.AcheronEngineering.com
320 Gorgan Road
Benton, ME. 04901
(207)341-2590
153 Main St.
Newport, ME. 04953
(207)-368-5700

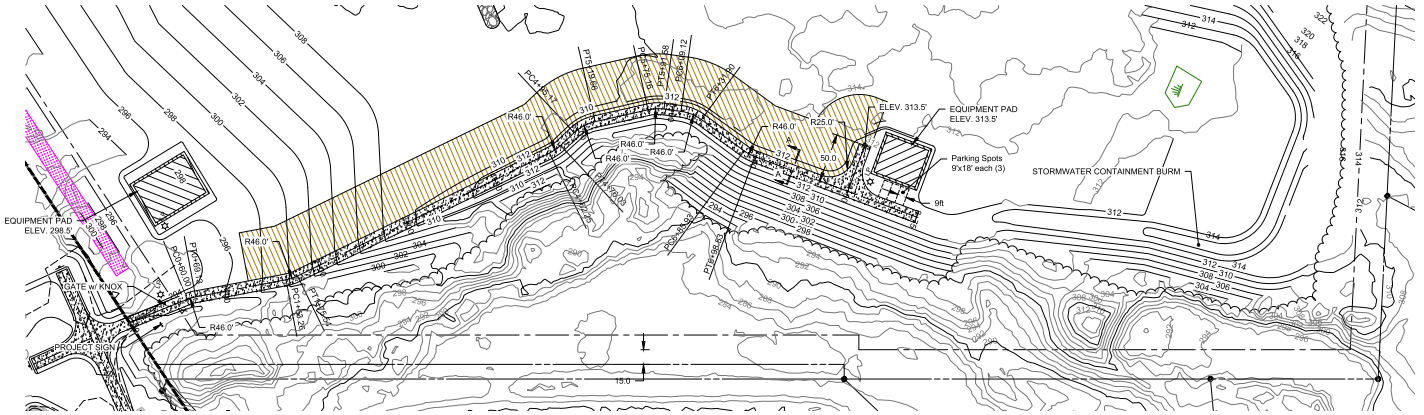
Proposed Conditions Site Plan & Erosion / Sedimentation Control Plan

Sebago Solar, LLC
Cumberland County
9 Maisie Drive - Raymond, Maine

Job Number: 80930

Drawing No: C-2

Sheet 3 of 8

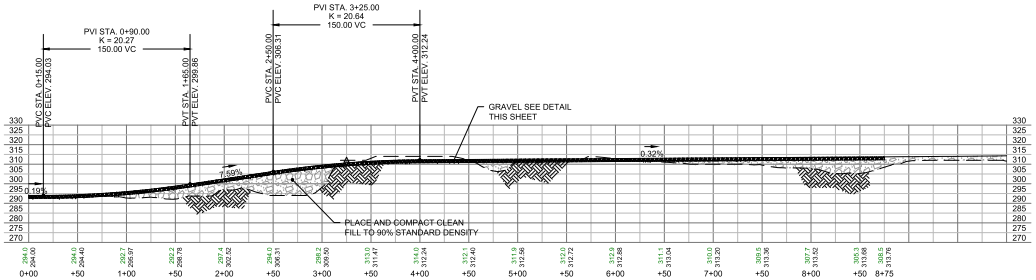


MAINTENANCE ACCESSDRIVE PLAN

SCALE: 1" : 60'

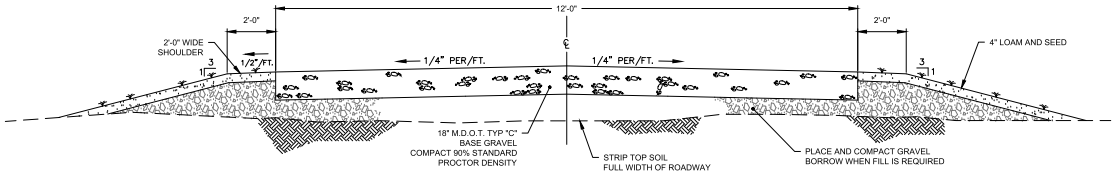
LEGEND

- Town Line
- Property Line
- Setback
- Major Existing Contours
- Minor Existing Contours
- Existing Roadway
- Existing Utility Pole
- Existing Overhead Power
- Stream
- Forested Wetland
- Proposed Fence
- Proposed Contours
- Proposed Solar Panels
- Proposed Utility Pole
- Proposed Project Drive



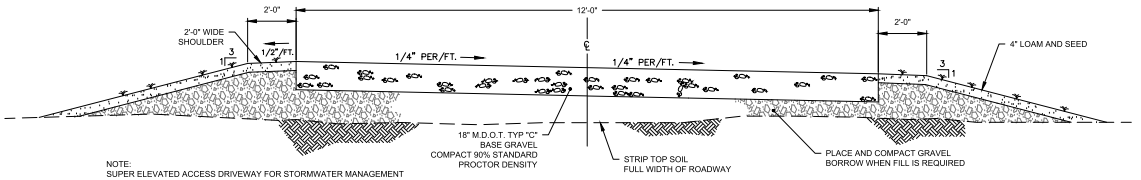
MAINTENANCE ACCESS DRIVE PROFILE

SCALE: Horz. Scale = 1:60
Vert. Scale = 1:30



TYPICAL ACCESS DRIVEWAY

SCALE: NTS



NOTE:
SUPER ELEVATED ACCESS DRIVEWAY FOR STORMWATER MANAGEMENT SHALL BE CONSTRUCTED BETWEEN STA. 1+00 TO THE END OF THE ACCESS DRIVEWAY.

ACCESS DRIVEWAY SECTION A-A

SCALE: NTS

STATE OF MAINE
KIRK J. BALL
No. 11661
LICENSED
PROFESSIONAL ENGINEER
2024

FOR REGULATORY REVIEW
DO NOT USE FOR CONSTRUCTION

No.	Revision Description	Drwn	Chk'd	Date
B	Added Cross Section designation A-A	KJB	KJB	10-02-24
A	Revised Project from SWM to 2 SWM	KJB	KJB	8-14-24

Drwn By: BPC
Desg By: BPC / KJB
Chkd By: KJB
Aprvd By: KJB
Date: 08-14-24

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Engineering & Environmental Consultants
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(207)941-2590
153 Main St.
Newport, ME. 04953
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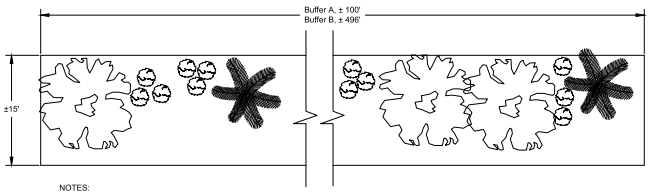
Maintenance Access Drive
Plan & Profile

Sebago Solar, LLC
Cumberland County
9 Maisie Drive - Windham, Maine

Job Number:
80930

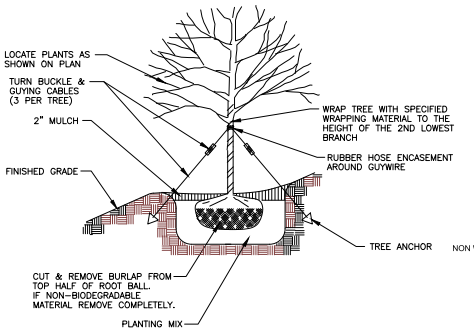
Drawing No:
C-4

Sheet 5 of 8

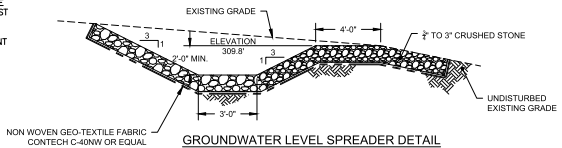


NOTES:
1. BUFFER A, TREE & SHRUB COUNT:
   2 CANOPY TREES
   1 UNDERSTORY TREES
   4 SHRUBS
   BUFFER B, TREE & SHRUB COUNT:
   9 CANOPY TREES
   3 UNDERSTORY TREES
   30 SHRUBS
2. MINIMUM TREE SIZE 6-FEET OR 2-INCHES IN CALIPER.
3. 50% OF TREES SHALL BE LOCALLY ADAPTED NATURAL EVERGREEN SPECIES.
4. MINIMUM MATURE TREE HEIGHT: CANOPY= 30-FEET, UNDERSTORY = 15-FEET.
5. MINIMUM SHRUB HEIGHT: 18-INCHES
6. 50% OF SHRUBS MATURE HEIGHT = 5-FEET WITHIN 5-YEARS.
7. 50% OF SHRUBS SHALL BE LOCALLY ADAPTED NATURAL EVERGREEN SPECIES.

BUFFER YARD DETAIL
SCALE: NTS

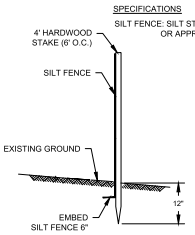


TREE STAKING DETAIL
NOT TO SCALE

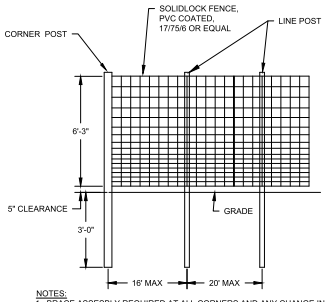


GROUNDWATER LEVEL SPREADER DETAIL
NOT TO SCALE

NOTE:
INSPECTIONS BY A PROFESSIONAL ENGINEER SHALL CONSIST OF WEEKLY VISITS TO THE SITE TO INSPECT EACH LEVEL SPREADERS CONSTRUCTION, STONE BERM MATERIAL AND PLACEMENT, SETTLING BASIN FROM INITIAL GROUND DISTURBANCE TO FINAL STABILIZATION OF THE LEVEL SPREADER.

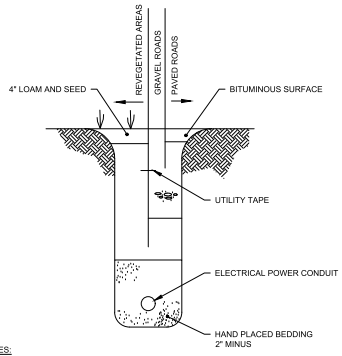


SILT FENCE DETAIL
NOT TO SCALE



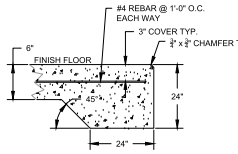
NOTES:
1. BRACE ASSESBLY REQUIRED AT ALL CORNERS AND ANY CHANGE IN DIRECTION.
2. POSTS- WOODEN & TRATED.
3. ATTACH FENCE WITH DOUBLE BARBED GALVANIZED STAPLES.

TYPICAL FENCE DETAIL
SCALE: NTS



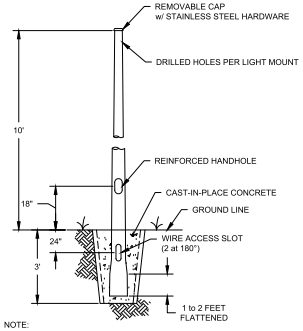
NOTES:
1. INSTALL WIRING PER MAINE ELECTRICAL CODE & CMP REQUIREMENTS.
2. CONTRACTOR TO INSTALL CABLES PER CODE AND UTILITY SPECIFICATIONS. MATERIAL TO BE SUPPLIED BY OWNER. COORDINATE INSTALLATION WITH LOCAL UTILITIES.

ELECTRIC TRENCH DETAIL
NOT TO SCALE



NOTES:
EQUIPMENT PAD SUB-BASE SHALL BE 6" OF ¾" CRUSHED STONE ON 1'-0" OF MDOT TYPE A GRAVEL THAT IS COMPACTED 95% STANDARD PROCTOR DENSITY.
EQUIPMENT PAD 1 FINISH FLOOR ELEVATION: 298.5'
EQUIPMENT PAD 2 FINISH FLOOR ELEVATION: 313.5'

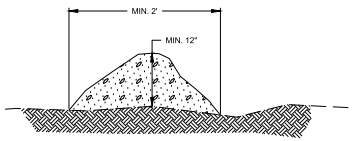
EQUIPMENT PAD DETAIL
SCALE: NTS



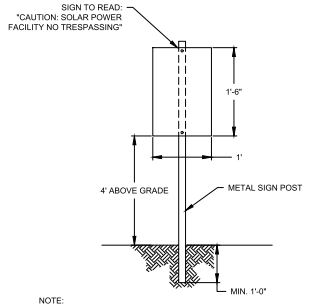
NOTE:
ROUND TAPERED DIRECT BURIAL 6063 ALUMINUM LIGHT POLE, 10 FEET ABOVE GRADE, 5 INCH DIAMETER, 0.125 INCH WALL THICKNESS OR APPROVED EQUAL.
HUBBELL OUTDOOR LIGHTING GEOPACK SERIES SIZE 1 LED LIGHT TRP1, TYPE III, ZERO UPLIGHT (UO) DARK SKY, NEIGHBOR FRIENDLY OR APPROVED EQUAL.

OUTDOOR LIGHT POLE DETAIL
SCALE: NTS

NOTE:
IN LIEU OF SILT FENCE EROSION CONTROL MIX CAN BE USED IF CONDITIONS BELOW ARE MET. FOLLOW MAINE EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES 2016.
EROSION CONTROL MIX BERM:
THE ECM BERM SHOULD BE A MINIMUM OF 12" HIGH AND A MINIMUM OF TWO FEET WIDE. ON LONGER OR STEEPER SLOPES, THE BERM WILL NEED TO BE WIDER AND HIGHER. BERMS COMPOSED OF ECM CAN BE RESHAPED WHEN NECESSARY.
EROSION CONTROL MIX:
THE MIX MUST BE WELL-GRADED WITH AN ORGANIC COMPONENT THAT IS BETWEEN 50 AND 100% OF DRY WEIGHT, AND THAT IS COMPOSED OF FIBROUS AND ELONGATED FRAGMENTS. THE MINERAL PORTION OF THE MIX SHOULD BE NATURALLY INCLUDED IN THE PRODUCT WITH NO LARGER ROCKS (>4") OR LARGE AMOUNTS OF FINES (SILTS AND CLAYS). IN STUMP GRINDING, THE MINERAL SOIL ORIGINATES FROM THE ROOT BALL AND SHOULD NOT BE REMOVED BEFORE GRINDING. THE MIX SHOULD BE FREE OF REFUSE, MATERIAL TOXIC TO PLANT GROWTH OR UNSUITABLE MATERIAL (BARK CHIPS, GROUND CONSTRUCTION DEBRIS OR REPROCESSED WOOD PRODUCTS).

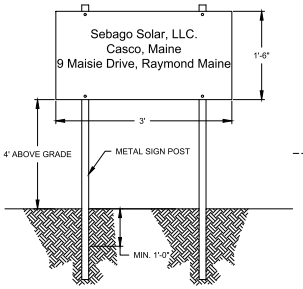


EROSION CONTROL MIX BERM DETAIL
SCALE: NTS

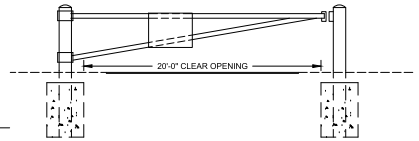


NOTE:
SIGNS SHOULD BE PLACED AT A MAXIMUM OF 100' SPACING ALONG PROJECT BOUNDARY.

NO TRESPASSING SIGN DETAIL
SCALE: NTS

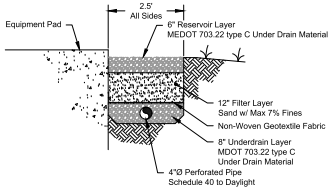


PROJECT SIGN DETAIL
SCALE: NTS



NOTE:
ALL ENTRANCE GATES SHALL HAVE A MINIMUM OPEN CLEARANCE OF 20 FEET. ALL GATES SHALL HAVE A RAYMOND & WINDHAM FIRE AND RESCUE DEPARTMENT KNOX BOX THAT INCLUDE ALL KEYS OR KEY CARDS, AND CURRENT SITE EMERGENCY CONTACT INFORMATION.

ENTRANCE GATE DETAIL
SCALE: NTS



DRIP LINE FILTER DETAIL
SCALE: NTS

FOR REGULATORY REVIEW
DO NOT USE FOR CONSTRUCTION

No.	Revision Description	Drwn	Chk'd	Date
B	Added GW level spreader & Buffer Yard Details	KJB	KJB	10-02-24
A	Revised Project from 5MW to 3.5MW	KJB	KJB	8-14-24

Drwn By: BPC
Desg By: BPC / KJB
Chkd By: KJB
Aprvd By: KJB
Date: 8-14-24

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Details

Sebago Solar, LLC
Cumberland County
9 Maisie Drive - Raymond, Maine

Job Number: 80930

Drawing No: D-1

Sheet 6 of 8