January 31, 2022 (Revised February 2024)

Ms. Megan Kuczka
Environmental Program Specialist, Region 9
New York State Department of Environmental Conservation
700 Delaware Avenue
Buffalo, New York 14209

RE: ExxonMobil Former Buffalo Terminal Operable Units 2 East and 3 – Clean Capital (formerly BQ Energy Development, LLC) Change of Use Letter Work Plan: 503, 623, 625, 635 Elk Street, Buffalo, NY (NYSDEC Sites #C915201D and #C915201B) LaBella Project # 2211232

Dear Ms. Kuczka:

On behalf of Clean Capital (formerly BQ Energy Development, LLC), LaBella Associates, DPC has prepared this Change of Use Letter Work Plan for the construction of a solar energy generating facility on portions of Operable Unit No. 3 (OU-3) and Operable Unit No. 2 East (OU-2E) of the ExxonMobil Former Buffalo Terminal site (NYSDEC Sites #C915201D and #C915201B). Elk Street Solar will be the site name and Inovateus will be the solar installation contractor. Please see Figure 1 for the location of the respective Operable Units. This work plan was requested by the New York State Department of Environmental Conservation (NYSDEC) in a letter dated March 3, 2021 subsequent to the submittal of a Change of Use Form in January 2021 for development of the solar facility. Furthermore, this work plan is intended to comply with the requirements of the Excavation Work Plans (EWPs) contained in the respective Site Management Plans (SMPs) for OU-3 and OU-2 East. As indicated on the attached Elk Street Solar Development Project Design Drawings, the solar facility will be constructed on the western portion of OU-3, above the Geo-Synthetic Liner (GSL) and stone cover system. The connection to the power grid will occur in the south-central portion of OU-2 East, in the vicinity of the existing Buckeye Terminal Powerhouse Building, also depicted on the attached design drawings.

Project Description

Clean Capital plans to construct a Photovoltaic (PV) solar facility that will generate 2.3 megawatts of alternating current (MWac) on approximately 10 acres encompassing portions of OU-3 and OU-2E. The limits of the PV facility are shown on the attached design drawings. The fixed-tilt solar PV System utilizing Remote Net Metering (RNM) will be installed and maintained by Clean Capital. Ongoing compliance with the Site Management Plans (SMPs) for OU-3 and OU-2 East will continue to be the responsibility of the owner, Elk Street Commerce Park, LLC (ESCP).

Photovoltaic System

The PV System will consist of approximately 8,710 430-watt solar modules affixed to panels supported by a non-penetrating surface-mounted ballast racking system (see attached Design Drawings). Electrical service to the PV System will be provided via interconnection to the existing electrical infrastructure on OU-2 East. The existing asphalt access road servicing the Groundwater Extraction Treatment System (GWETS) will support construction and fire access to the PV System equipment pad to be located proximate the GWETS parking lot. Existing perimeter fencing will be supplemented where necessary with additional ballasted fencing and gates to be constructed to fully enclose the PV System for safety.

The PV array consists of approximately 28 east-west rows on the central portion of OU-3, spaced approximately 11' from front-to-back edge of rows, installed on a surface-mounted ballast racking system. The array was configured to avoid impeding access to, or operation of, the existing GWETS and associated access road and parking lot. Additionally, care was taken to provide a 10' minimum buffer around the existing monitoring wells, extraction wells, and conveyance piping. The minimum 10' working area will provide sufficient space for equipment and personnel to facilitate the construction and maintenance of the solar arrays while preventing damage to these components of the active groundwater remediation system. This setback will provide sufficient space for the continued operation and maintenance of the extraction wells and piping. The modules and electrical equipment will also be setback 5' and 10', respectively, from existing gas vents present on OU-3.

Electrical equipment associated with the PV System (i.e., switchboard, transformers, etc.) will be placed on a concrete equipment pad to be constructed above the existing OU-3 cover system to the east of the GWETS parking lot.

Within the limits of OU-3, wiring within the array will be mounted from rack-to-rack and in between rows via covered cable trays mounted above the ground surface on ballasted concrete piers, or on a cable hanger system mounted above the ground surface on ballasted poles as shown on the design drawings. Beyond the limits of OU-3, wiring will extend northward in underground conduit to a series of seven utility poles to be installed to facilitate the interconnection with the existing National Grid system.

Planned Construction Activities

Operable Unit 3 - #C915201D

For the construction of the solar panel array, fencing, asphalt turnaround, and ancillary equipment placement, the construction will take place entirely above the GSL and overlying 12-inch stone cover that comprise the cover system in this area. This will be conducted with various ballasting techniques as depicted on the design drawings. Import Requests will be generated and submitted to NYSDEC for the ballast and leveling material.

No construction activities will penetrate the cover system exposing or disturbing remaining contamination within OU-3. Traversing, transporting, and solar equipment installation will be

conducted with Low Ground Pressure (LGP) equipment as to protect the GSL. If needed, Bank Run #67 clean stone will be used to fulfill the stone cover system replacement. Further, it should be noted that the solar array construction will not interfere with the existing groundwater extraction and treatment system operation.

Operable Unit 2 East - #C915201B

Similar to the equipment installation techniques utilized for OU-3, the gates, fencing, conduit runs, and ancillary equipment will be situated with ballasting techniques to avoid penetrating the stone cover system and disturbing the remaining contamination in the underlying soils of OU-2 East to the extent practical.

Intrusive activities into the stabilized, mixed soils of OU-2 East will be limited to the installation of the utility poles, associated guy wires, and trenching for electrical conduit. The existing one foot of stone cover and the demarcation layer will be segregated prior to intrusive activities. The holes/trenching will be advanced to required depth (<6' below grade). The excavated spoils will be placed on poly sheeting. The installation of the necessary equipment will be conducted. The excavated spoils will then be used as backfill material and compacted. This material will be mounded to make every effort to shed water. The remaining soil will be disposed of properly. The demarcation layer and clean stone will then be replaced. Should clean backfill material be required, an Import Request form will be initiated and submitted to NYSDEC for approval.

Construction Schedule

The construction of the solar facility is anticipated to begin in the Fall of 2023 (schedule attached). It is estimated that this construction will take approximately six months. NYSDEC will be updated appropriately of the schedule when the time nears.

As requested, City of Buffalo approvals from the Planning Department and the Building Department will be provided once they are obtained.

Anticipated Environmental Conditions

In-situ stabilized petroleum impacted media is expected to be encountered at the intrusive work locations west of the Powerhouse within OU-2 East. This soil was stabilized as part of the final remedial construction effort conducted in 2018-2019. Groundwater is not expected to be encountered in this area of the Site at the depths the intrusive activities are expected (<6' below grade).

Compliance with Excavation Work Plan

The work will be completed in accordance with the EWPs and with applicable provisions of 29 CFR Part 1910.120. Components of the EWP that apply to this construction program include:

- Notification
- Soil Screening

- Material Staging, Transport & Disposal
- Cover System Restoration
- Community Air Monitoring Plan
- Dust Control

Pursuant to the EWP, the intrusive activities to be performed on OU-2 East will be monitored for particulates and Volatile Organic Compounds (VOCs) as prescribed in the Community Air Monitoring Plan (CAMP) for the Site. This data will be provided to NYSDEC and NYSDOH daily for the extent of intrusive activities. Additionally, sediment and erosion control practices will be in place as prescribed on the design drawings for all excavations.

Compliance with Site Management Plan

For continued monitoring compliance with the SMP, wells MW-OU2-1 and MW-OU2-2 will be re-surveyed for elevation when their well heads are converted from stickup casings to flush-mount casings.

Health & Safety Plan

A copy of the Contractor's updated Health & Safety Plan is included as an attachment of this document.

Identification of Waste Disposal Facilities

Should it become necessary to dispose of waste materials, the material will be sampled and characterized. These materials will be containerized and disposed of at Allied Waste in Niagara Falls, New York or the Waste Management facility in Chaffee, New York.

Construction Completion Report and SMP Update

It is anticipated that the Construction Completion Report (CCR) and applicable updates to the SMP for the solar facility will be submitted within 90 days following completion of construction.

Respectfully submitted,

LaBella Associates

Andrew Janik, PG

Project Manager

cc: Eugene Melnyk, PE (NYSDEC)

Alicia Scott (Clean Capital)
Paul Neureuter (ESCP)
Matt Pearson (Krog)
Rob Napieralski (LaBella)
Alyssa Hartigan (Clean Capital)
Sierra Haney (Clean Capital)

Creator: JR

Path: I:\Elk Street Commerce Park\2200012 - OM&M Elk St Commerce\GIS\MXD\PFAS\2021_12\Fig1 BQ Energy.mxd

LaBella
Powered by partnership.

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0 200 400 Feet

Legend

- Monitoring Well
- Operational Unit 2 (OU-2) East Boundary
- Operational Unit 3 (OU-3) Boundary
- Proposed Solar Array Location

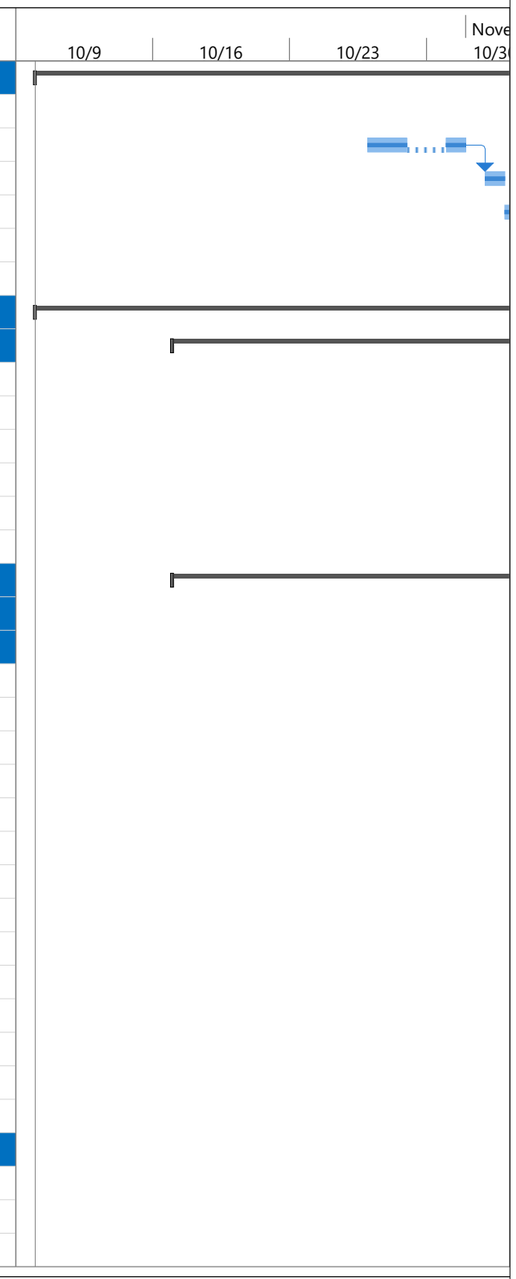
Sources: Bing 2020; Erie County 2020; LaBella 2021.

BQ Energy
Elk Street Solar Development Project

Figure 1

Elk Street Solar
Construction Schedule - Update 3/11/24

ID	Task Name	Duration	Start	Finish	Total Slack	Baseline Start	Baseline Finish	Predecessors	Successors	% Complete
1	**Pre-Design Development**	**431 days**	**Mon 10/10/22**	**Thu 2/29/24**	**106 days**	**Thu 10/27/22**	**Mon 7/10/23**			**91%**
2	Underground Utility Survey	10 days	Thu 1/5/23	Wed 1/18/23	0 days	Thu 1/5/23	Wed 1/18/23	9		100%
3	Suneye Shading Analysis	3 days	Thu 10/27/22	Mon 10/31/22	0 days	Thu 10/27/22	Mon 10/31/22	11SS	4	100%
4	Glare Analysis	1 day	Wed 11/2/22	Wed 11/2/22	0 days	Wed 11/2/22	Wed 11/2/22	3		100%
5	FAA Filing	1 day	Thu 11/3/22	Thu 11/3/22	0 days	Thu 11/3/22	Thu 11/3/22	9		100%
6	Permitting	15 days	Thu 9/14/23	Wed 10/4/23	0 days	Fri 3/3/23	Mon 7/10/23	13	79	100%
7	ALTA Survey	82 days	Mon 11/13/23	Thu 2/29/24	106 days	NA	NA	32	74	75%
8	**Pre-Engineering**	**97 days**	**Mon 10/10/22**	**Mon 1/30/23**	**0 days**	**Mon 10/10/22**	**Mon 1/30/23**			**100%**
12	**Contract Milestones**	**531 days**	**Mon 10/17/22**	**Tue 7/2/24**	**0 days**	**Fri 3/3/23**	**Fri 5/17/24**			**99%**
13	Contract Signing	0 days	Fri 3/3/23	Fri 3/3/23	0 days	Fri 3/3/23	Fri 3/3/23		14FS+6 days,6	100%
14	Final Notice To Proceed	0 days	Sat 3/11/23	Sat 3/11/23	0 days	Fri 3/10/23	Fri 3/10/23	13FS+6 days		100%
15	Mechanical Completion (MS Payment)	0 days	Mon 4/22/24	Mon 4/22/24	37 days	Tue 3/5/24	Tue 3/12/24	110FF	16,130	0%
16	Placed In Service	0 days	Wed 5/15/24	Wed 5/15/24	41 days	Fri 3/29/24	Tue 3/5/24	15,125	17	0%
17	Substantial Completion (MS Payment)	0 days	Tue 6/4/24	Tue 6/4/24	24 days	Fri 4/19/24	Fri 4/26/24	130,16	18	0%
18	Final Completion (MS Payment)	0 days	Tue 7/2/24	Tue 7/2/24	0 days	Fri 5/17/24	Fri 5/24/24	17,137		0%
19	**RFQs for Major Equipment**	**227 days**	**Mon 10/17/22**	**Fri 7/7/23**	**0 days**	**Mon 10/17/22**	**Thu 2/23/23**			**100%**
25	**Engineering Design**	**211 days**	**Mon 3/20/23**	**Mon 11/20/23**	**0 days**	**Fri 3/3/23**	**Tue 9/12/23**			**100%**
35	**Material Procurement**	**279 days**	**Thu 5/4/23**	**Fri 3/29/24**	**75 days**	**Thu 5/4/23**	**Tue 3/5/24**			**99%**
36	Release Pos (Long Lead Equipment)	2 days	Thu 5/4/23	Fri 5/5/23	0 days	Thu 5/4/23	Fri 5/5/23	26FS+32 days	41,47,48,49,3	100%
37	Release Pos (Remaining Equipment)	10 days	Mon 9/25/23	Thu 10/5/23	0 days	Fri 7/7/23	Tue 7/11/23	29	44,42,43,45FS	100%
38	Ballasts	8 wks	Mon 8/7/23	Fri 9/29/23	0 wks	Mon 5/8/23	Mon 7/3/23	30,36	51	100%
39	Posts	37 days	Thu 10/5/23	Mon 11/27/23	0 days	Mon 5/8/23	Mon 8/28/23	22,36	52	100%
40	Racking	37 days	Thu 10/5/23	Mon 11/27/23	0 days	Mon 5/8/23	Mon 7/3/23	22,36	53	100%
41	Combiner Boxes	92 days	Wed 5/24/23	Thu 9/28/23	0 days	Mon 5/8/23	Mon 7/17/23	27,36	54	100%
42	CAB	40 days	Tue 10/3/23	Mon 11/27/23	0 days	Wed 7/12/23	Wed 9/6/23	30FS+41 days,37	56	100%
43	Inverters	66 days	Fri 6/23/23	Fri 9/22/23	0 days	Wed 7/12/23	Tue 8/22/23	27FS+22 days,21	57	100%
44	GOAB/Reclosers/Relays	9 wks	Wed 7/12/23	Fri 10/6/23	0 wks	Wed 7/12/23	Wed 10/4/23	37,24	58,60	100%
45	Surge Arresters	41 days	Mon 12/11/23	Tue 1/30/24	0 days	Wed 7/12/23	Wed 10/4/23	37FS+30 days	59FS+40 days	100%
46	Monitoring	76 days	Thu 10/5/23	Mon 1/15/24	0 days	Wed 7/12/23	Tue 8/8/23	32FS+8 days,37	61	100%
47	Switchboard	163 days	Wed 5/24/23	Fri 1/12/24	0 days	Mon 5/8/23	Tue 3/5/24	27,36,23	62FS+55 days	100%
48	Transformer	130 days	Wed 5/24/23	Tue 11/21/23	0 days	Mon 5/8/23	Tue 2/6/24	27,36,20	63FS+65 days	100%
49	Grounding Transformer	118 days	Fri 7/7/23	Thu 12/21/23	0 days	Mon 5/8/23	Mon 8/28/23	27,36	64	100%
50	**Material Deliveries**	**175.5 days**	**Fri 9/1/23**	**Fri 3/29/24**	**75 days**	**Tue 7/4/23**	**Thu 2/15/24**			**91%**
51	Ballasts	23 days	Wed 10/4/23	Fri 11/3/23	0 days	Tue 7/4/23	Mon 8/7/23	38	85SS-5 days	100%
52	Posts	29 days	Tue 11/28/23	Thu 1/4/24	0 days	Tue 8/29/23	Tue 10/3/23	39	86SS	100%
53	Racking (MS Payment)	6 wks	Tue 11/28/23	Fri 1/5/24	0 wks	Tue 8/29/23	Tue 10/3/23	40	87SS	100%

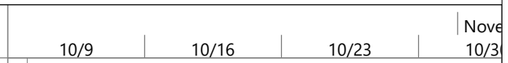


Project: Elk Street Construction
Date: Tue 3/19/24

Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Progress
Manual Progress

Elk Street Solar
Construction Schedule - Update 3/11/24

ID	Task Name	Duration	Start	Finish	Total Slack	Baseline Start	Baseline Finish	Predecessors	Successors	% Complete
54	Combiner Boxes	1 day	Fri 9/29/23	Fri 9/29/23	0 days	Tue 7/18/23	Wed 10/18/23	41	93	100%
55	Modules (Owner Furnished)	10 days	Mon 9/25/23	Thu 10/5/23	0 days	Wed 9/27/23	Tue 11/7/23		88SS	100%
56	CAB	1 day	Mon 11/27/23	Mon 11/27/23	0 days	Thu 9/7/23	Thu 9/7/23	42	92	100%
57	Inverters (MS Payment)	1 day	Mon 9/25/23	Mon 9/25/23	0 days	Wed 8/23/23	Wed 8/23/23	43	95	100%
58	GOAB	1 day	Fri 9/1/23	Mon 9/4/23	0 days	Thu 10/5/23	Thu 10/5/23	44,37	60FS+5 days,5	100%
59	Surge Arresters	1 day	Mon 3/18/24	Mon 3/18/24	0 days	Thu 10/5/23	Thu 10/5/23	45FS+40 days,58		100%
60	Recloser/Relays	5 days	Thu 2/8/24	Tue 2/13/24	0 days	Thu 2/15/24	Thu 2/15/24	44,58FS+5 days		100%
61	Monitoring	0 wks	Wed 1/10/24	Wed 1/10/24	0 wks	Wed 8/9/23	Tue 8/15/23	46		100%
62	Switchboard	5 days	Mon 3/25/24	Fri 3/29/24	75 days	Tue 2/27/24	Tue 2/13/24	47FS+55 days	96,63SS	0%
63	Transformer	5 days	Mon 3/25/24	Fri 3/29/24	75 days	Wed 2/7/24	Tue 2/13/24	48FS+65 days,62	97	0%
64	Grounding Transformer	5 days	Sat 12/23/23	Fri 12/29/23	0 days	Tue 8/29/23	Tue 9/5/23	49		100%
65	**Construction**	**311 days**	**Fri 6/30/23**	**Tue 7/2/24**	**0 days**	**Fri 6/30/23**	**Tue 9/26/23**			**25%**
66	**Site Mobilization**	**108 days**	**Fri 6/30/23**	**Thu 11/2/23**	**0 days**	**Fri 6/30/23**	**Wed 7/19/23**			**100%**
73	**Pre-Construction Activities**	**73 days**	**Thu 10/19/23**	**Wed 1/17/24**	**0 days**	**Mon 8/7/23**	**Thu 8/17/23**			**100%**
77	**Mechanical Completion**	**74 days**	**Wed 1/31/24**	**Thu 4/25/24**	**58 days**	**Mon 8/14/23**	**Tue 3/12/24**			**34%**
78	**Civil Installation (MS Payment)**	**69 days**	**Tue 2/6/24**	**Thu 4/25/24**	**58 days**	**Mon 8/14/23**	**Tue 9/26/23**			**0%**
79	Install SWPPP/SESC Measures	0 days	Tue 2/6/24	Tue 2/6/24	0 days	Wed 9/13/23	Tue 9/19/23	6,33,76,74SS+31	81FS+3 days,8	100%
80	Install Site Road Access/Drive/Culvert	15 days	Fri 3/15/24	Mon 4/1/24	79 days	Mon 8/14/23	Fri 8/18/23	79SS+2 days		0%
81	Install Fence	6 wks	Fri 3/22/24	Thu 4/25/24	11.6 wks	Wed 9/13/23	Tue 9/19/23	79FS+3 days		0%
82	Install Equipment Pads	5 days	Mon 3/25/24	Fri 3/29/24	11 days	Wed 9/13/23	Tue 9/26/23		83	0%
83	Concrete Cure	7 days	Sat 3/30/24	Sat 4/6/24	11 days	Fri 10/27/23	Tue 10/17/23	82	97,96,95	0%
84	**Mechanical Assembly**	**49 days**	**Wed 1/31/24**	**Wed 3/27/24**	**18 days**	**Wed 9/13/23**	**Tue 11/14/23**			**90%**
85	Install Ballasts (MS Payment)	32 days	Wed 1/31/24	Thu 3/7/24	0 days	Wed 9/20/23	Tue 10/17/23	51SS-5 days,74S	86FS-12 days	100%
86	Install Posts	26 days	Mon 2/12/24	Tue 3/12/24	0 days	Wed 9/27/23	Tue 10/31/23	85FS-12 days,52	87SS	100%
87	Install Racking (MS Payment)	26 days	Mon 2/12/24	Tue 3/12/24	0 days	Wed 10/4/23	Tue 11/7/23	86SS,53SS	88FF+4 days,1	100%
88	Install Modules (MS Payment)	15 days	Mon 3/11/24	Wed 3/27/24	18 days	Wed 10/11/23	Tue 11/14/23	87FF+4 days,55S	92FF+6 days,9	31%
89	**Electrical Assembly**	**36 days**	**Thu 3/14/24**	**Wed 4/24/24**	**59 days**	**Wed 9/27/23**	**Tue 3/5/24**			**3%**
90	Install PV String Wiring Runs	10 days	Thu 3/21/24	Mon 4/1/24	24 days	Tue 11/7/23	Mon 11/20/23	88FF+4 days	108,91FF+2 da	20%
91	PV String Wire Termination	8 days	Tue 3/26/24	Wed 4/3/24	48 days	Thu 11/9/23	Fri 12/8/23	90FF+2 days	117	0%
92	CAB Installation	12 days	Thu 3/21/24	Wed 4/3/24	18 days	Tue 10/31/23	Thu 11/30/23	88FF+6 days,56	102FF+5 days,	0%
93	Install DC Combiner Boxes	5 days	Thu 3/14/24	Fri 3/29/24	51 days	Fri 10/27/23	Thu 11/9/23	88FF+2 days,54	102FF+5 days	33%
94	Install DC System Cabling (Home runs) & Terminations	15 days	Fri 3/22/24	Mon 4/8/24	18 days	Thu 11/2/23	Fri 12/1/23	92SS+1 day	108	0%
95	Install/Terminate String Inverters (MS Payment)	12 days	Mon 4/8/24	Sat 4/20/24	11 days	Tue 10/31/23	Mon 11/20/23	57,83	104FF+1 day,1	0%
96	Install Switchboard Skid	5 days	Mon 4/8/24	Fri 4/12/24	68 days	Wed 2/14/24	Tue 2/27/24	62,83	101,103	0%
97	Install Transformer	1 day	Mon 4/8/24	Mon 4/8/24	68 days	Wed 2/14/24	Thu 2/22/24	63,83	105FF,116	0%

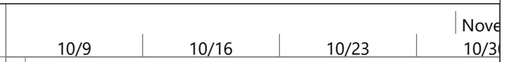


Project: Elk Street Construction
Date: Tue 3/19/24

Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Progress
Manual Progress

Elk Street Solar
Construction Schedule - Update 3/11/24

ID	Task Name	Duration	Start	Finish	Total Slack	Baseline Start	Baseline Finish	Predecessors	Successors	% Complete
98	Install Poles	5 days	Mon 4/1/24	Fri 4/5/24	75 days	Tue 10/10/23	Mon 10/23/23	75FS+85 days,34	99SS,100SS	0%
99	Install AC Overhead Line Cables	5 days	Mon 4/1/24	Fri 4/5/24	75 days	Tue 10/24/23	Mon 10/30/23	98SS		0%
100	Install GOAB/Recloser/Relay	5 days	Mon 4/1/24	Fri 4/5/24	75 days	Tue 2/20/24	Mon 2/26/24	98SS		0%
101	Install Mini Power Zones	1 day	Sat 4/13/24	Sat 4/13/24	68 days	Wed 2/28/24	Tue 3/5/24	96		0%
102	Install System Grounding	7 days	Tue 4/2/24	Tue 4/9/24	47 days	Tue 11/21/23	Mon 12/4/23	92FF+5 days,87F	109FF+1 day	0%
103	Install Grounding Transformer	1 day	Sat 4/13/24	Sat 4/13/24	68 days	Wed 9/27/23	Tue 10/3/23	96		0%
104	Install DAS (Monitoring)	5 days	Wed 4/17/24	Mon 4/22/24	11 days	Tue 11/21/23	Wed 11/29/23	95FF+1 day	106,110	0%
105	Install AC System Cabling & Terminations	12 days	Tue 3/26/24	Mon 4/8/24	73 days	Tue 11/21/23	Wed 12/6/23	97FF		0%
106	Install System Signage	2 days	Tue 4/23/24	Wed 4/24/24	59 days	Wed 10/4/23	Wed 10/4/23	104		0%
107	**Testing**	**13 days**	**Mon 4/8/24**	**Mon 4/22/24**	**19 days**	**Wed 9/27/23**	**Tue 12/26/23**			**0%**
108	Megger Testing	5 days	Tue 4/9/24	Sat 4/13/24	18 days	Mon 12/11/23	Fri 1/26/24	90,94	110	0%
109	Rack, Module and Equipment Grounding Inspection	3 days	Mon 4/8/24	Wed 4/10/24	47 days	Wed 3/6/24	Thu 2/8/24	88,87,102FF+1 day	130	0%
110	Mechanical completion Achieved	0 days	Mon 4/22/24	Mon 4/22/24	11 days	Tue 3/5/24	Tue 3/5/24	108,95,104	15FF,132,115	0%
111	**Substantial Completion**	**256 days**	**Sat 8/5/23**	**Tue 6/4/24**	**24 days**	**Tue 2/27/24**	**Fri 4/26/24**			**10%**
112	Phase B Approval	209 days	Sat 8/5/23	Wed 4/10/24	0 days	NA	NA	30	113	14%
113	National Grid Construction	40 days	Thu 4/11/24	Mon 5/27/24	-17 days	NA	NA	112	118FS+1 day,1	0%
114	Inverter Field Service Notification	5 days	Wed 5/22/24	Mon 5/27/24	31 days	Wed 3/6/24	Tue 3/12/24	113FF		0%
115	Notify Utility of Commissioning	2 days	Tue 4/23/24	Wed 4/24/24	11 days	Wed 3/6/24	Thu 3/7/24	110	118FS+1 day,1	0%
116	Transformer NETA Test Report	5 days	Tue 4/9/24	Sat 4/13/24	68 days	Fri 3/1/24	Wed 2/7/24	97		0%
117	Polarity, Voc & Isc Test	5 days	Thu 4/4/24	Tue 4/9/24	48 days	Tue 2/27/24	Thu 3/7/24	88,91	130	0%
118	Backfeed Power- Temporary Energization	0 days	Tue 5/28/24	Tue 5/28/24	-17 days	Thu 3/7/24	Thu 3/7/24	115FS+1 day,113	130,120	0%
119	**Commissioning Activities**	**23 days**	**Thu 5/9/24**	**Tue 6/4/24**	**-11 days**	**Wed 3/6/24**	**Fri 4/19/24**			**0%**
120	Inverter Commissioning	3 days	Wed 5/29/24	Fri 5/31/24	-17 days	Fri 3/8/24	Thu 3/14/24	113,115,118	130,121SS+1 c	0%
121	Relay Setting Upload and Functionality Test	3 days	Thu 5/30/24	Sat 6/1/24	-17 days	Fri 3/8/24	Fri 3/8/24	120SS+1 day	130,122	0%
122	Communications Test	2 days	Mon 6/3/24	Tue 6/4/24	-17 days	Fri 3/15/24	Thu 4/11/24	121	130,123	0%
123	Operating Current Test	0 days	Thu 5/9/24	Fri 5/10/24	6 days	Fri 4/12/24	Fri 4/19/24	122	130,125,124FS	0%
124	National Grid Witness Test	3 days	Mon 5/13/24	Wed 5/15/24	6 days	Mon 3/11/24	Fri 3/15/24	123FS+1 day	130,125	0%
125	Placed in Service	0 days	Wed 5/15/24	Wed 5/15/24	6 days	Mon 3/18/24	Fri 4/5/24	123,124	130,16,126	0%
126	IR Thermal Imaging	1 day	Thu 5/16/24	Thu 5/16/24	6 days	Fri 3/29/24	Mon 4/1/24	125	130,127	0%
127	DC IV Curve Tracing	5 days	Fri 5/17/24	Wed 5/22/24	6 days	Fri 3/15/24	Thu 3/28/24	126	130,128	0%
128	Performance Test/Capactiy Test	5 days	Thu 5/23/24	Tue 5/28/24	6 days	Mon 4/1/24	Fri 4/19/24	127	130,129FF	0%
129	Punchlist Creation	5 days	Thu 5/23/24	Tue 5/28/24	9 days	Mon 4/15/24	Fri 4/19/24	128FF	133	0%
130	Substanial Completion Achieved	0 days	Tue 6/4/24	Tue 6/4/24	0 days	Fri 4/19/24	Fri 4/19/24	117,118,127,122	17,132	0%
131	**Final Completion**	**30 days**	**Wed 5/29/24**	**Tue 7/2/24**	**0 days**	**Mon 2/19/24**	**Fri 5/24/24**			**0%**
132	Permit Closeout and Inspections	14 days	Wed 6/5/24	Thu 6/20/24	0 days	Mon 4/22/24	Fri 5/3/24	130,110	136,135,137	0%

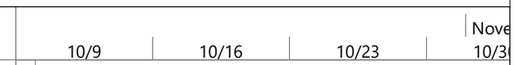


Project: Elk Street Construction
Date: Tue 3/19/24

Task | Project Summary | Manual Task | Start-only | Deadline
Split | Inactive Task | Duration-only | Finish-only | Progress
Milestone | Inactive Milestone | Manual Summary Rollup | External Tasks | Manual Progress
Summary | Inactive Summary | Manual Summary | External Milestone

Elk Street Solar
Construction Schedule - Update 3/11/24

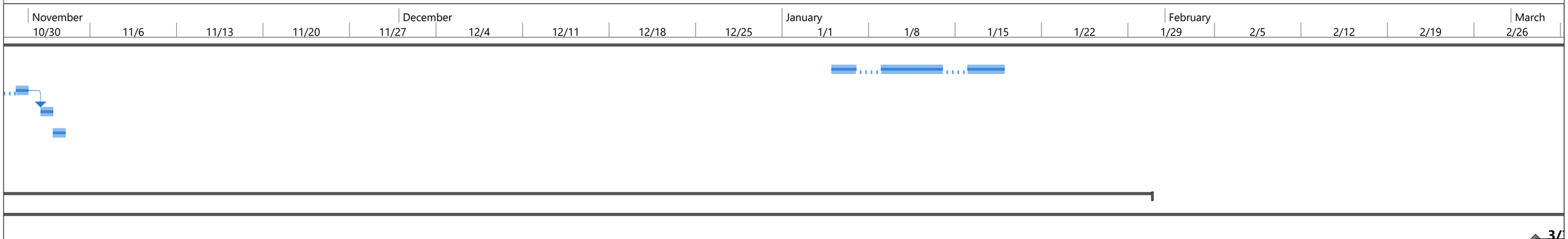
ID	Task Name	Duration	Start	Finish	Total Slack	Baseline Start	Baseline Finish	Predecessors	Successors	% Complete
133	Punch-List Completion	11 days	Wed 5/29/24	Mon 6/10/24	9 days	Mon 4/22/24	Fri 5/3/24	129	134,137	0%
134	Closeout Documents and Lien Waivers	10 days	Tue 6/11/24	Fri 6/21/24	9 days	Mon 5/6/24	Fri 5/17/24	133	137	0%
135	Training	1 day	Fri 6/21/24	Fri 6/21/24	9 days	Mon 5/6/24	Mon 5/6/24	132	137	0%
136	Issue Record Drawings & O&M Manual	10 days	Fri 6/21/24	Tue 7/2/24	0 days	Mon 5/6/24	Fri 5/17/24	132	137	0%
137	Final Completion achieved	0 days	Tue 7/2/24	Tue 7/2/24	0 days	Fri 5/17/24	Fri 5/17/24	132,133,134,135	18	0%



Project: Elk Street Construction
Date: Tue 3/19/24

Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Progress
Manual Progress

Elk Street Solar
Construction Schedule - Update 3/11/24



Project: Elk Street Construction
Date: Tue 3/19/24

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone

Elk Street Solar
Construction Schedule - Update 3/11/24

November				December					January				February				March
10/30	11/6	11/13	11/20	11/27	12/4	12/11	12/18	12/25	1/1	1/8	1/15	1/22	1/29	2/5	2/12	2/19	2/26

Project: Elk Street Construction
Date: Tue 3/19/24

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone	

Elk Street Solar
Construction Schedule - Update 3/11/24

November				December					January				February				March
10/30	11/6	11/13	11/20	11/27	12/4	12/11	12/18	12/25	1/1	1/8	1/15	1/22	1/29	2/5	2/12	2/19	2/26

Project: Elk Street Construction
Date: Tue 3/19/24

Task	Project Summary	Manual Task	Start-only	Deadline
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Elk Street Solar
Construction Schedule - Update 3/11/24

November				December					January				February				March
10/30	11/6	11/13	11/20	11/27	12/4	12/11	12/18	12/25	1/1	1/8	1/15	1/22	1/29	2/5	2/12	2/19	2/26

Project: Elk Street Construction
Date: Tue 3/19/24

Task		Project Summary		Manual Task		Start-only		Deadline	
Split		Inactive Task		Duration-only		Finish-only		Progress	
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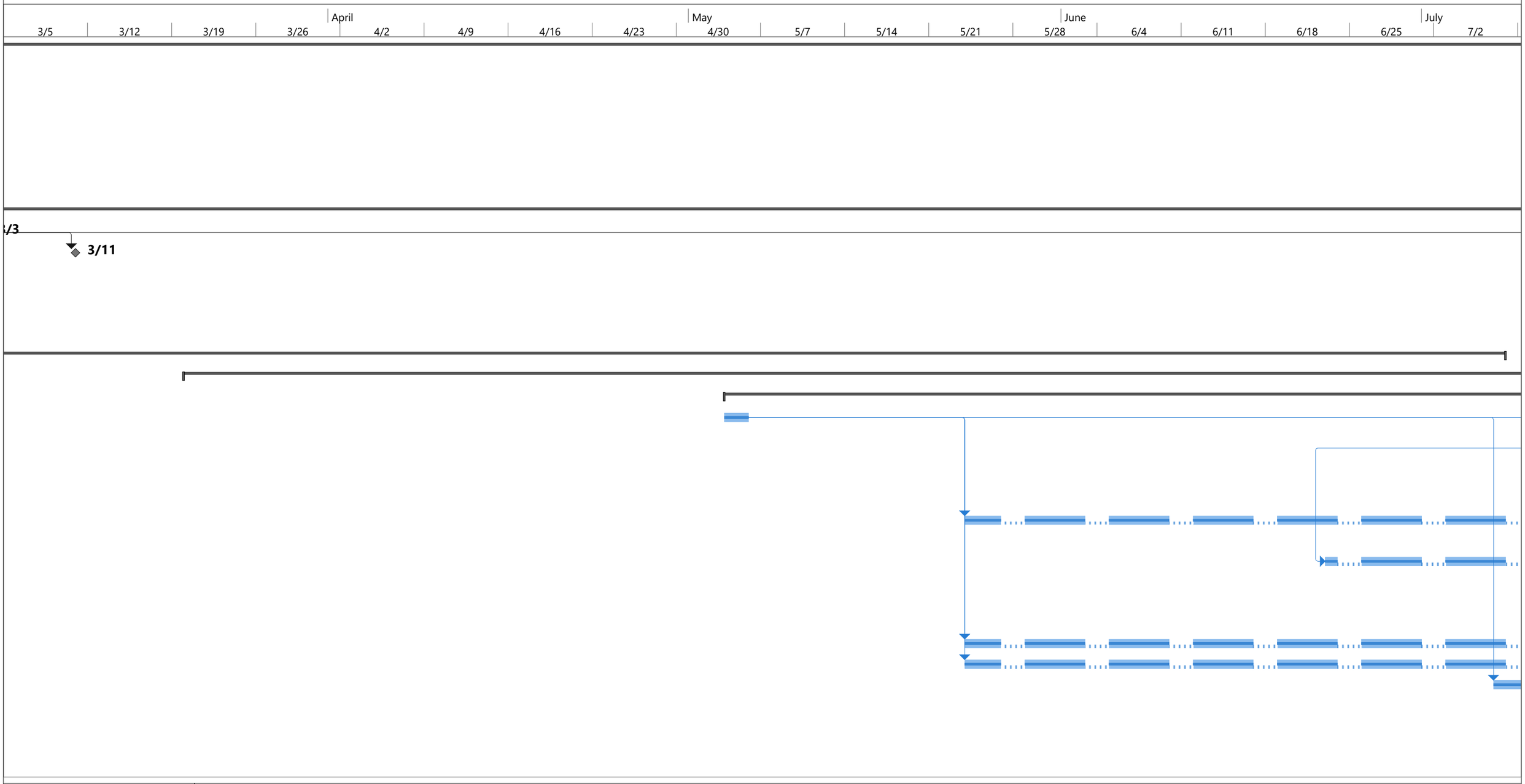
Elk Street Solar
Construction Schedule - Update 3/11/24



Project: Elk Street Construction
Date: Tue 3/19/24

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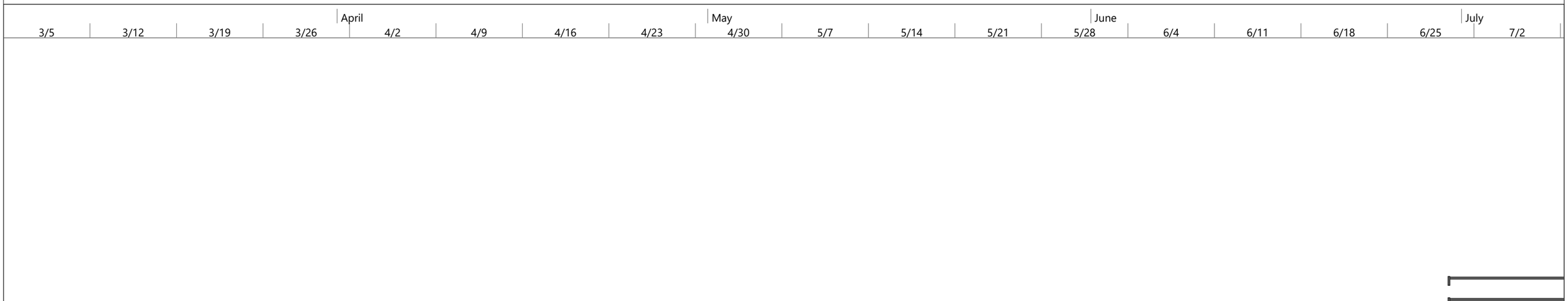
Elk Street Solar
Construction Schedule - Update 3/11/24



Project: Elk Street Construction
Date: Tue 3/19/24

Task	Project Summary	Manual Task	Start-only	Deadline
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Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone	

Elk Street Solar
Construction Schedule - Update 3/11/24

April				May					June					July				
3/5	3/12	3/19	3/26	4/2	4/9	4/16	4/23	4/30	5/7	5/14	5/21	5/28	6/4	6/11	6/18	6/25	7/2	

Project: Elk Street Construction
Date: Tue 3/19/24

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
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Elk Street Solar
Construction Schedule - Update 3/11/24

Project: Elk Street Construction
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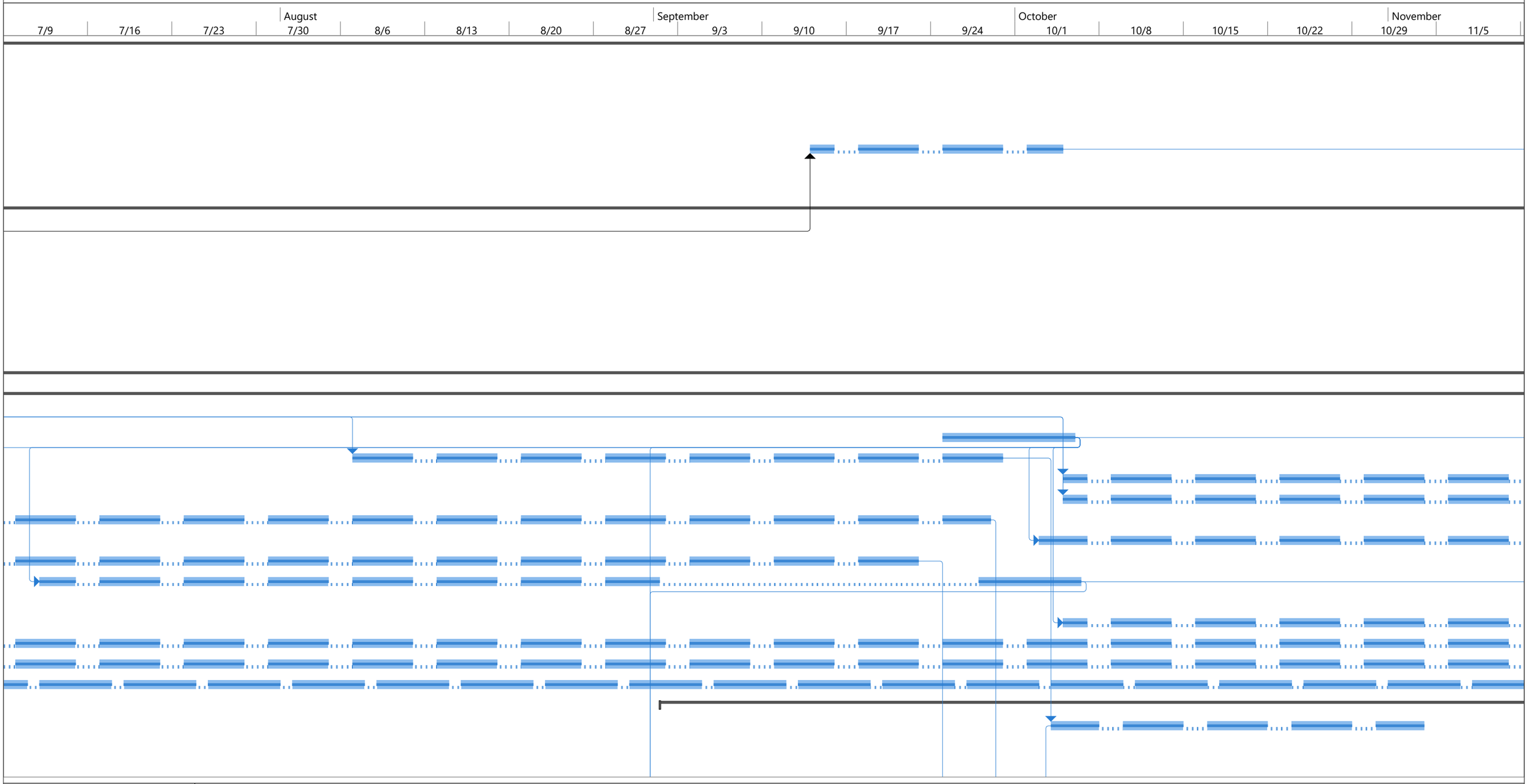
Elk Street Solar
Construction Schedule - Update 3/11/24



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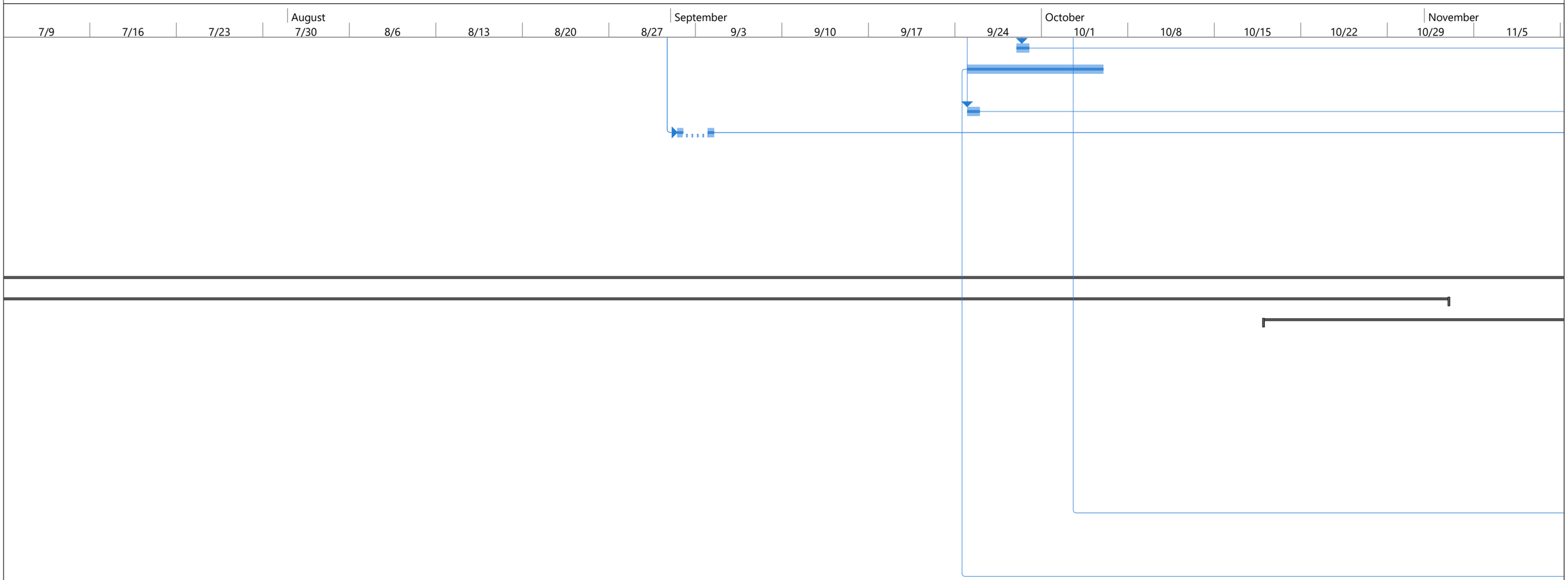
Elk Street Solar
Construction Schedule - Update 3/11/24



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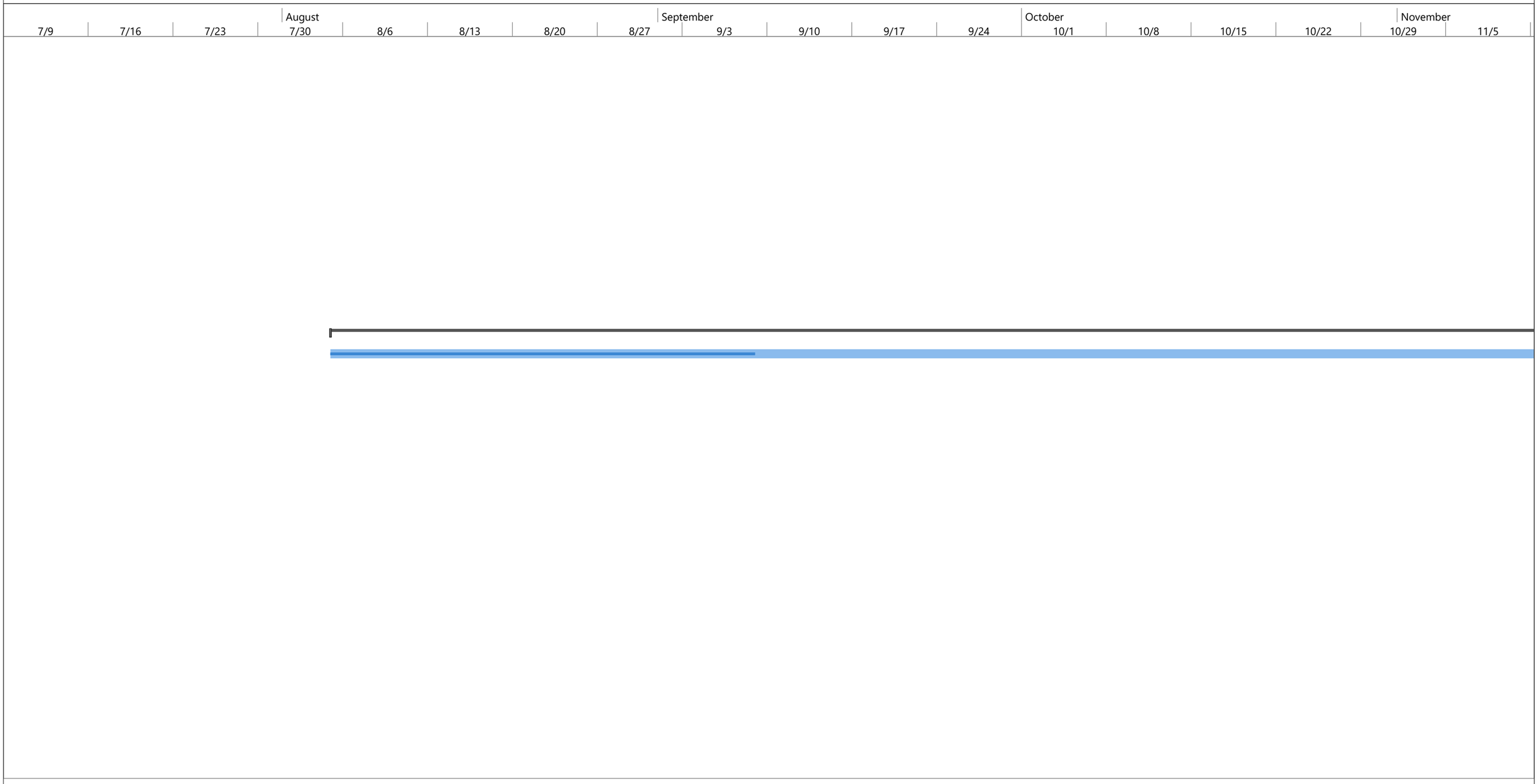
Elk Street Solar
Construction Schedule - Update 3/11/24



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Split	Inactive Task	Duration-only	Finish-only	Progress
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Summary	Inactive Summary	Manual Summary	External Milestone	

Elk Street Solar
Construction Schedule - Update 3/11/24

	August						September					October					November	
7/9	7/16	7/23	7/30	8/6	8/13	8/20	8/27	9/3	9/10	9/17	9/24	10/1	10/8	10/15	10/22	10/29	11/5	

Project: Elk Street Construction
Date: Tue 3/19/24

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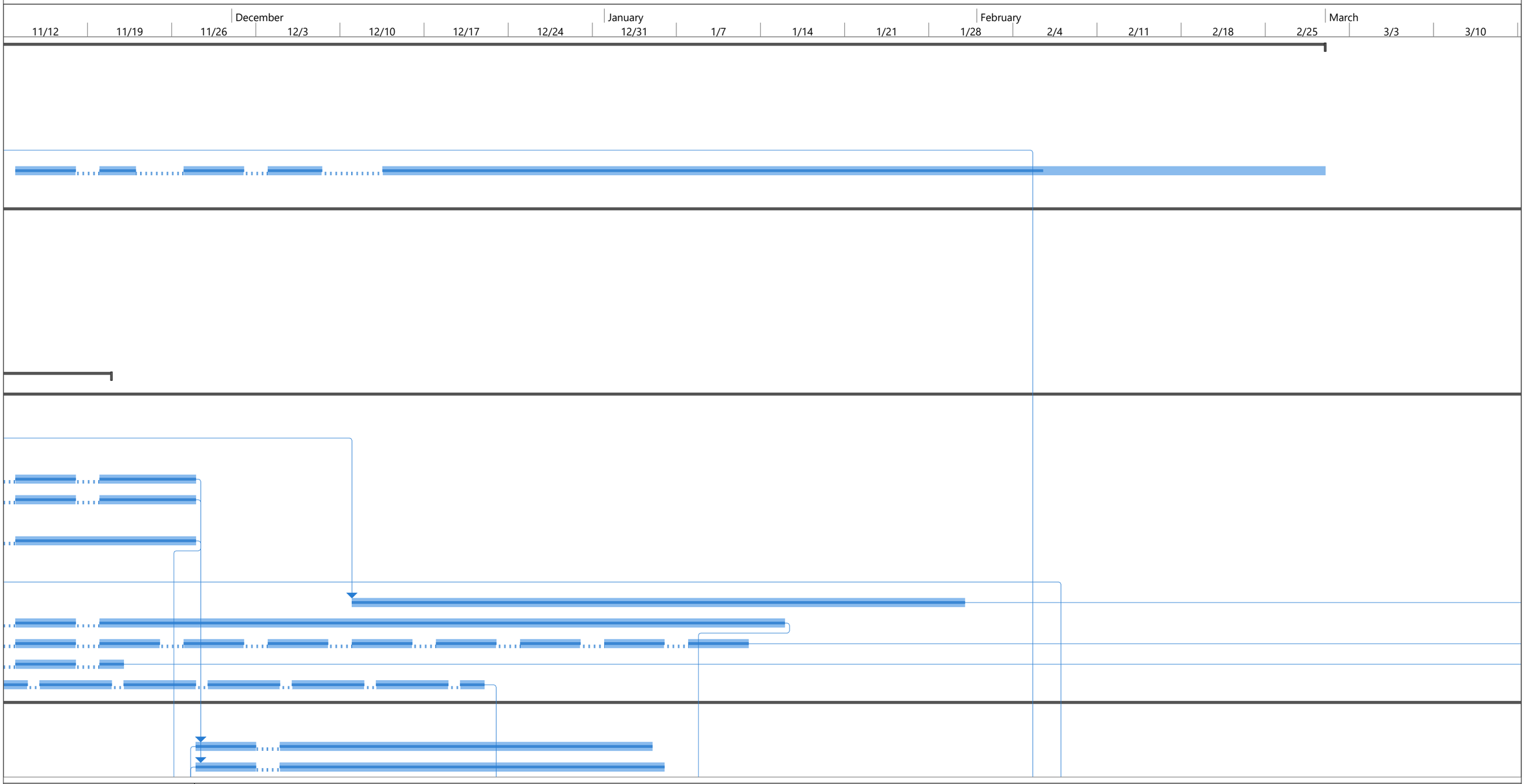
Elk Street Solar
Construction Schedule - Update 3/11/24



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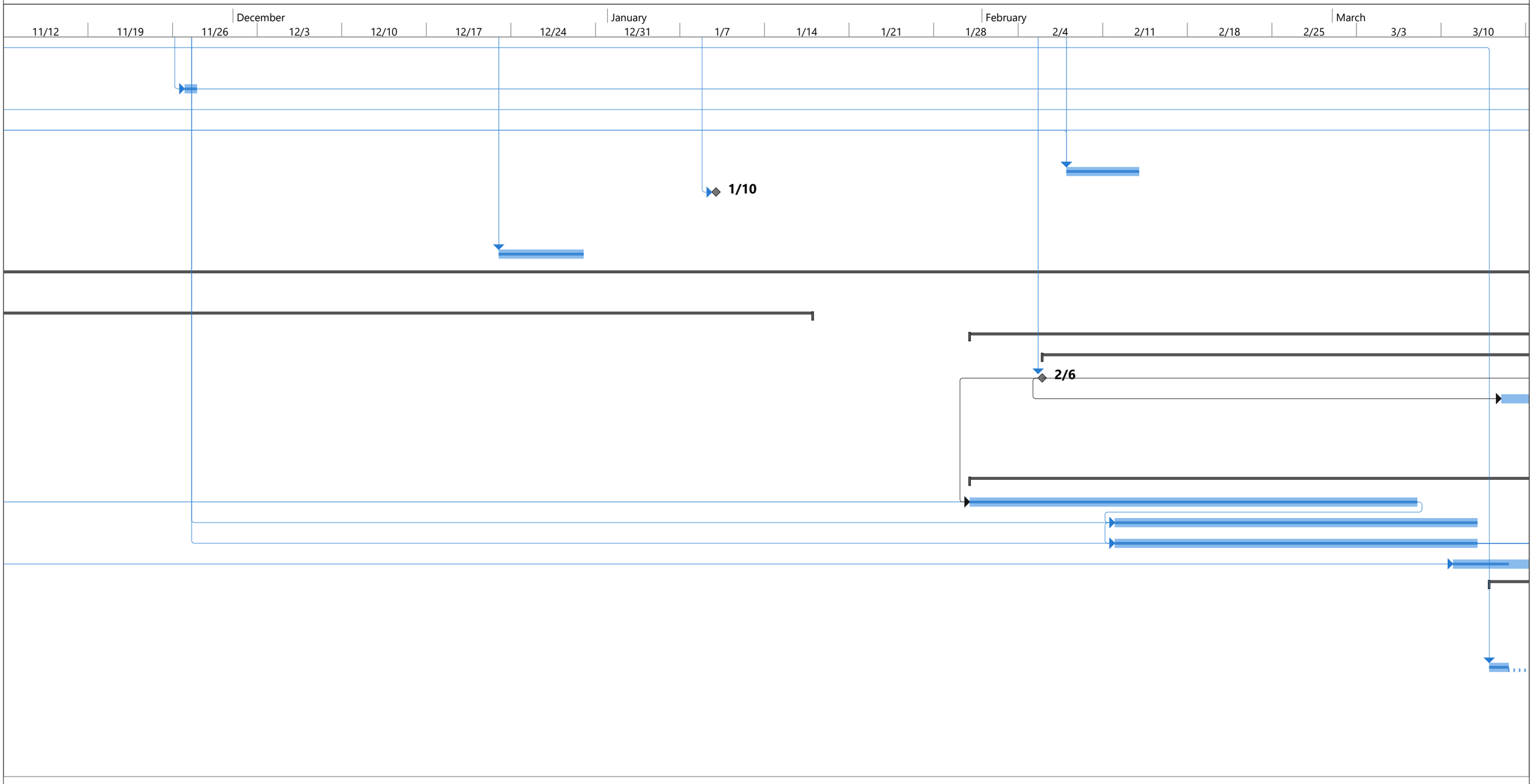
Elk Street Solar
Construction Schedule - Update 3/11/24



Project: Elk Street Construction
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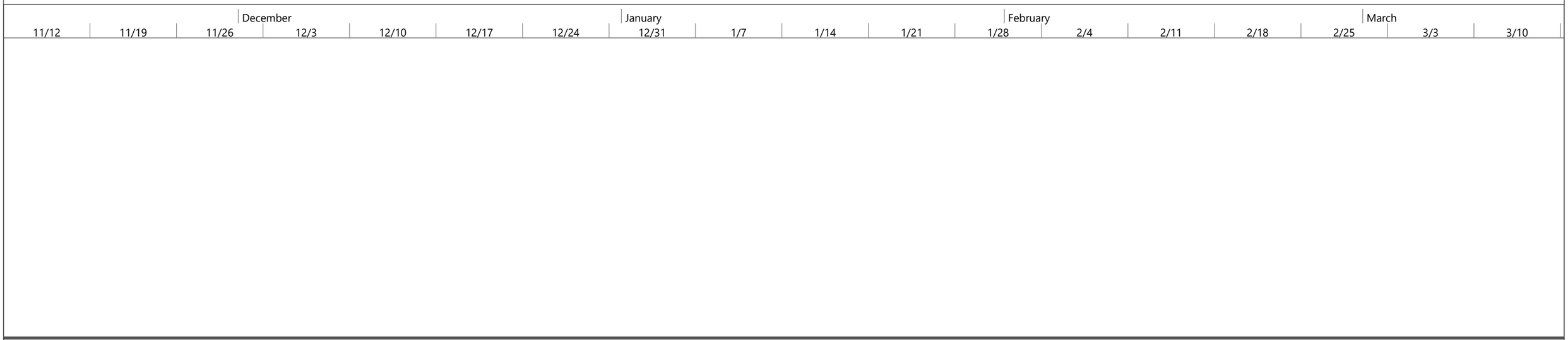
Elk Street Solar
Construction Schedule - Update 3/11/24



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Summary	Inactive Summary	Manual Summary	External Milestone		

Elk Street Solar
Construction Schedule - Update 3/11/24

December							January					February					March	
11/12	11/19	11/26	12/3	12/10	12/17	12/24	12/31	1/7	1/14	1/21	1/28	2/4	2/11	2/18	2/25	3/3	3/10

Project: Elk Street Construction
Date: Tue 3/19/24

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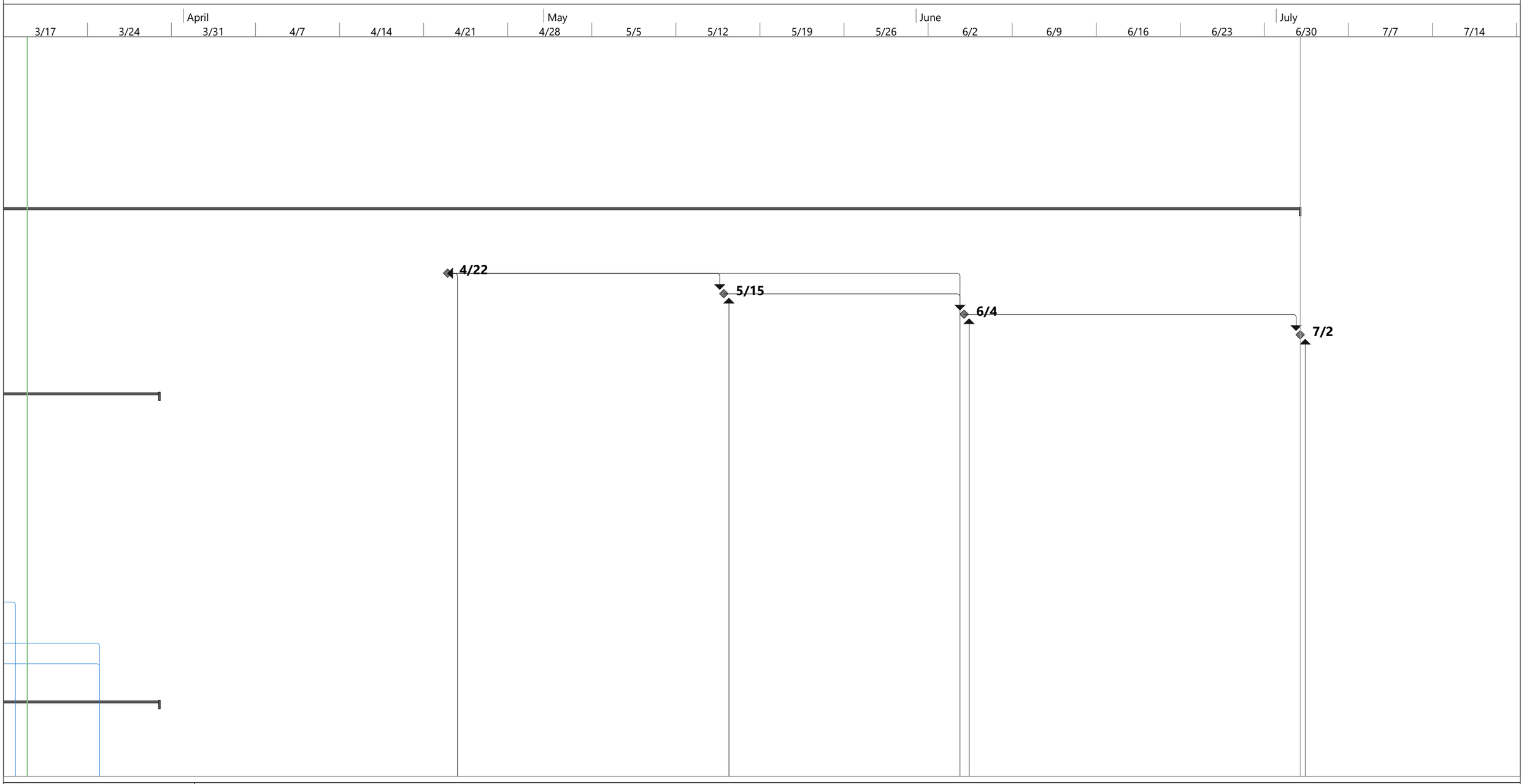
Elk Street Solar
Construction Schedule - Update 3/11/24



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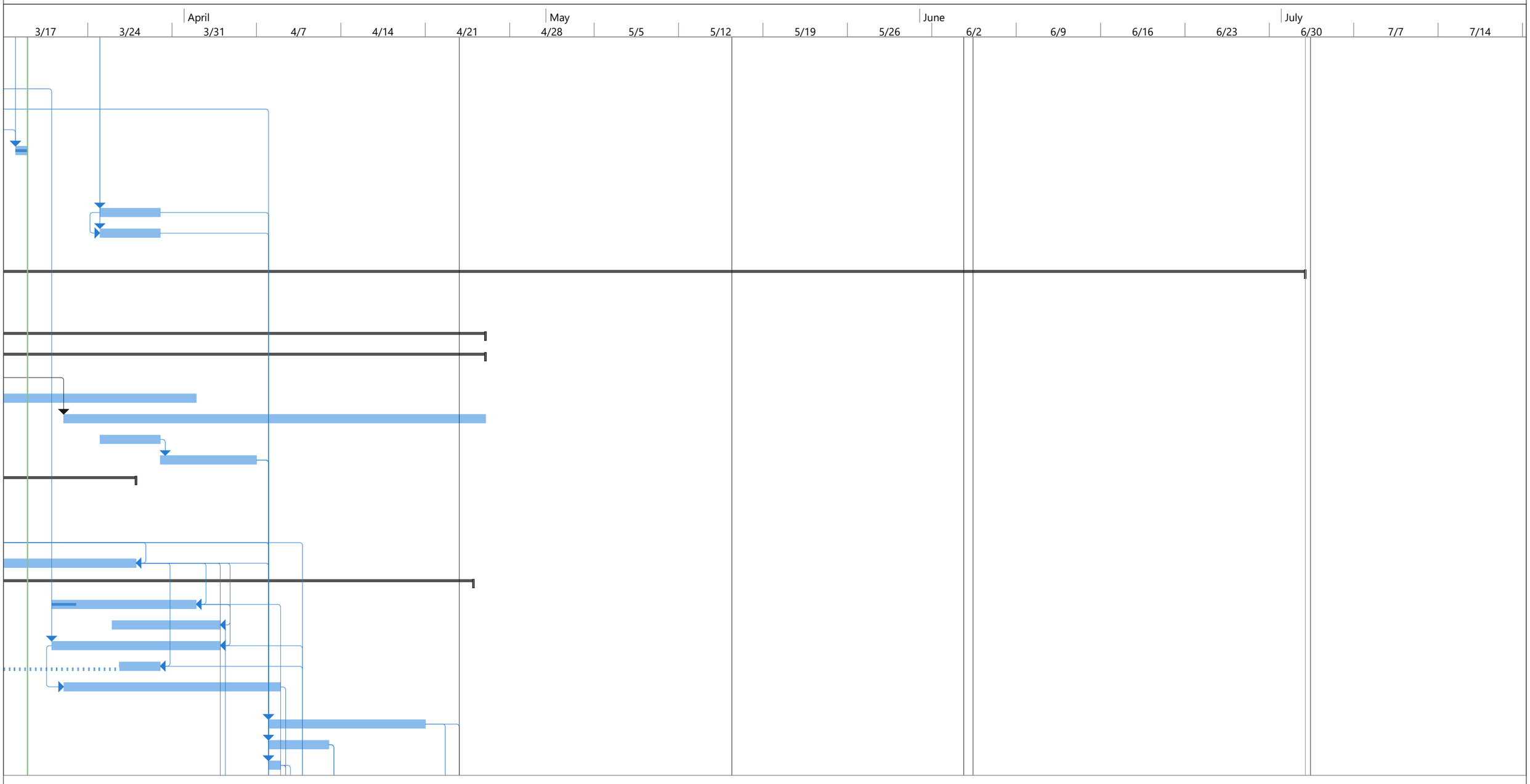
Elk Street Solar
Construction Schedule - Update 3/11/24



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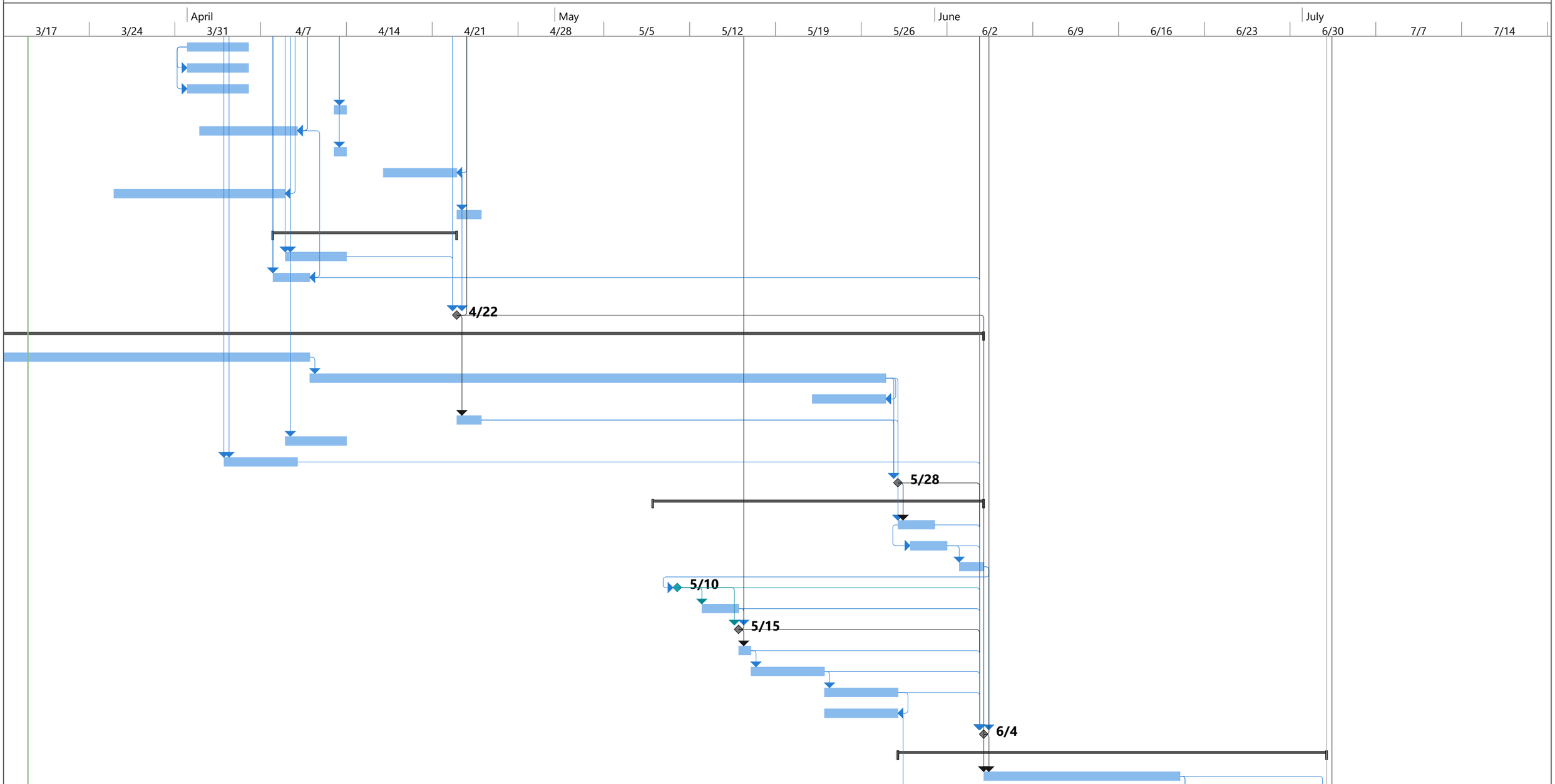
Elk Street Solar
Construction Schedule - Update 3/11/24



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	Split		Inactive Task		Duration-only		Finish-only		Progress	
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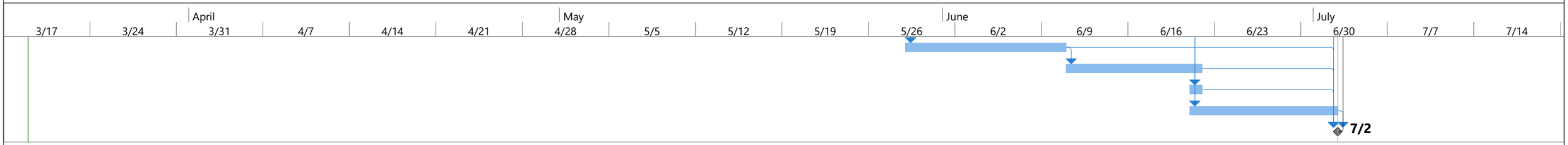
Elk Street Solar
Construction Schedule - Update 3/11/24



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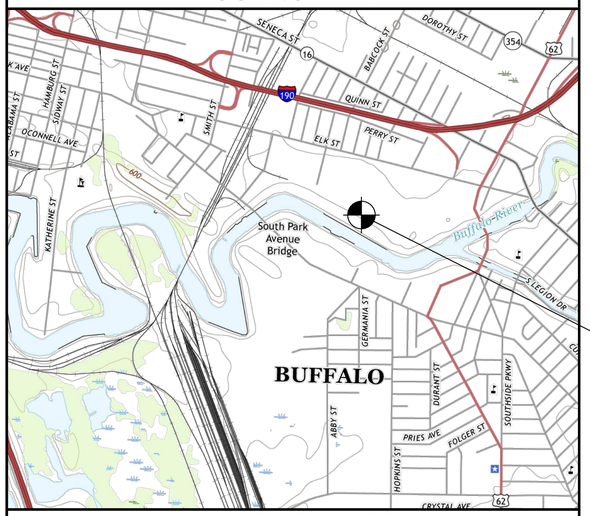
LOCATION MAP



SITE LOCATION

SCALE: 1" = 1,500'

ELK STREET
SOLAR DEVELOPMENT PROJECT

SITE ADDRESS: 503 ELK STREET, BUFFALO, NY 14210
TAX ID#: 123.13-1-2.111

PREPARED FOR:

INOVATEUS SOLAR LLC

19890 STATE LINE ROAD
SOUTH BEND, IN 46637

ENGINEER:

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

C&A #: 5566.02

DATE: SEPTEMBER 5, 2023
REVISED: MARCH 22, 2024

ISSUED FOR CONSTRUCTION - CIVIL

JENNIFER SUZANNE CRAWFORD LICENSED PROFESSIONAL ENGINEER 100556 STATE OF NEW YORK
3/22/2024

DRAWINGS:

STAKEHOLDERS:
EPC: INOVATEUS SOLAR, LLC
SURVEYOR: AMEC E&E P.C.
CIVIL & ELECTRICAL ENGINEER(S) OF RECORD: CRAWFORD & ASSOCIATES ENGINEERING & LAND SURVEYING, P.C.
STRUCTURAL ENGINEER(S) OF RECORD: KIMLEY-HORN AND ASSOCIATES, INC., TERRASMART, LLC.
PERMIT ENGINEER: LABELLA ASSOCIATES, P.C.
INTERCONNECTION DESIGN: JEM ENGINEERING SERVICES, LLC
SITE OWNER: ELK STREET COMMERCE PARK, LLC (ESCP)
POWER BUYER: COMMUNITY DISTRIBUTED GENERATION
UTILITY: NATIONAL GRID
PROJECT OWNER: ELK STREET SOLAR, LLC., A SUBSIDIARY OF BQ ENERGY

BROWNFIELD NOTES

1. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH THE CHANGE OF USE LETTER - WORK PLAN: 503, 623, 625, 635 ELK STREET, BUFFALO, NY (NYSDEC SITES #C915201D AND #C915201B) PREPARED BY LABELLA ASSOCIATES, P.C.
2. THE CONTRACTOR SHALL PREPARE AND SUBMIT TO INOVATEUS SOLAR A SITE-SPECIFIC HEALTH AND SAFETY PLAN AT LEAST TWO WEEKS PRIOR TO START OF CONSTRUCTION.
3. ACCESS TO EXISTING EXTRACTION WELLS MUST BE MAINTAINED ON SITE. NO STRUCTURES SHALL BE INSTALLED WITHIN A TEN (10) FOOT CLEARANCE FROM EXTRACTION WELLS.
4. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO ENSURE THAT THE PROPOSED CONSTRUCTION WORK ASSOCIATED WITH THE SOLAR PROJECT SHALL NOT IN ANY WAY DAMAGE THE IMPERMEABLE GSL LINER, EXTRACTION WELLS, EXTRACTION WELL PIPING, OR OTHER SITE FEATURES INSTALLED AS PART OF THE SITE REMEDIATION PROJECT. IF DAMAGE OCCURS TO ANY OF THE ABOVE-LISTED COMPONENTS, THE CONTRACTOR SHALL NOTIFY INOVATEUS SOLAR IMMEDIATELY. A WRITTEN PLAN FOR REPAIR OF THE COMPONENTS SHALL BE PREPARED AND APPROVED BY THE AUTHORITY HAVING JURISDICTION AND ANY REPAIR WORK SHALL BE PROMPTLY COMPLETED. ESCP RESERVES THE RIGHT TO REVIEW AND APPROVE ANY WRITTEN PLANS FOR REPAIR OF COMPONENTS. NOTE THAT ALL CORRESPONDENCE WITH NYSDEC SHALL BE THROUGH ESCP. NEITHER INOVATEUS SOLAR OR THE CONTRACTOR(S) SHALL COMMUNICATE DIRECTLY WITH NYSDEC WITHOUT ADVANCE WRITTEN AUTHORIZATION FROM ESCP.
5. MINIMIZE WORK AND VEHICLE TRAVEL IN 10' SET-BACK ZONES FROM EXTRACTION WELLS TO PREVENT ACCIDENTAL DAMAGE TO THESE STRUCTURES. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES, ALL MONITORING WELLS, AND OTHER EXISTING ABOVE-GROUND STRUCTURES OF THE PROJECT SITE SHALL BE FLAGGED FOR VISIBILITY AND PROTECTIVE BARRIERS SHALL BE PLACED AROUND SUCH STRUCTURES TO PREVENT DAMAGE BY VEHICLES ACCESSING THE CAP AREA.
6. CONTACT DIG-SAFE NEW YORK (1-800-962-7962) PRIOR TO EXCAVATING AS REQUIRED BY NYCRR. ALL OPERATORS PERFORMING DIGGING OPERATIONS SHALL BE CERTIFIED BY DSNY CERTIFIED EXCAVATOR PROGRAM AS REQUIRED BY LAW.
7. ANY PROPOSED EXCAVATION GREATER THAN 12" IN DEPTH WILL REQUIRE THE EXISTING DEMARCATION LAYER TO BE CUT AS NEEDED TO FACILITATE THE EXCAVATION. NEW DEMARCATION LAYER IS TO BE INSTALLED IN THE AFFECTED AREA DURING BACKFILL PRIOR TO REPLACING THE STONE COVER MATERIAL. SEE WORK PLAN FOR ADDITIONAL INFORMATION.
8. DO NOT USE STEEL PINS, GRADE STAKES, OR OTHER MARKING DEVICES THAT COULD PUNCTURE THE GSL LINER.
9. CAST THE FOUNDATION BLOCKS IN PLACE BY PUMPING CONCRETE OR WITH SPECIALIZED LOW GROUND PRESSURE EQUIPMENT (10 PSI MAXIMUM) TO CARRY CONCRETE TO THE BALLAST BLOCK LOCATION AS SPECIFIED BY THE RACKING MANUFACTURER. PRECAST FOOTINGS MAY BE USED AS LONG AS 10PSI GROUND PRESSURE LIMIT IS NOT VIOLATED.
10. IF WINTER WORK IS REQUIRED, THE CONTRACTOR SHALL SUBMIT A COLD-WEATHER CONCRETING PLAN SPECIFICALLY FOR THE INSTALLATION OF THE CONCRETE FOOTINGS. THE PLAN SHALL BE PREPARED IN GENERAL ACCORDANCE WITH ACI 306R GUIDE TO COLD WEATHER CONCRETING, OR OTHER EQUIVALENT INDUSTRIAL STANDARD. THE PLAN SHALL BE SUBMITTED TO INOVATEUS SOLAR AT LEAST TWO WEEKS PRIOR TO START OF CONSTRUCTION FOR APPROVAL.

PROCEDURAL NOTES:

1. PRIOR TO COMMENCEMENT OF ANY WORK, THE CONTRACTOR SHALL NOTIFY ENGINEER OF RECORDS OF ANY DISCREPANCIES NOTED TO EXISTING CONDITIONS, STRUCTURE, ELECTRICAL RUNS (SPECIFY EXISTING ITEMS), ETC. AMONG SITE CONDITIONS, MANUFACTURER RECOMMENDATIONS OR CODES, REGULATIONS OR RULES OF JURISDICTIONS HAVING AUTHORITY.
2. A PRE-CONSTRUCTION CONFERENCE IS TO BE HELD BETWEEN THE CONTRACTOR, DEVELOPER, ESCP, CITY OF BUFFALO BUILDING DEPARTMENT AND ANY OTHER INVOLVED PARTIES AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION.
3. ALL DIMENSIONS OF EXISTING CONDITIONS MUST BE VERIFIED PRIOR TO COMMENCING WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR ALL BRACING AND SHORING OF EQUIPMENT DURING INSTALLATION.
5. CONTRACTORS SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS, OSHA REQUIREMENTS AND SAFETY MEASURES ON SITE. THE EOR HAS NO OVERALL SUPERVISORY AUTHORITY AND NO DIRECT RESPONSIBILITY FOR THE SPECIFIC WORKING CONDITIONS OR FOR POSSIBLE EXISTING HAZARDS.
6. CONTRACTOR SHALL PAY FOR AND SECURE ALL PERMITS AND UNDERWRITERS CERTIFICATES.
7. ALL METERS, INSTRUMENTS, CABLE CONNECTION EQUIPMENT AND APPARATUS NECESSARY FOR PERFORMING ALL TESTS SHALL BE FURNISHED BY THE CONTRACTOR.
8. CONTRACTOR INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE ENGINEER OF RECORD AND ESCP FOR APPROVAL PRIOR TO MAKING THE CHANGES. ESCP RESERVES THE RIGHT TO REVIEW AND APPROVE ANY CONTRACTOR INITIATED CHANGES. APPROVED CHANGES SHALL REQUIRE A DRAWING REVISION TO MAINTAIN CONTROL OVER THE ENGINEER APPROVED DESIGN. DEVIATION FROM THESE PLANS PRIOR TO ENGINEERING APPROVAL PLACES ALL LIABILITY ON THE CONTRACTOR.
9. CONTRACTOR SHALL PROVIDE RED-LINED AS-BUILT DRAWINGS THAT INCLUDE ALL DEVIATIONS FROM THE DESIGN DRAWINGS.

GENERAL REQUIREMENTS:

1. ANY WASTE GENERATED AT THE SITE BY THIS WORK SHALL BE DISPOSED OF IN ACCORDANCE WITH THE SITE MANAGEMENT PLAN AND ANY APPLICABLE LOCAL, STATE OR FEDERAL LAWS. IN PARTICULAR, ANY WASTE SOIL GENERATED MUST BE CONTAINERIZED AND, IF REQUIRED, CATEGORIZED FOR OFFSITE DISPOSAL. MANIFESTS FOR SUCH DISPOSAL SHALL BE PROVIDED TO ESCP OR THEIR REPRESENTATIVE FOR INCLUSION IN THE ANNUAL PERIODIC REVIEW REPORT (PRR).
2. BULK STORAGE OF HAZARDOUS MATERIALS, INCLUDING BUT NOT LIMITED TO PETROLEUM PRODUCTS, SHALL NOT BE PERMITTED ON SITE WITHOUT THE EXPRESS WRITTEN APPROVAL OF ESCP.
3. ALL SYSTEMS INTENDED TO BE CONNECTED TO EXISTING FACILITIES AT ONE POINT OF COMMON COUPLING (PCC), SHALL BE IN COMPLIANCE WITH NEC ARTICLE 705.12 "POINT OF CONNECTION".
4. ALL DISCONNECTING COMBINERS, PULL/SPLICE BOXES, AND ENCLOSURES SHALL BE LISTED FOR ITS PURPOSE.
5. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS AND DIMENSIONS PRIOR TO PERFORMING ANY WORK.
6. CONTRACTOR IS RESPONSIBLE FOR ALL WASTE PRODUCED AND PROPER DISPOSAL FROM THE SITE.
7. THE PROJECT DESIGN WILL COMPLY WITH THE REQUIREMENTS OF APPLICABLE LOCAL ELECTRICAL CODES FOR THE PROJECT SITE.
8. ALL EQUIPMENT SHALL BE INSTALLED IN A SECURE AREA.
9. THE INVERTER FOR THE PROPOSED SOLAR ELECTRIC SYSTEM SHALL BE IDENTIFIED FOR USE IN SOLAR PHOTOVOLTAIC SYSTEMS.
10. ALUMINUM POWER CABLE, WIRE CONNECTORS, AND INSULATING AND CODING TAPE MANUFACTURERS SHALL BE APPROVED BY THE PROJECT OWNER PRIOR TO USAGE.
11. ALL DISCONNECTING COMBINERS SHALL BE SECURED FROM UNAUTHORIZED/UNQUALIFIED PERSONNEL BY LOCK OR LOCATION.
12. CONDUITS AND CABLES SHALL NOT ENTER THE TOP OF ANY OUTDOOR ENCLOSURE WITHOUT WRITTEN APPROVAL FROM THE PROJECT OWNER.
13. CONDUITS SHALL BE ORIENTED TO PREVENT WATER ENTRY INTO ENCLOSURES.
14. A LISTED FITTING SHALL BE USED TO PREVENT THE ENTRY OF MOISTURE WHEN TRANSITIONING FROM FREE AIR TO CONDUCTORS IN CONDUIT.
15. IF THE LOCATIONS OF SOME EQUIPMENT AND DEVICES AT WHICH CIRCUITS TERMINATE ARE APPROXIMATE ACCORDING TO THE PLAN SET, THEY SHALL BE FIELD VERIFIED BY THE CONTRACTOR. THE CONTRACTOR SHALL INSTALL EACH CIRCUIT TO THE INTENDED EQUIPMENT TERMINATION POINT WITHOUT ADDITIONAL CHARGES TO THE PROJECT OWNER, ALTHOUGH ITS FINAL LOCATION MAY SHIFT SOMEWHAT FROM THAT WHICH IS SHOWN.
16. AFTER ALL REQUIREMENTS OF THE DRAWINGS HAVE BEEN FULLY COMPLETED, REPRESENTATIVES OF THE PROJECT OWNER WILL INSPECT THE WORK. THE CONTRACTOR SHALL PROVIDE COMPETENT PERSONNEL TO DEMONSTRATE THE OPERATION OF ANY ITEM OR SYSTEM TO THE FULL SATISFACTION OF EACH REPRESENTATIVE. FINAL ACCEPTANCE OF THE WORK WILL BE MADE BY THE PROJECT OWNER AFTER DELIVERY OF RECEIPT OF APPROVAL AND RECOMMENDATION OF ACCEPTANCE FROM EACH REPRESENTATIVE.

REV #	DESCRIPTION	DATE	BY
1	UPDATES PER DEC COMMENTS	3/22/24	ESA

ELK STREET
SOLAR DEVELOPMENT PROJECT
CITY OF BUFFALO — ERIE COUNTY, NY

CONSTRUCTION NOTES

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

LICENSED PROFESSIONAL ENGINEER — STATE OF NEW YORK — JENNIFER SUZANNE CRAWFORD — 100556
9/5/2024

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DATE: 9/5/2023	DRAWN BY: TSB, JAT, ESA	N:\WORK\5566.02 Elk Street\DWG\5566.02 TITLE AND NOTES.dwg	
SCALE: AS SHOWN	DESIGNED BY: TSB, JAT	C&A JOB#: 5566.03	DRAWING: T-0.1
	CHECKED BY: TSB, JSC		
	APPROVED BY: JSC		

DRAWING NOTES:

1. BACKGROUND DRAWING INCLUDING PROPERTY BOUNDARIES, EXISTING SITE FEATURES, TOPOGRAPHY AND FEMA 1% ANNUAL CHANCE FLOOD ZONE FROM REMEDIATION DESIGN CAD FILES BY AMEC E&E P.C., DATED DECEMBER 2019, PROVIDED BY BQ ENERGY ON FEBRUARY 8, 2021.
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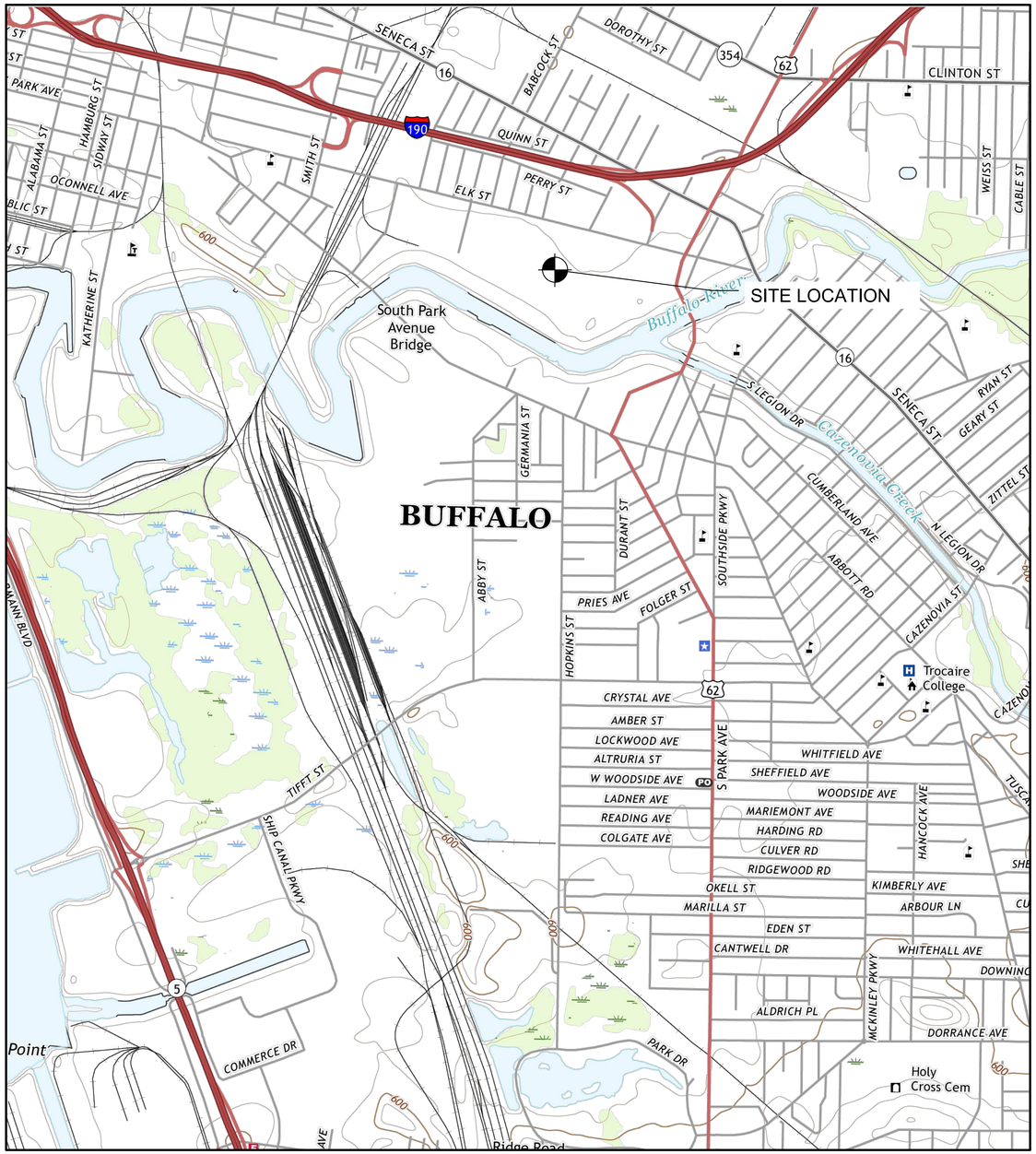
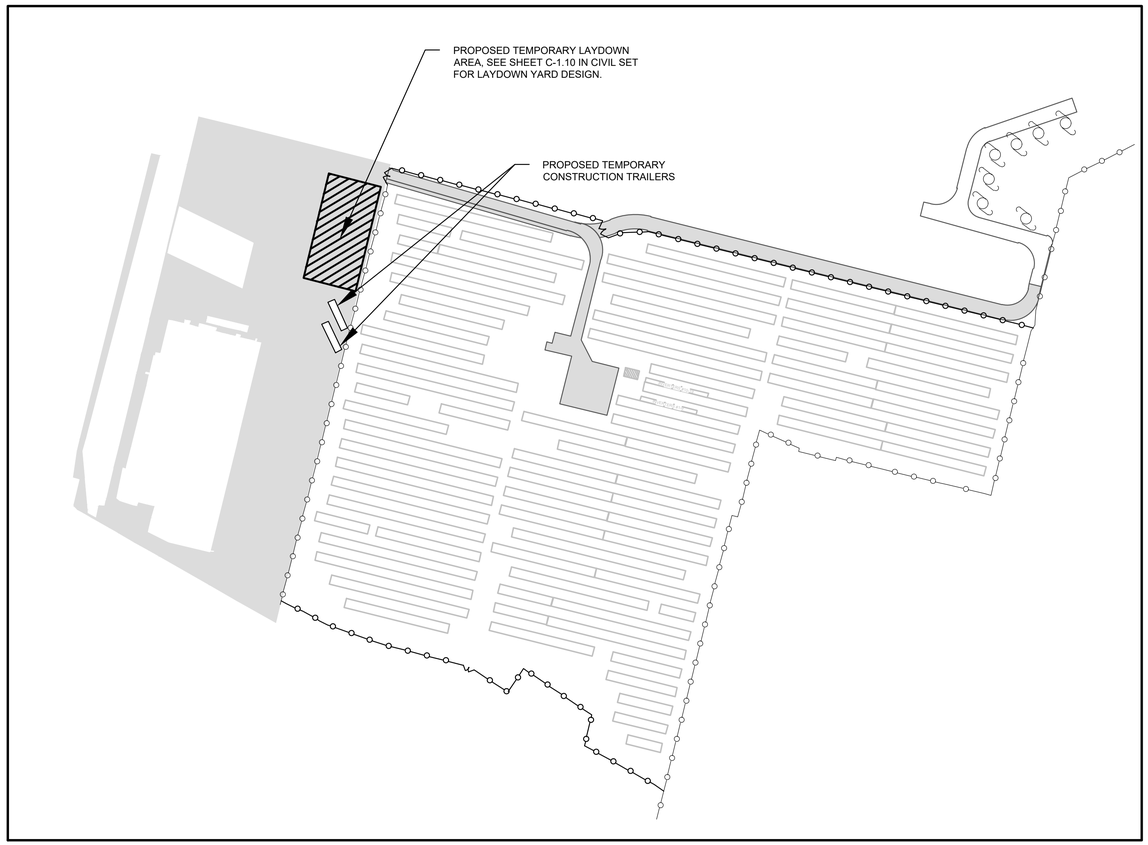
5. UTILITY EQUIPMENT IS FOR INFORMATION PURPOSES ONLY, NOT FOR CONSTRUCTION, AND MAY BE CHANGED BY THE UTILITY AT ANY TIME IN THE FUTURE.



LOCATION MAP
SCALE: 1" =1000'

GRAPHIC SCALE
1000 0 500 1000 2000 4000
(IN FEET)
1 inch = 1000 ft.



CONSTRUCTION STAGING AREA
SCALE: 1" =100'

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

REV #	DESCRIPTION	DATE	BY

ELK STREET
SOLAR DEVELOPMENT PROJECT
CITY OF BUFFALO — ERIE COUNTY, NY

CONSTRUCTION
ACCESS AND STAGING

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
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STATE OF NEW YORK · JENNIFER SUZANNE CRAWFORD · 110556 · LICENSED PROFESSIONAL ENGINEER
9/5/2024

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9/5/2023	DESIGNED BY: TSB, JAT	
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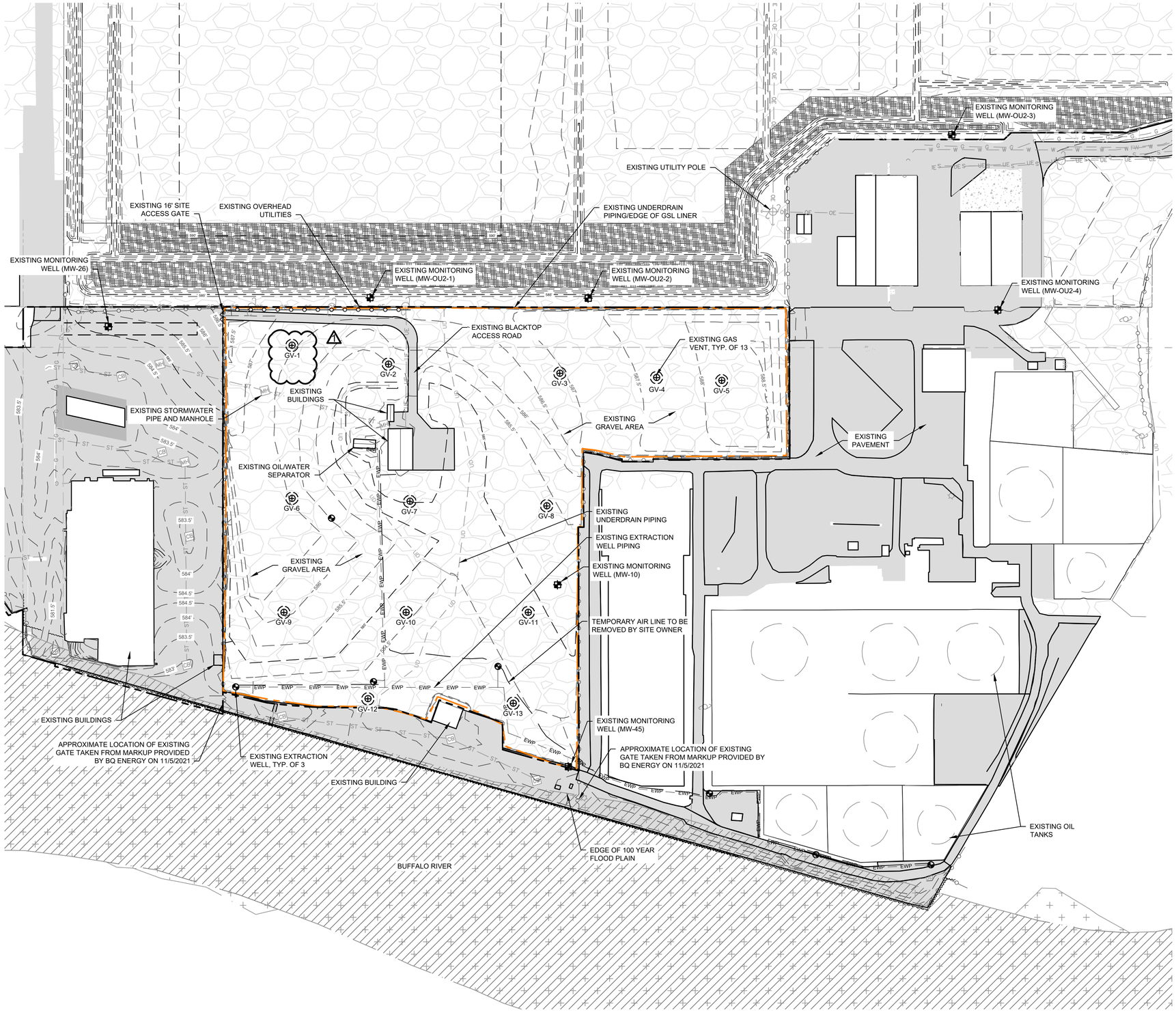
AS SHOWN	APPROVED BY: JSC	5566.03

DRAWING: T-0.2



EXISTING CONDITIONS SITE MAP

SCALE: 1"= 80'

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

DRAWING NOTES:

1. BACKGROUND DRAWING INCLUDING PROPERTY BOUNDARIES, EXISTING SITE FEATURES, TOPOGRAPHY AND FEMA 1% ANNUAL CHANCE FLOOD ZONE FROM REMEDIATION DESIGN CAD FILES BY AMEC E&E P.C., DATED DECEMBER 2019, PROVIDED BY BQ ENERGY ON FEBRUARY 8, 2021.
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LEGEND

- EXISTING CONTOUR .5' INTERVAL
- EXISTING CONTOUR 5' INTERVAL
- EXISTING LEASE LINE
- EXISTING ROAD EDGE
- EXISTING FENCE
- EXISTING STORMWATER LINE
- EXISTING GAS LINE
- EXISTING WATER LINE
- EXISTING FIRE WATER LINE
- EXISTING SEWER LINE
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND ELECTRIC
- EXISTING EXTRACTION WELL PIPE
- EXISTING TEMPORARY AIR LINE
- EXISTING UNDERDRAIN
- EXTENT OF GSL LINER/EXISTING UNDERDRAIN
- EXISTING STORMWATER MANHOLE
- EXISTING STORMWATER CATCH BASIN
- EXISTING BUILDING
- EXISTING/PROPOSED PAVEMENT HATCH
- REGULATORY FLOODWAY
- EXISTING CRUSHED STONE CAP MATERIAL
- EXISTING STORMWATER BASIN
- 100-YEAR FLOODPLAIN
- EXISTING EXTRACTION WELL
- EXISTING MONITORING WELL
- EXISTING GAS VENT W/ 5' AND 10' OFFSET
- EXISTING LIGHT POLE
- EXISTING UTILITY POLE
- EXISTING GUY WIRE

REV #	DESCRIPTION	DATE	BY
1	VENT LOCATION UPDATED	3/22/24	ESA

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

EXISTING CONDITIONS SITE MAP

INOVATEUS SOLAR LLC
19890 State Line Road
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fax: (518) 828-2723

STATE OF NEW YORK — JENNIFER SUZANNE GRAZIANO — LICENSED PROFESSIONAL ENGINEER — 150556 — 9/5/2024

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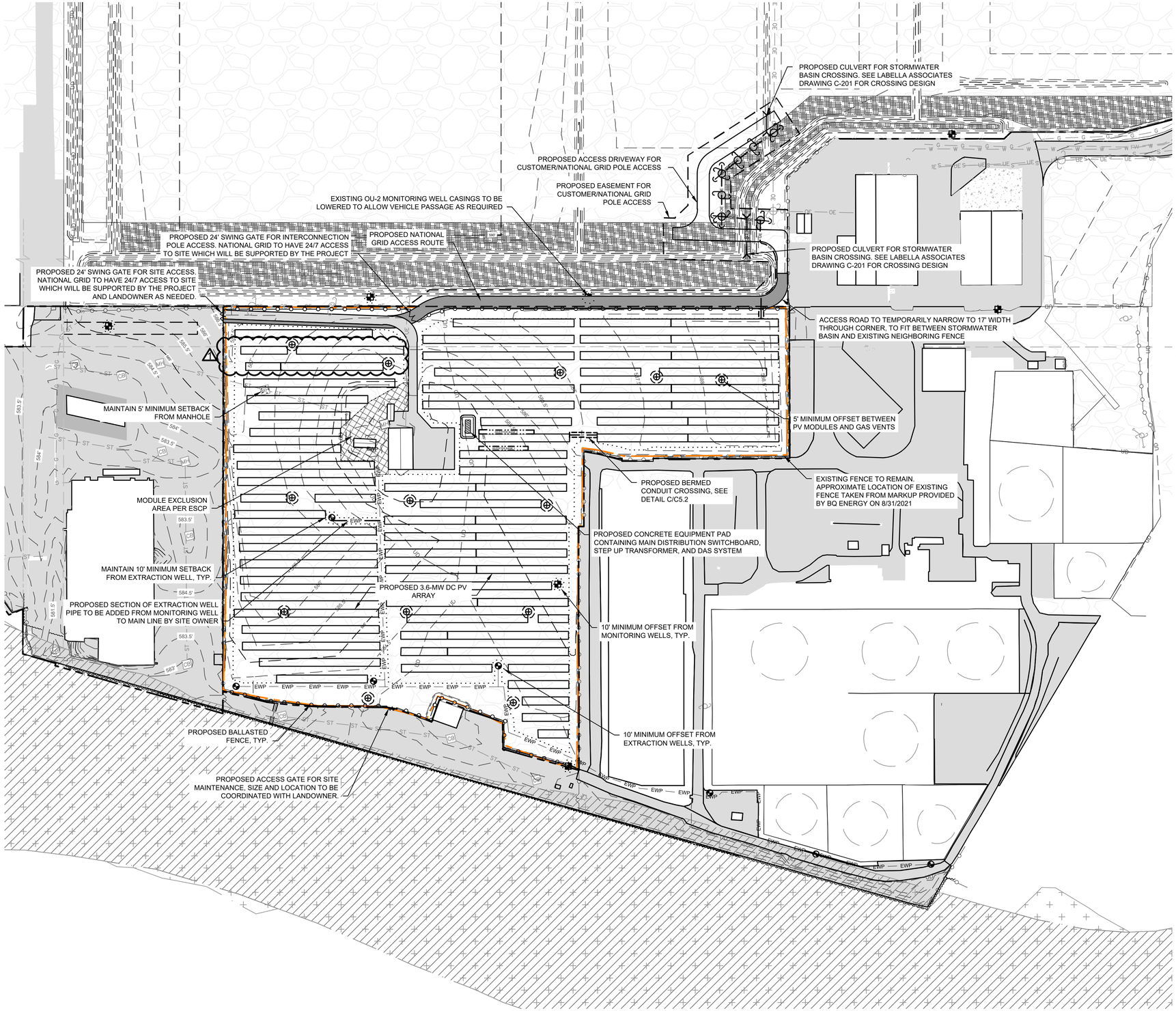
9/5/2023	DESIGNED BY: TSB, JAT	
SCALE	CHECKED BY: TSB, JSC	C&A JOB# 5566.03
AS SHOWN	APPROVED BY: JSC	DRAWING: C-1.0



PROPOSED CONDITIONS SITE PLAN

SCALE: 1"= 80'

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)

1 inch = 80 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

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LEGEND

- EXISTING CONTOUR .5' INTERVAL
- EXISTING CONTOUR 5' INTERVAL
- EXISTING LEASE LINE
- EXISTING/PROPOSED ROAD EDGE
- EXISTING/PROPOSED FENCE
- EXISTING STORMWATER LINE
- EXISTING GAS LINE
- EXISTING WATER LINE
- EXISTING FIRE WATER LINE
- EXISTING SEWER LINE
- EXISTING/PROPOSED OVERHEAD ELECTRIC
- EXISTING UNDERGROUND ELECTRIC
- PROPOSED UNDERGROUND ELECTRIC
- EXISTING/PROPOSED EXTRACTION WELL PIPE
- EXISTING UNDERDRAIN
- EXTENT OF GSL LINER/EXISTING UNDERDRAIN
- EXISTING/PROPOSED STORMWATER MANHOLE
- EXISTING/PROPOSED STORMWATER CATCH BASIN
- EXISTING BUILDING
- EXISTING PAVEMENT HATCH
- PROPOSED PAVEMENT HATCH
- FEMA REGULATORY FLOODWAY
- EXISTING CRUSHED STONE CAP MATERIAL
- EXISTING STORMWATER BASIN
- FEMA 1% ANNUAL CHANCE FLOOD ZONE HATCH
- EXISTING EXTRACTION WELL
- EXISTING MONITORING WELL
- EXISTING GAS VENT W/ 5' AND 10' OFFSET
- EXISTING/PROPOSED LIGHT POLE
- EXISTING/PROPOSED UTILITY POLE
- EXISTING/PROPOSED GUY WIRE
- APPROXIMATE EXISTING UTILITY EASEMENT
- PROPOSED CONCRETE EQUIPMENT PAD
- PROPOSED NATIONAL GRID ACCESS AREA
- PROPOSED BERMED CONDUIT CROSSING
- PV MODULE EXCLUSION AREA PER ESCP

REV #	DESCRIPTION	DATE	BY
1	VENT LOCATION UPDATE/NOTES UPDATE	3/22/24	ESA

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

PROPOSED CONDITIONS SITE PLAN

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

LICENSED PROFESSIONAL ENGINEER — JENNIFER SUZANNE JOHNSTON — 120556 — STATE OF NEW YORK

9/5/2024

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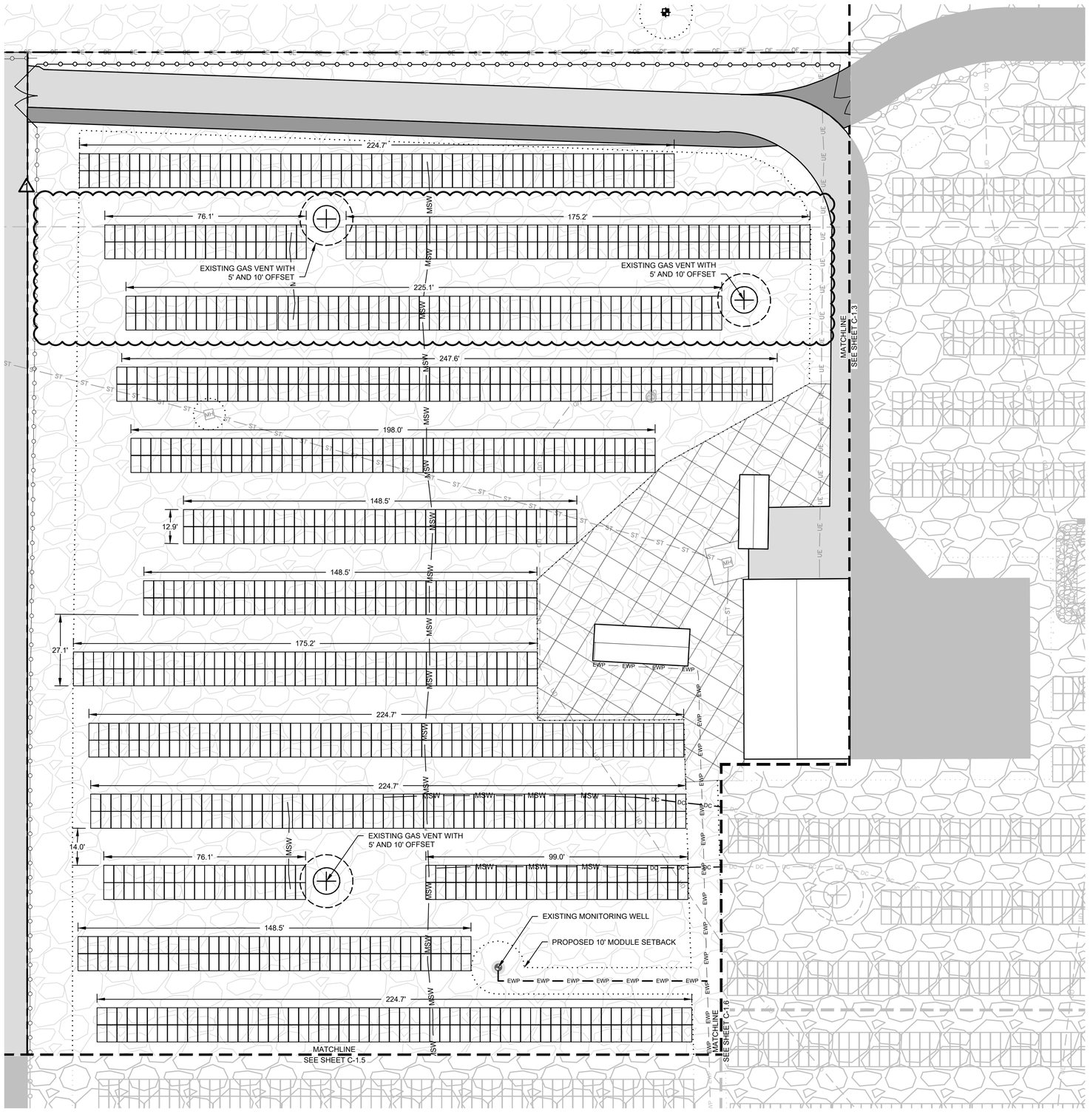
SCALE	AS SHOWN	DESIGNED BY: TSB, JAT	C&A JOB# 5566.03
		CHECKED BY: TSB, JSC	DRAWING: C-1.1
		APPROVED BY: JSC	



ARRAY DIMENSIONS - AREA 1

SCALE: 1"= 20'

DRAWING NOTES:

1. BACKGROUND DRAWING INCLUDING PROPERTY BOUNDARIES, EXISTING SITE FEATURES, TOPOGRAPHY AND FEMA 1% ANNUAL CHANCE FLOOD ZONE FROM REMEDIATION DESIGN CAD FILES BY AMEC E&E P.C., DATED DECEMBER 2019, PROVIDED BY BQ ENERGY ON FEBRUARY 8, 2021.
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LEGEND

- EXISTING/PROPOSED FENCE
- EXISTING UNDERGROUND ELECTRIC
- PROPOSED SHALLOW TRENCHING
- EXISTING/PROPOSED EXTRACTION WELL PIPING
- EXISTING UNDERDRAIN
- EXISTING STORMWATER LINE
- PROPOSED MESSENGER WIRE LOCATION
- EXISTING/PROPOSED STORMWATER MANHOLE
- EXISTING/PROPOSED STORMWATER CATCH BASIN
- EXISTING EXTRACTION WELL
- EXISTING MONITORING WELL
- EXISTING GAS VENT W/ 5' AND 10' OFFSET
- EXISTING/PROPOSED UTILITY POLE
- EXISTING/PROPOSED GUY WIRE
- PROPOSED MODULE SETBACK
- PROPOSED STRING INVERTER
- PROPOSED EQUIPMENT PAD
- PV MODULE EXCLUSION AREA PER ESCP

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

1 inch = 20 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

REV #	DESCRIPTION	DATE	BY
1	VENT LOCATION UPDATE/NOTES UPDATE	3/22/24	ESA

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

ARRAY DIMENSIONS - AREA 1

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STATE OF NEW YORK · JENNIFER SUZANNE CRAWFORD · 150556 · LICENSED PROFESSIONAL ENGINEER

9/5/2024

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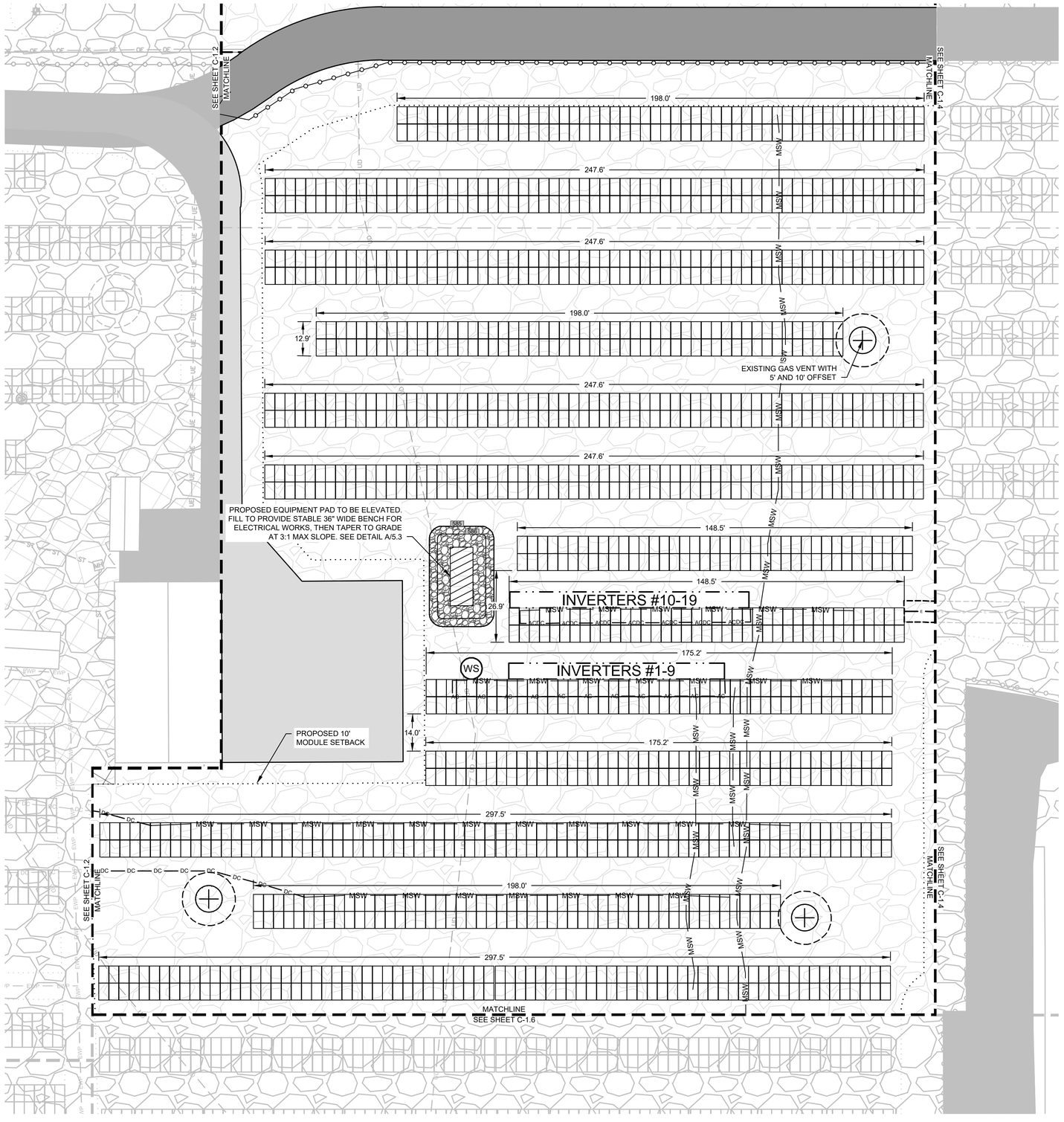

ARRAY DIMENSIONS - AREA 2

SCALE: 1"= 20'

DRAWING NOTES:

1. BACKGROUND DRAWING INCLUDING PROPERTY BOUNDARIES, EXISTING SITE FEATURES, TOPOGRAPHY AND FEMA 1% ANNUAL CHANCE FLOOD ZONE FROM REMEDIATION DESIGN CAD FILES BY AMEC E&E P.C., DATED DECEMBER 2019, PROVIDED BY BQ ENERGY ON FEBRUARY 8, 2021.
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LEGEND

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- EXISTING UNDERGROUND ELECTRIC
- PROPOSED SHALLOW TRENCHING
- EXISTING/PROPOSED EXTRACTION WELL PIPING
- EXISTING UNDERDRAIN
- EXISTING STORMWATER LINE
- PROPOSED MESSENGER WIRE LOCATION
- EXISTING/PROPOSED STORMWATER MANHOLE
- EXISTING/PROPOSED STORMWATER CATCH BASIN
- EXISTING EXTRACTION WELL
- EXISTING MONITORING WELL
- EXISTING GAS VENT W/ 5' AND 10' OFFSET
- EXISTING/PROPOSED UTILITY POLE
- EXISTING/PROPOSED GUY WIRE
- PROPOSED MODULE SETBACK
- PROPOSED STRING INVERTER
- PROPOSED EQUIPMENT PAD
- PV MODULE EXCLUSION AREA PER ESCP

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

REV #	DESCRIPTION	DATE	BY
1	NOTES UPDATE	3/22/24	ESA

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

ARRAY DIMENSIONS - AREA 2

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STATE OF NEW YORK · JENNIFER SUZANNE GRANCHELLI · LICENSED PROFESSIONAL ENGINEER · 150556 · 3/22/2024

DATE	DRAWN BY: TSB, JAT, ESA	H:\WORK\5566.02 Elk Street\DWG\5566.02 SITE - CIVIL.dwg
9/5/2023	DESIGNED BY: TSB, JAT	
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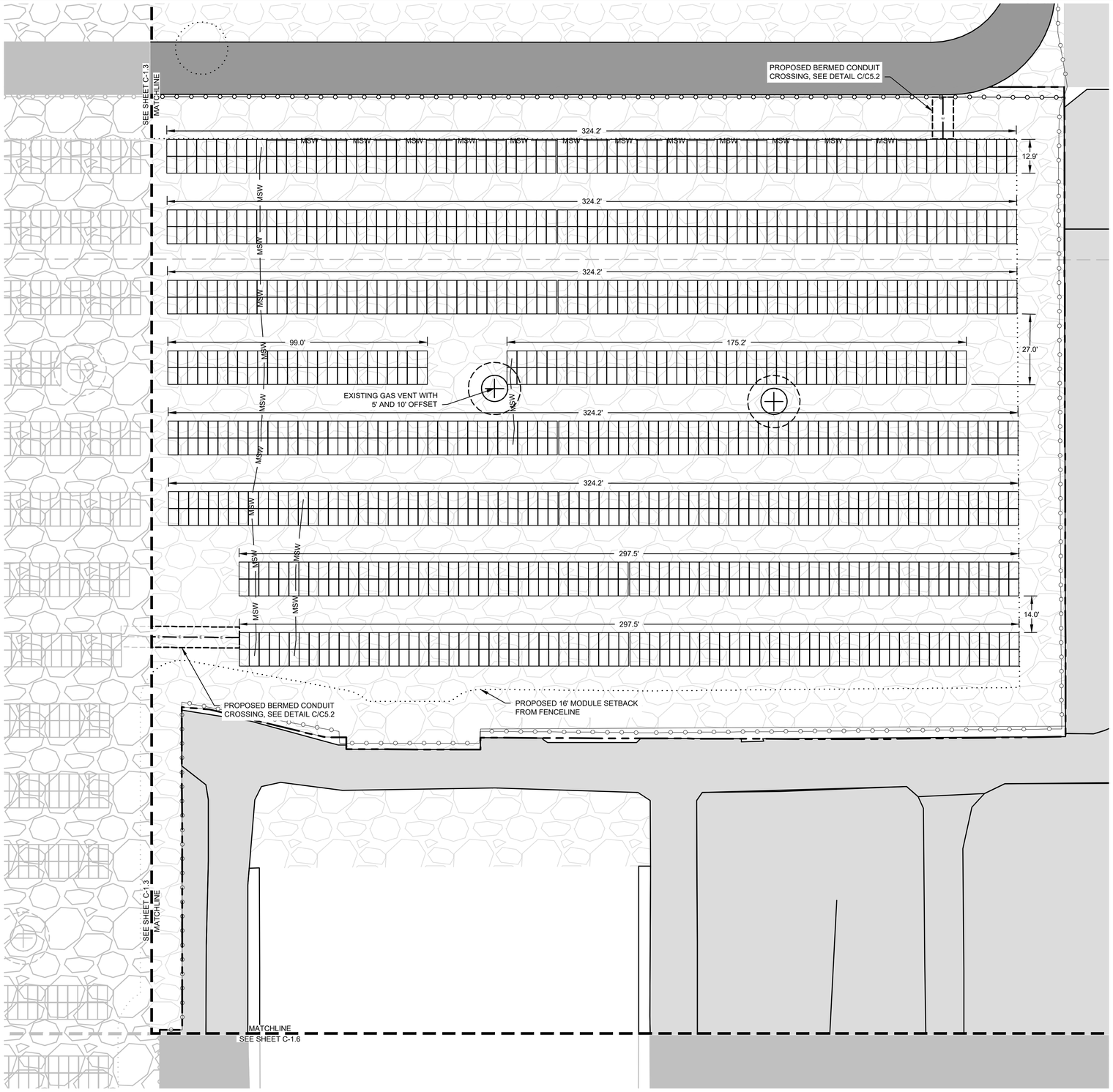

ARRAY DIMENSIONS - AREA 3

SCALE: 1"= 20'

DRAWING NOTES:

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LEGEND

- EXISTING/PROPOSED FENCE
- EXISTING UNDERGROUND ELECTRIC
- PROPOSED SHALLOW TRENCHING
- EXISTING/PROPOSED EXTRACTION WELL PIPING
- EXISTING UNDERDRAIN
- EXISTING STORMWATER LINE
- PROPOSED MESSENGER WIRE LOCATION
- EXISTING/PROPOSED STORMWATER MANHOLE
- EXISTING/PROPOSED STORMWATER CATCH BASIN
- EXISTING EXTRACTION WELL
- EXISTING MONITORING WELL
- EXISTING GAS VENT W/ 5' AND 10' OFFSET
- EXISTING/PROPOSED UTILITY POLE
- EXISTING/PROPOSED GUY WIRE
- PROPOSED MODULE SETBACK
- PROPOSED STRING INVERTER
- PROPOSED EQUIPMENT PAD
- PV MODULE EXCLUSION AREA PER ESCP

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

1 inch = 20 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

REV #	DESCRIPTION	DATE	BY
1	NOTES UPDATE	3/22/24	ESA

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

ARRAY DIMENSIONS - AREA 3

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

JENNIFER SUZANNE GRAWFORD — LICENSED PROFESSIONAL ENGINEER — 120556 — STATE OF NEW YORK

3/22/2024

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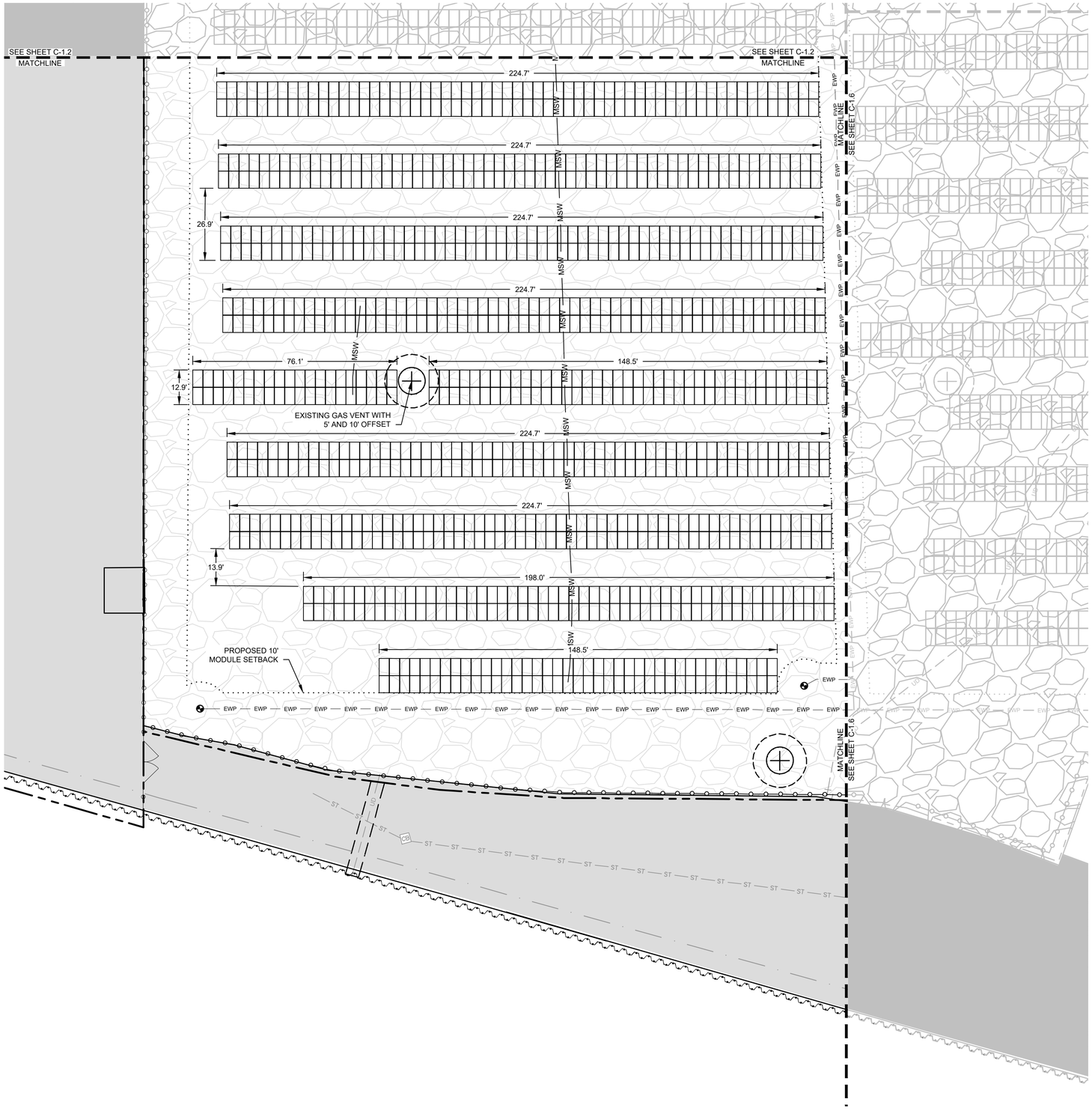
SCALE: AS SHOWN	DESIGNED BY: TSB, JAT	C&A JOB#: 5566.03	DRAWING: C-1.4
	CHECKED BY: TSB, JSC		
	APPROVED BY: JSC		



ARRAY DIMENSIONS - AREA 4

SCALE: 1"= 20'

DRAWING NOTES:

1. BACKGROUND DRAWING INCLUDING PROPERTY BOUNDARIES, EXISTING SITE FEATURES, TOPOGRAPHY AND FEMA 1% ANNUAL CHANCE FLOOD ZONE FROM REMEDIATION DESIGN CAD FILES BY AMEC E&E P.C., DATED DECEMBER 2019, PROVIDED BY BQ ENERGY ON FEBRUARY 8, 2021.
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4. 10 FOOT OFFSET FROM GAS VENTS FOR COMBINER BOXES, INVERTERS AND JUNCTIONS OTHER THAN PV SOURCE STRINGS. 5 FOOT OFFSETS FROM GAS VENTS FOR MODULES.
5. UTILITY EQUIPMENT IS FOR INFORMATION PURPOSES ONLY, NOT FOR CONSTRUCTION, AND MAY BE CHANGED BY THE UTILITY AT ANY TIME IN THE FUTURE.

LEGEND

- EXISTING/PROPOSED FENCE
- EXISTING UNDERGROUND ELECTRIC
- PROPOSED SHALLOW TRENCHING
- EXISTING/PROPOSED EXTRACTION WELL PIPING
- EXISTING UNDERDRAIN
- EXISTING STORMWATER LINE
- PROPOSED MESSENGER WIRE LOCATION
- EXISTING/PROPOSED STORMWATER MANHOLE
- EXISTING/PROPOSED STORMWATER CATCH BASIN
- EXISTING EXTRACTION WELL
- EXISTING MONITORING WELL
- EXISTING GAS VENT W/ 5' AND 10' OFFSET
- EXISTING/PROPOSED UTILITY POLE
- EXISTING/PROPOSED GUY WIRE
- PROPOSED MODULE SETBACK
- PROPOSED STRING INVERTER
- PROPOSED EQUIPMENT PAD
- PV MODULE EXCLUSION AREA PER ESCP

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

REV #	DESCRIPTION	DATE	BY
1	NOTES UPDATE	3/22/24	ESA

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

ARRAY DIMENSIONS - AREA 4

INOVATEUS SOLAR LLC
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STATE OF NEW YORK · JENNIFER SUZANNE CRAWFORD · LICENSED PROFESSIONAL ENGINEER · 120556

9/5/2024

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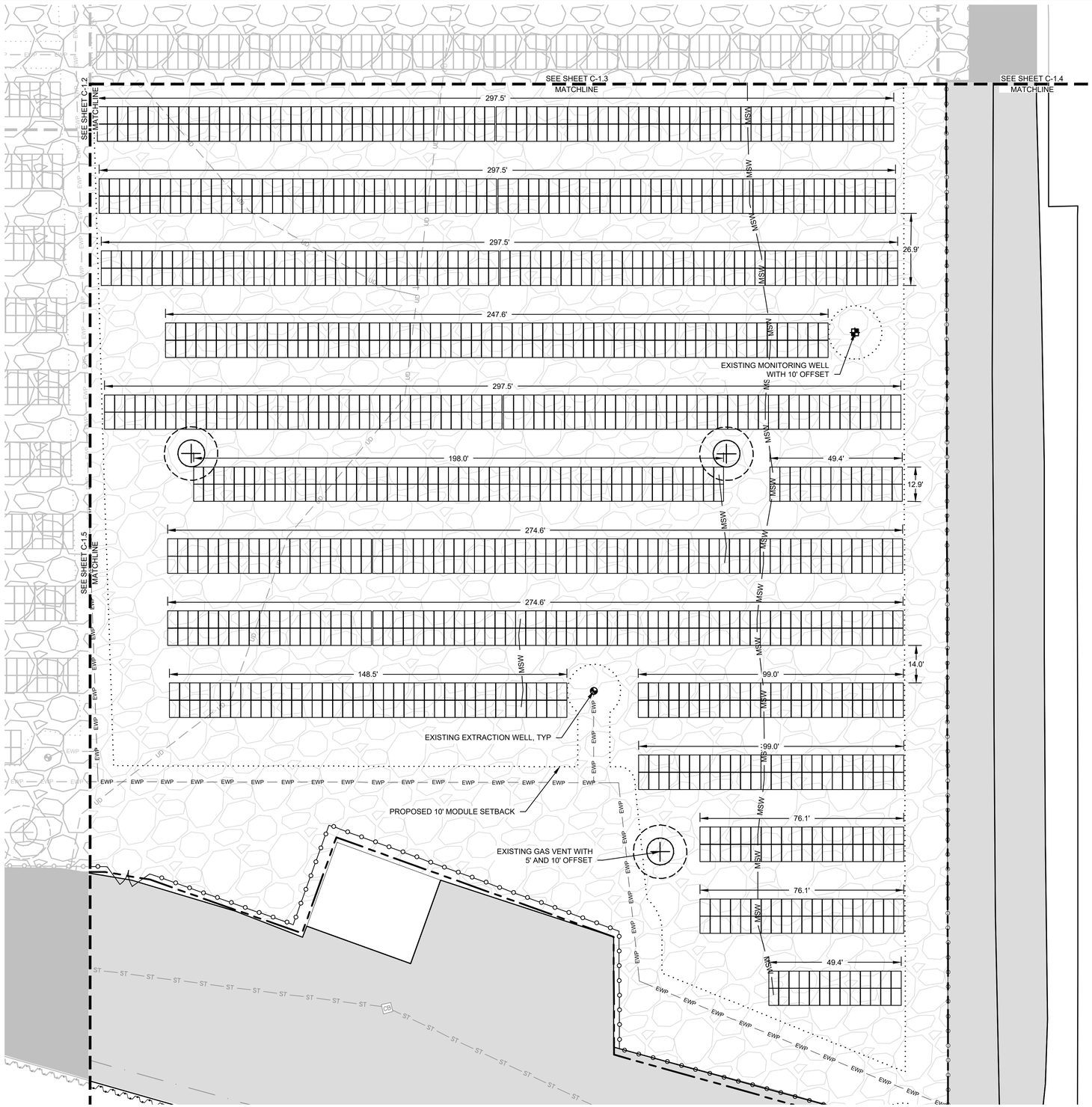
		APPROVED BY: JSC	
C&A JOB#	5566.03	DRAWING:	C-1.5



ARRAY DIMENSIONS - AREA 5

SCALE: 1"= 20'

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

DRAWING NOTES:

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LEGEND

- EXISTING/PROPOSED FENCE
- EXISTING UNDERGROUND ELECTRIC
- PROPOSED SHALLOW TRENCHING
- EXISTING/PROPOSED EXTRACTION WELL PIPING
- EXISTING UNDERDRAIN
- EXISTING STORMWATER LINE
- PROPOSED MESSENGER WIRE LOCATION
- EXISTING/PROPOSED STORMWATER MANHOLE
- EXISTING/PROPOSED STORMWATER CATCH BASIN
- EXISTING EXTRACTION WELL
- EXISTING MONITORING WELL
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- PROPOSED STRING INVERTER
- PROPOSED EQUIPMENT PAD
- PV MODULE EXCLUSION AREA PER ESCP

REV #	DESCRIPTION	DATE	BY
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ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

ARRAY DIMENSIONS - AREA 5

INOVATEUS SOLAR LLC
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STATE OF NEW YORK · JENNIFER SUZANNE CROWLEY · LICENSED PROFESSIONAL ENGINEER · 130556

3/22/2024

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SCALE	CHECKED BY: TSB, JSC	C&A JOB# 5566.03
AS SHOWN	APPROVED BY: JSC	DRAWING: C-1.6

DRAWING NOTES:

1. BACKGROUND DRAWING INCLUDING PROPERTY BOUNDARIES, EXISTING SITE FEATURES, TOPOGRAPHY AND FEMA 1% ANNUAL CHANCE FLOOD ZONE FROM REMEDIATION DESIGN CAD FILES BY AMEC E&E P.C., DATED DECEMBER 2019, PROVIDED BY BQ ENERGY ON FEBRUARY 8, 2021.
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LEGEND

- EXISTING LEASE LINE
- EXISTING/PROPOSED FENCE
- EXISTING/PROPOSED ACCESS GATE

PROPOSED 24' SWING GATE FOR INTERCONNECTION POLE ACCESS. NATIONAL GRID TO HAVE 24/7 ACCESS TO SITE WHICH WILL BE SUPPORTED BY THE PROJECT

303.3'

35.4'

554.1'

20.8'

EDGE OF LEASE AREA. PROPOSED FENCE TO BE INSTALLED ON LEASE LINE IN THIS SECTION (LINES SHOWN OFFSET FOR CLARITY)

PROPOSED BALLASTED FENCE, TYP. SEE KIMLEY HORN SHEET S501 FOR DESIGN DETAILS

APPROX. 960 L.F. OF BALLASTED FENCE TO BE INSTALLED IN THIS SECTION

EXISTING 16' ACCESS GATE TO BE REPLACED WITH 24' SWING GATE FOR SITE ACCESS. NATIONAL GRID TO HAVE 24/7 ACCESS TO SITE WHICH WILL BE SUPPORTED BY THE PROJECT AND LANDOWNER AS NEEDED.

16' CLEARANCE BETWEEN FENCE AND PV MODULES, TYP.

APPROXIMATE LOCATION OF EXISTING FENCE TAKEN FROM MARKUP PROVIDED BY BQ ENERGY ON 8/31/2021

APPROXIMATE LOCATION OF EXISTING FENCE TAKEN FROM MARKUP PROVIDED BY BQ ENERGY ON 8/31/2021

APPROX. 675 L.F. OF BALLASTED FENCE TO BE INSTALLED IN THIS SECTION

EDGE OF PROPERTY BOUNDARY. PROPOSED FENCE TO BE SET BACK 2' FROM PROPERTY LINE IN THIS SECTION

74.6'

83.5'

103.8'

56.6'

40.0'

115.4'

43.4'

127.5'

16' CLEARANCE BETWEEN FENCE AND PV MODULES, TYP.

APPROXIMATE LOCATION OF EXISTING GATE TAKEN FROM MARKUP PROVIDED BY BQ ENERGY ON 11/5/2021

PROPOSED ACCESS GATE FOR SITE MAINTENANCE, SIZE AND LOCATION TO BE COORDINATED WITH LANDOWNER

PROPOSED BALLASTED FENCE, TYP. SEE KIMLEY HORN SHEET S501 FOR DESIGN DETAILS

APPROXIMATE LOCATION OF EXISTING GATE TAKEN FROM MARKUP PROVIDED BY BQ ENERGY ON 11/5/2021

FENCE DIMENSIONS

SCALE: 1"= 50'

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)

1 inch = 50 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

REV #	DESCRIPTION	DATE	BY
1	NOTES UPDATE	3/22/24	ESA

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

FENCE DIMENSIONS

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

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www.crawfordandassociates.com fax: (518) 828-2723

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9/5/2024

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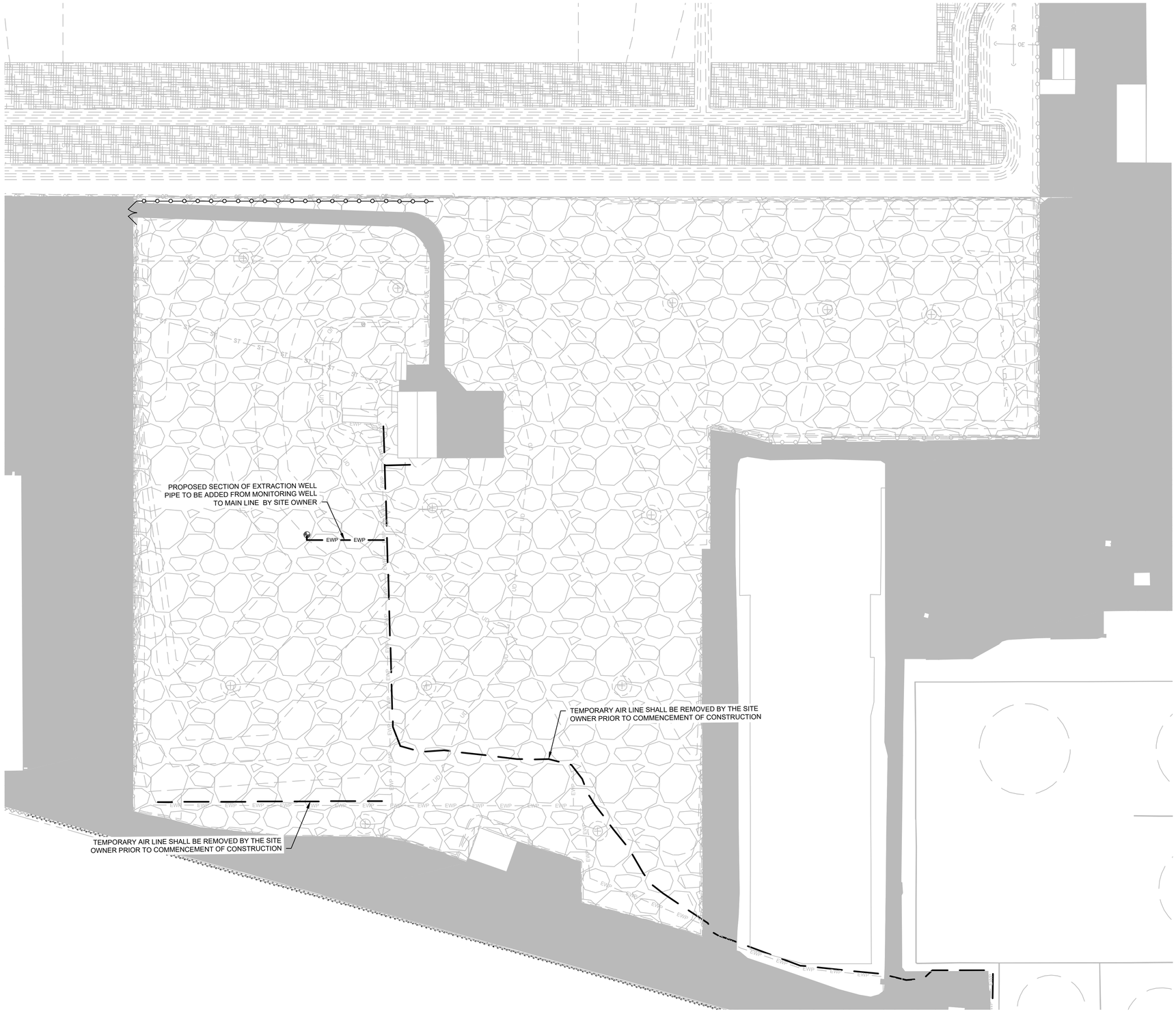

SITE PREPARATION PLAN

SCALE: 1"= 50'

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)

1 inch = 50 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F

DRAWING NOTES:

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LEGEND

- EXISTING TEMPORARY AIR LINE
- EWP — EWP — EXISTING/PROPOSED EXTRACTION WELL PIPE

REV #	DESCRIPTION	DATE	BY
1	NOTES UPDATE	3/22/24	ESA

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

SITE PREPARATION PLAN

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

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STATE OF NEW YORK — LICENSED PROFESSIONAL ENGINEER — JENNIFER SUZANNE CRAWFORD — 110556

3/22/2024

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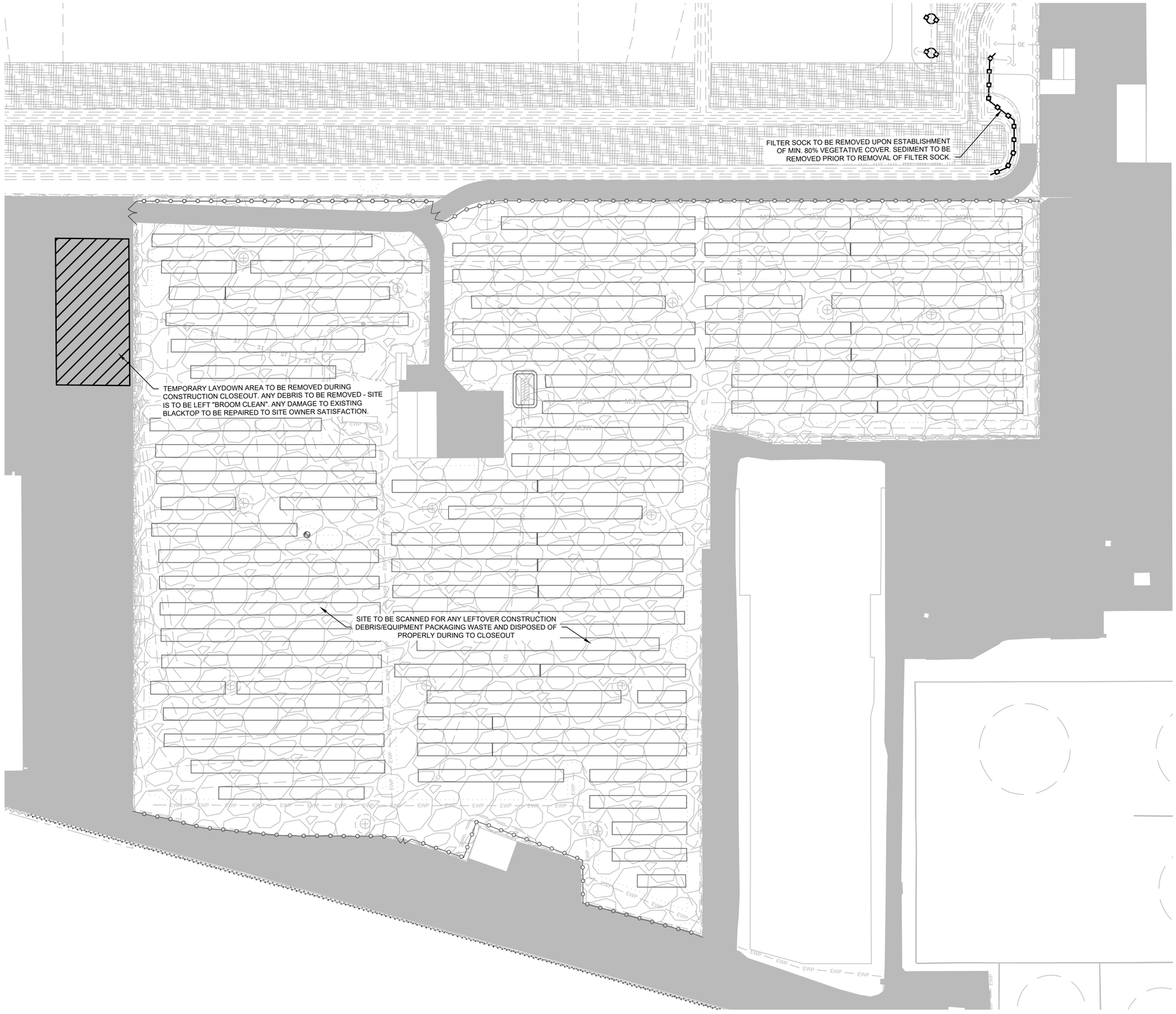
DRAWING:	C-1.8



SITE RESTORATION PLAN

SCALE: 1"= 50'

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

DRAWING NOTES:

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LEGEND

COMPOSITE FILTER SOCK

TEMPORARY LAYDOWN AREA

NOTES:

1. CONCRETE WASHOUT LOCATED AT "45 ORLANDO STREET, BUFFALO, NY" TO BE REMOVED FROM SITE PER NOTES IN DETAIL A/C-5.0 UPON COMPLETION OF ALL CONCRETE PLACEMENT.

REV #	DESCRIPTION	DATE	BY
1	NOTES UPDATE	3/22/24	ESA

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

SITE RESTORATION PLAN

INOVATEUS SOLAR LLC
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DRAWING:	C-1.9

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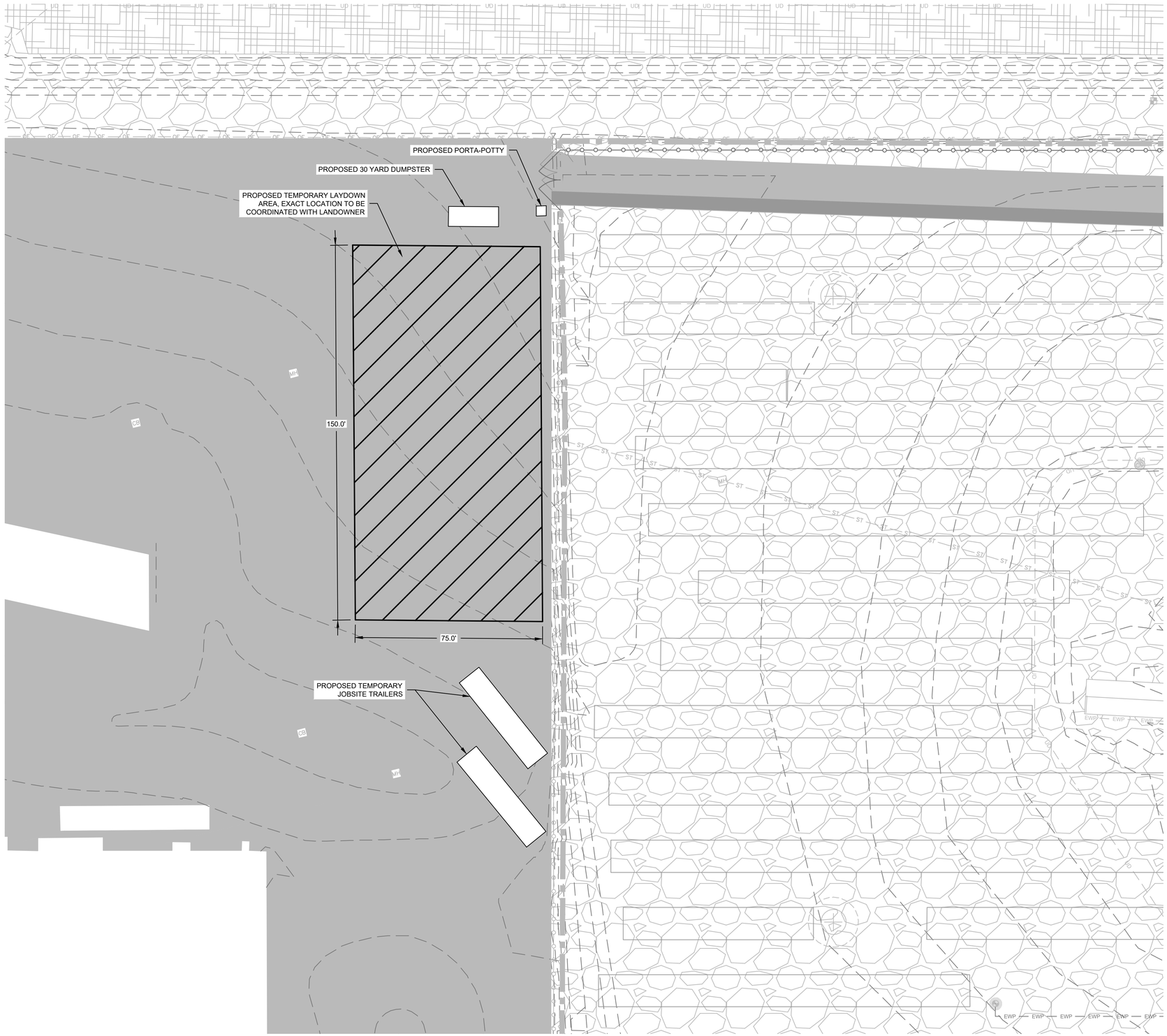

PROPOSED LAYDOWN YARD DESIGN

SCALE: 1"= 20'

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

1 inch = 20 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F

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LEGEND

- PROPOSED TEMPORARY CONSTRUCTION FACILITY
- PROPOSED TEMPORARY LAYDOWN AREA

JENNIFER SUZANNE CONNOLLY — LICENSED PROFESSIONAL ENGINEER — 110556 — STATE OF NEW YORK

3/22/2024

REV #	DESCRIPTION	DATE	BY
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ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

PROPOSED LAYDOWN YARD DESIGN

INOVATEUS SOLAR LLC
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South Bend, IN 46637

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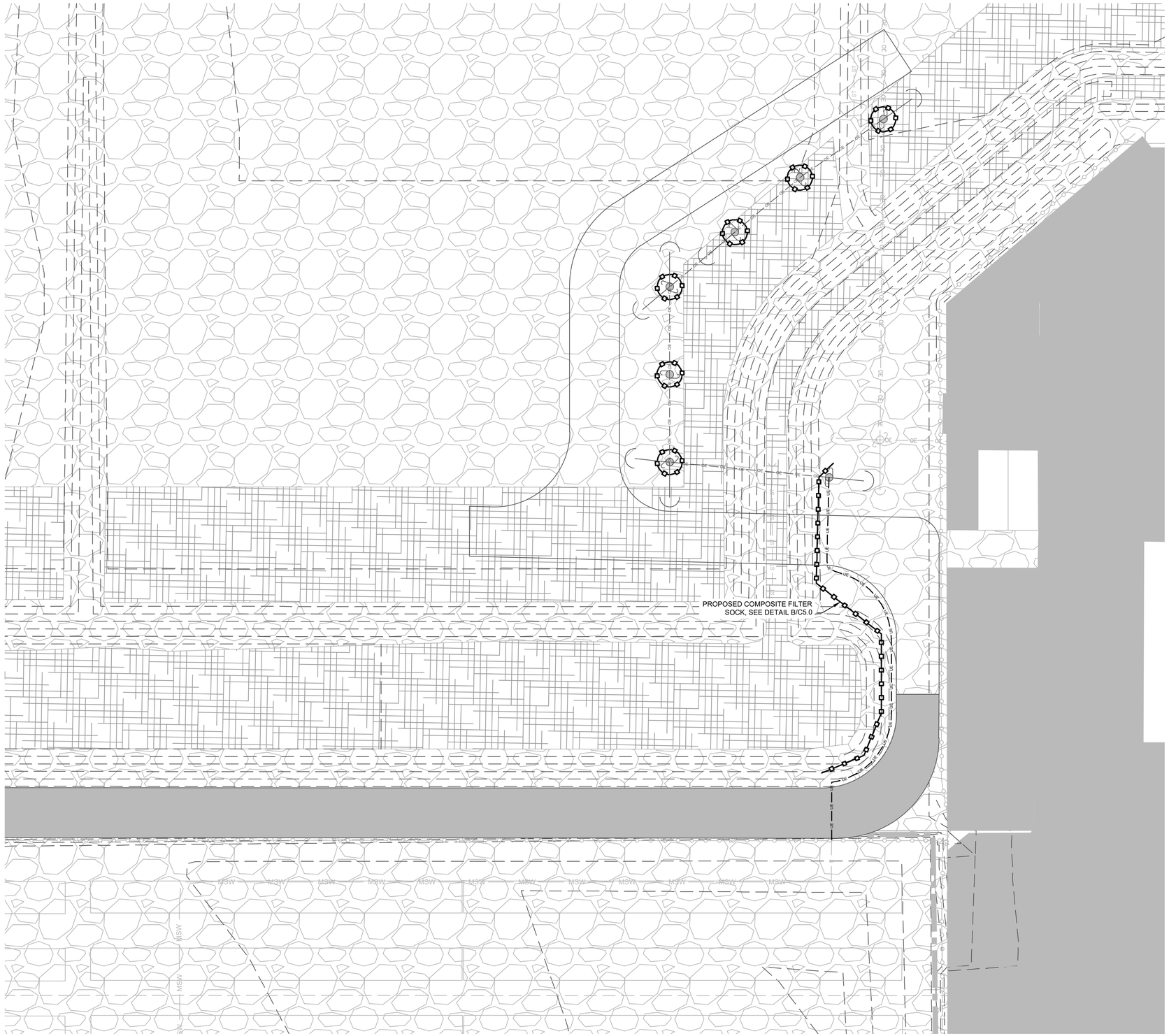
DRAWING: C-1.10



TEMPORARY EROSION & SEDIMENT CONTROL PLAN
SCALE: 1"= 20'

GRAPHIC SCALE
60 0 30 60 120 240
(IN FEET)
1 inch = 60 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

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LEGEND

- 586.5 — EXISTING CONTOUR .5' INTERVAL
- 585 — EXISTING CONTOUR 5' INTERVAL
- PROPOSED COMPOSITE FILTER SOCK
- UE — UE — UE — PROPOSED UNDERGROUND ELECTRIC
- EXISTING STORMWATER BASIN

NOTES:
1. SEE DETAIL A/C-5.0 FOR CONCRETE WASHOUT SPECIFICATIONS.
2. CONCRETE WASHOUT TO BE LOCATED ON ADJACENT PROPERTY LOCATED AT "45 ORLANDO STREET, BUFFALO, NY."
3. EXACT LOCATION OF CONCRETE WASHOUT ON ORLANDO STREET PROPERTY TO BE COORDINATED WITH LANDOWNER PRIOR TO CONSTRUCTION.

REV #	DESCRIPTION	DATE	BY
1	NOTES UPDATE	3/22/24	ESA

ELK STREET
SOLAR DEVELOPMENT PROJECT
CITY OF BUFFALO — ERIE COUNTY, NY

TEMPORARY EROSION &
SEDIMENT CONTROL PLAN

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

STATE OF NEW YORK · JENNIFER SUZANNE CROUNSE · LICENSED PROFESSIONAL ENGINEER · 120556
3/22/2024

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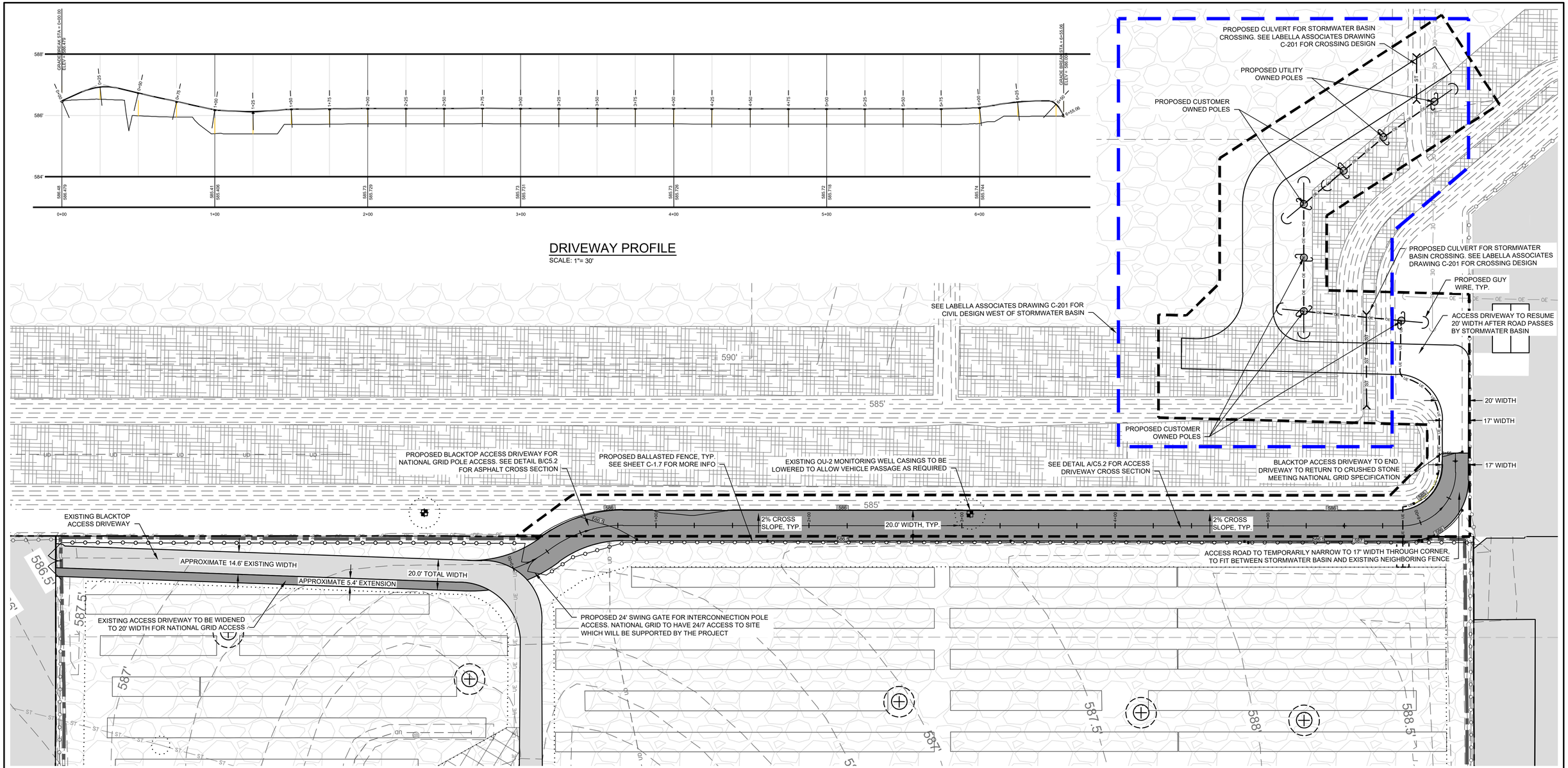
SCALE	AS SHOWN	DESIGNED BY: TSB, JAT	
		CHECKED BY: TSB, JSC	
		APPROVED BY: JSC	
C&A JOB#	5566.03	DRAWING:	C-1.11

DRIVEWAY PROFILE

SCALE: 1"= 30'



DRIVEWAY DESIGN

SCALE: 1"= 30'

LEGEND

- EXISTING CONTOUR .5' INTERVAL (586.5)
- EXISTING CONTOUR 5' INTERVAL (585)
- EXISTING LEASE LINE
- EXISTING/PROPOSED ROAD EDGE
- EXISTING/PROPOSED FENCE
- EXISTING STORMWATER LINE (ST)
- EXISTING/PROPOSED OVERHEAD ELECTRIC (OE)
- EXISTING UNDERGROUND ELECTRIC (UE)
- PROPOSED UNDERGROUND ELECTRIC (UE)
- EXISTING/PROPOSED EXTRACTION WELL PIPE (EWP)
- EXISTING UNDERDRAIN (UD)
- EXTENT OF GSL LINER/EXISTING UNDERDRAIN
- PROPOSED CULVERT FOR STORMWATER CROSSING
- PROPOSED NATIONAL GRID ACCESS AREA
- PROPOSED LABELLA CIVIL DESIGN BOUNDARY
- APPROXIMATE EXISTING UTILITY EASEMENT
- EXISTING PAVEMENT HATCH
- PROPOSED PAVEMENT HATCH
- EXISTING MONITORING WELL
- EXISTING GAS VENT W/ 5' AND 10' OFFSET
- EXISTING STORMWATER BASIN
- EXISTING CRUSHED STONE CAP MATERIAL

DRAWING NOTES:

1. BACKGROUND DRAWING INCLUDING PROPERTY BOUNDARIES, EXISTING SITE FEATURES, TOPOGRAPHY AND FEMA 1% ANNUAL CHANCE FLOOD ZONE FROM REMEDIATION DESIGN CAD FILES BY AMEC E&E P.C., DATED DECEMBER 2019, PROVIDED BY BQ ENERGY ON FEBRUARY 8, 2021.
2. EXISTING MONITORING WELL LOCATIONS TAKEN FROM GPS COORDINATES PROVIDED BY LABELLA ASSOCIATES, P.C. THROUGH BQ ENERGY ON JANUARY 12, 2022, AND APPROXIMATED FROM PDF TITLED "GROUNDWATER CONTOURS FIGURE 4" BY LABELLA ASSOCIATES, P.C. DATED MAY 2021.
3. PV MODULE LOCATIONS ARE APPROXIMATE. REFER TO RACKING MANUFACTURER DRAWINGS FOR EXACT DIMENSIONS.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

1 inch = 30 ft.

NAD83 NY-WEST

TRUE NORTH TO BE V.I.F

STATE OF NEW YORK — JAMES SUZANNE CONROD — LICENSED PROFESSIONAL ENGINEER — 120556

5/9/2024

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REV #	DESCRIPTION	DATE	BY

ELK STREET SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

DRIVEWAY DESIGN

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

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www.crawfordandassociates.com fax: (518) 828-2723

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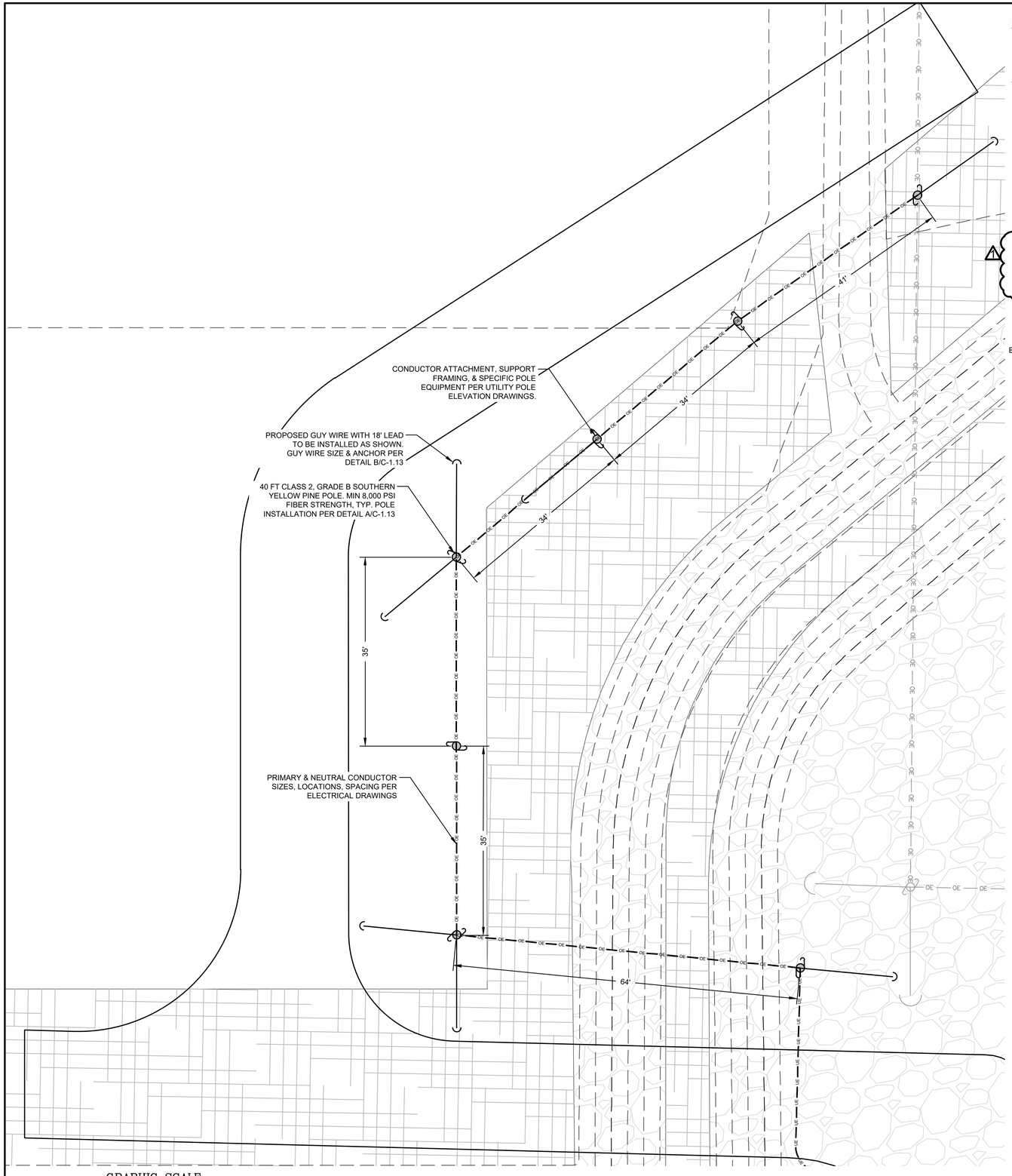
9/5/2023	DESIGNED BY: TSB, JAT	
SCALE	CHECKED BY: TSB, JSC	C&A JOB#
AS SHOWN	APPROVED BY: JSC	5566.03

DRAWING: C-1.12

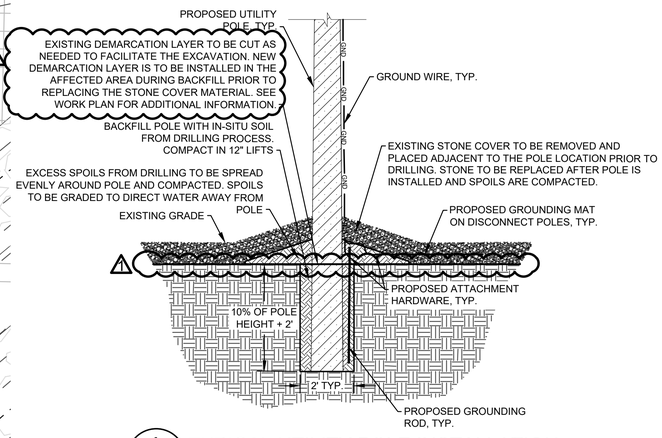


POLE SPECIFICATIONS

SCALE: 1"= 10'

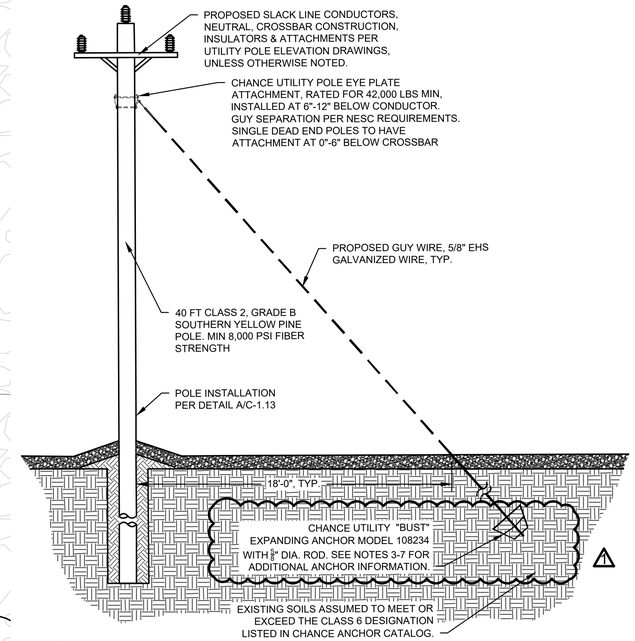
LEGEND

- 586.5 — EXISTING CONTOUR .5' INTERVAL
- 585 — EXISTING CONTOUR 5' INTERVAL
- OE — OE — EXISTING/PROPOSED OVERHEAD ELECTRIC
- UE — UE — UE — PROPOSED SHALLOW TRENCHING
- EXISTING/PROPOSED UTILITY POLE
- EXISTING/PROPOSED GUY WIRE
- EXISTING CRUSHED STONE CAP MATERIAL
- EXISTING STORMWATER BASIN



A / C1.13 TYPICAL UTILITY POLE INSTALLATION

N.T.S.



B / C1.13 TYPICAL GUY WIRE INSTALLATION

N.T.S.

GUY WIRE INSTALLATION NOTES:

1. ALL CUSTOMER OWNED POLES/GUYS SHOWN ON UTILITY POLE LAYOUT PLAN TO BE INSTALLED PER THIS DETAIL.
2. NATIONAL GRID OWNED POLES TO BE DESIGNED BY OTHERS.
3. ANCHOR TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
4. ANCHOR TO BE INSTALLED TO A MINIMUM VERTICAL DEPTH OF 6'.
5. INSTALLATION OF ANCHOR NOT TO EXCEED 5° OF ALIGNMENT.
6. ANCHOR TO BE INSTALLED IN RELATIVELY DRY AND SOLID SOILS. IF GROUND WATER OR SATURATED SOILS ARE ENCOUNTERED THE ENGINEER MUST BE NOTIFIED AND ANCHOR SELECTION MAY NEED TO BE REVISED ACCORDINGLY.
7. BACKFILL TO BE EXCEPTIONALLY AND THOROUGHLY COMPACTED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.

DRAWING NOTES:

1. BACKGROUND DRAWING INCLUDING PROPERTY BOUNDARIES, EXISTING SITE FEATURES, TOPOGRAPHY AND FEMA 1% ANNUAL CHANCE FLOOD ZONE FROM REMEDIATION DESIGN CAD FILES BY AMEC E&E P.C., DATED DECEMBER 2019, PROVIDED BY BQ ENERGY ON FEBRUARY 8, 2021.
2. EXISTING MONITORING WELL LOCATIONS TAKEN FROM GPS COORDINATES PROVIDED BY LABELLA ASSOCIATES, P.C. THROUGH BQ ENERGY ON JANUARY 12, 2022, AND APPROXIMATED FROM PDF TITLED "GROUNDWATER CONTOURS FIGURE 4" BY LABELLA ASSOCIATES, P.C. DATED MAY 2021.
3. CAB DESIGN AND LOCATION OF PV MODULES TAKEN FROM A REVISED TERRASMART DESIGN PROVIDED TO C&A IN CAD FORMAT ON 03/13/2024. CAB DESIGN LOCATION AND PV ARRAY DIMENSIONS ARE FOR REFERENCE ONLY AND ARE BASED ON THESE CAD FILES. REFER TO TERRASMART DESIGN DRAWINGS FOR EXACT DIMENSIONS.
4. 10 FOOT OFFSET FROM GAS VENTS FOR COMBINER BOXES, INVERTERS AND JUNCTIONS OTHER THAN PV SOURCE STRINGS. 5 FOOT OFFSETS FROM GAS VENTS FOR MODULES.
5. UTILITY EQUIPMENT IS FOR INFORMATION PURPOSES ONLY, NOT FOR CONSTRUCTION, AND MAY BE CHANGED BY THE UTILITY AT ANY TIME IN THE FUTURE.

Crossarm Specification Table

Material	Length, ft	Type	Dimensions, in.	Species or Model Number
Wood	8	Double	3.75 x 4.75	DF

Sag Chart: Waxwing-266.8 ACSR Conductor- Slack

Span, ft	Temperature	Sag	Horizontal Tension
35-45	0 °F	1' 5"	32 lbf
	10 °F	1' 5"	32 lbf
	20 °F	1' 6"	32 lbf
	30 °F	1' 6"	31 lbf
	40 °F	1' 6"	31 lbf
	50 °F	1' 6"	31 lbf
	60 °F	1' 6"	31 lbf
	70 °F	1' 6"	30 lbf
	80 °F	1' 7"	30 lbf
	90 °F	1' 7"	30 lbf
60-70	0 °F	1' 2"	142 lbf
	10 °F	1' 3"	134 lbf
	20 °F	1' 4"	128 lbf
	30 °F	1' 4"	122 lbf
	40 °F	1' 5"	117 lbf
	50 °F	1' 6"	113 lbf
	60 °F	1' 6"	109 lbf
	70 °F	1' 7"	105 lbf
	80 °F	1' 8"	102 lbf
	90 °F	1' 8"	99 lbf

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

STATE OF NEW YORK · ANDREW PAUL AUSTIN · 084164 · LICENSED PROFESSIONAL ENGINEER
3/22/2024

REV #	DESCRIPTION	DATE	BY
1	UPDATES PER NATIONAL GRID/DEC COMMENTS	3/22/24	ESA

ELK STREET SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

POLE SPECIFICATIONS & INSTALLATION DETAILS

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

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9/5/2023	DESIGNED BY: AJB	
SCALE	CHECKED BY: AJB	C&A JOB#
AS SHOWN	APPROVED BY: APA	5566.03

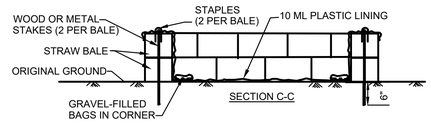
DRAWING: C–1.13

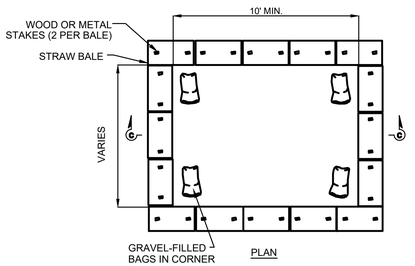
EROSION & SEDIMENT CONTROL GENERAL NOTES:

1. ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST VERSION OF THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL. (REFERRED TO IN REMAINING TEXT AS "THE NEW YORK GUIDELINES".)
2. THE SEDIMENT MEASURES DETAILED ON THE EROSION AND SEDIMENT CONTROL PLAN SHALL BE IN PLACE PRIOR TO CONSTRUCTION STARTUP. ONCE MEASURES ARE IN PLACE, ALL MEASURES SHALL BE PROPERLY MAINTAINED AND/OR REPLACED AS NECESSARY, AND THEN REMOVED FROM THE SITE BY THE CONTRACTOR ONCE SITE IS STABILIZED.
3. THE EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED BY THE CONTRACTOR UNTIL THE FINAL SURFACE TREATMENTS ARE INSTALLED AND THE VEGETATED AREAS HAVE BEEN STABILIZED WITH AT LEAST 80% VEGETATIVE COVER. THE PROPERTY OWNER WILL ASSUME RESPONSIBILITY FOR MAINTAINING THE EROSION AND SEDIMENT SYSTEM(S) THEREAFTER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES ONCE THE CONSTRUCTION PHASE HAS BEEN STABILIZED AND FUNCTIONING PROPERLY AS ACCEPTED BY THE ENGINEER.
5. THE CITY OF BUFFALO, NYSDEC, NYSDEP, OR THE SITE ENGINEER MAY REQUEST ADDITIONAL MEASURES TO MINIMIZE THE POTENTIAL FOR ONSITE OR OFFSITE EROSION PROBLEMS THAT MAY OCCUR DURING CONSTRUCTION.
6. COPIES OF THE SOIL EROSION AND SEDIMENT CONTROL PLANS MUST BE MAINTAINED ON SITE UNTIL NOTICE OF TERMINATION HAS BEEN FILED.

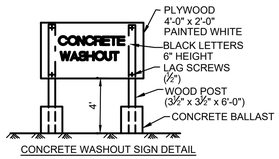
MAINTENANCE PLAN:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OPERATION AND MAINTENANCE OF THE NEW DEVELOPMENT PROJECT AND PROJECT ACCESS DURING CONSTRUCTION.
2. NO EARTHWORK ACTIVITIES SHALL COMMENCE UNTIL SILT SOCKS HAVE BEEN INSTALLED AS SHOWN ON DRAWINGS.
3. AREAS TO BE LEFT EXPOSED TO EROSION FOR MORE THAN 14 DAYS SHALL BE TEMPORARILY STABILIZED PER THE NEW YORK GUIDELINES.
4. PAVED AREAS SHALL BE KEPT FREE OF SEDIMENT, AND SHALL BE CLEANED PERIODICALLY AS REQUIRED BY CONSTRUCTION ACTIVITIES.
5. THE CONTRACTOR IS RESPONSIBLE TO INSPECT AND REPAIR EROSION AND SEDIMENT CONTROL MEASURES AS REQUIRED TO PREVENT DAMAGE OR SEDIMENTATION.
6. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, REMOVE AND DISPOSE OF TEMPORARY EROSION CONTROL MEASURES. CLEAN SEDIMENT AND DEBRIS FROM TEMPORARY MEASURES AND FROM PERMANENT STORM DRAIN AND SANITARY SEWER SYSTEMS.





STAPLE DETAIL



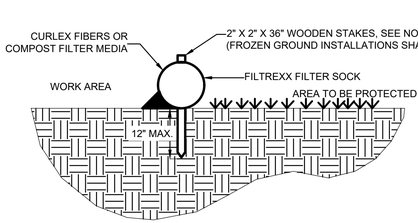
CONCRETE WASHOUT SIGN DETAIL

NOTES:

1. TEMPORARY CONCRETE WASHOUT FACILITIES FOR THIS PROJECT SHALL BE LOCATED ON A NEIGHBORING PARCEL, OWNED BY THE SAME LANDOWNER. ADDRESS OF NEIGHBORING PARCEL IS "45 ORLANDO STREET, BUFFALO, NEW YORK. EXACT LOCATION ON ORLANDO STREET PARCEL TO BE COORDINATED WITH LANDOWNER PRIOR TO CONSTRUCTION.
2. TEMPORARY CONCRETE WASHOUT FACILITIES SHOULD BE LOCATED A MINIMUM OF 100 FEET FROM STORM DRAIN INLETS, OPEN DRAINAGE FACILITIES, AND WATER COURSES. EACH FACILITY SHOULD BE LOCATED AWAY FROM CONSTRUCTION TRAFFIC OR ACCESS AREAS TO PREVENT DISTURBANCE OR TRACKING.
3. A SIGN SHOULD BE INSTALLED ADJACENT TO EACH WASHOUT FACILITY TO INFORM CONCRETE EQUIPMENT OPERATORS TO UTILIZE THE PROPER FACILITIES.
4. TEMPORARY CONCRETE WASHOUT FACILITIES SHOULD BE CONSTRUCTED ABOVE GRADE. TEMPORARY CONCRETE WASHOUT FACILITIES SHOULD BE CONSTRUCTED AND MAINTAINED IN SUFFICIENT QUANTITY AND SIZE TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS.
5. TEMPORARY WASHOUT FACILITIES SHOULD HAVE A TEMPORARY BERMED AREA OF SUFFICIENT VOLUME TO COMPLETELY CONTAIN ALL LIQUID AND WASTE CONCRETE MATERIALS GENERATED DURING WASHOUT PROCEDURES.
6. WASHOUT OF CONCRETE TRUCKS SHOULD BE PERFORMED IN DESIGNATED AREAS ONLY.
7. ONLY CONCRETE FROM MIXER TRUCK CHUTES SHOULD BE WASHED INTO CONCRETE WASH OUT.
8. ONCE CONCRETE WASTES ARE WASHED INTO THE DESIGNATED AREA AND ALLOWED TO HARDEN, THE CONCRETE SHOULD BE BROKEN UP, REMOVED, AND DISPOSED OF PER SOLID WASTE MANAGEMENT STANDARDS. DISPOSE OF HARDENED CONCRETE ON A REGULAR BASIS.
9. TEMPORARY ABOVE GRADE WASHOUT FACILITIES SHOULD BE CONSTRUCTED AS SHOWN IN THIS DETAIL.

A C5.0 CONCRETE WASHOUT DETAIL

SCALE: N.T.S.



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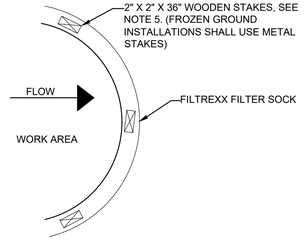

PLAN

INSTALLATION NOTES:

1. COMPOSITE FILTER SOCKS SHALL BE FILTREXX(R) SILT SOXX (TM) OR APPROVED EQUAL.
2. LAND SURFACE SHOULD BE PREPARED BY MOWING GRASS OR MAKING SOIL OR PAVED SURFACES SMOOTH.
3. COMPOSITE FILTER SOCKS SHALL BE PLACED PERPENDICULAR TO STORM WATER FLOW, ACROSS THE SLOPE, SWALE, DITCH OR CHANNEL.
4. COMPOSITE FILTER SOCKS SHALL BE PLACED ON CONTOURS.
5. ON SOIL AND VEGETATED SURFACES, UNDER SHEET FLOW CONDITIONS, COMPOSITE FILTER SOCKS SHALL BE STAKED ON 10-FT CENTERS. UNDER CONCENTRATED FLOW CONDITIONS COMPOSITE FILTER SOCKS SHALL BE STAKED ON 5-FT CENTERS.
6. STAKES SHALL BE DRIVEN THROUGH THE CENTER OF THE COMPOSITE FILTER SOCK AND INSTALLED A MINIMUM OF 8 INCHES AND A MAXIMUM OF 12 INCHES INTO THE EXISTING SOIL, LEAVING A MINIMUM STAKE HEIGHT OF 2 INCHES ABOVE THE COMPOSITE FILTER SOCK.
7. EDGES OF THE COMPOSITE FILTER SOCKS SHALL BE TURNED UPSLOPE TO PREVENT SLOW AROUND THE ENDS OF THE COMPOSITE FILTER SOCKS.

REMOVAL NOTES:

1. UPON REMOVAL OF THE COMPOSITE FILTER SOCK, THE CONTRACTOR SHALL REMOVE ALL SEDIMENT ACCUMULATION PRIOR TO THE REMOVAL OF THE COMPOSITE FILTER SOCK. THE COMPOSITE FILTER SOCKS SHALL BE REMOVED IN THEIR ENTIRETY.
2. THE DISTURBED AREA SHALL BE SEEDED, FERTILIZED, AND MULCHED TO ENSURE THE VEGETATIVE COVER IS FULLY RESTORED.
3. MONITOR THE VEGETATIVE RESTORATION AREA UNTIL EXPOSED AREAS ARE FULLY STABILIZED WITH VEGETATIVE COVER.
4. THE COMPOSITE MATERIAL MAY BE SPREAD OVER THE LANDSCAPE OR INCORPORATED INTO THE SOIL AT THE END OF THE PROJECT, THEREBY INCREASING SOIL QUALITY AND REDUCING WASTE.
5. THE SOCK MESH SHALL BE PROPERLY DISPOSED.

B C5.0 FILTER SOCK DETAIL

SCALE: N.T.S.

REV #	DESCRIPTION	DATE	BY

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

EROSION & SEDIMENT CONTROL DETAILS

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STATE OF NEW YORK · JENNIFER SUZANNE CRAWFORD · 130556 · LICENSED PROFESSIONAL ENGINEER

9/5/2024

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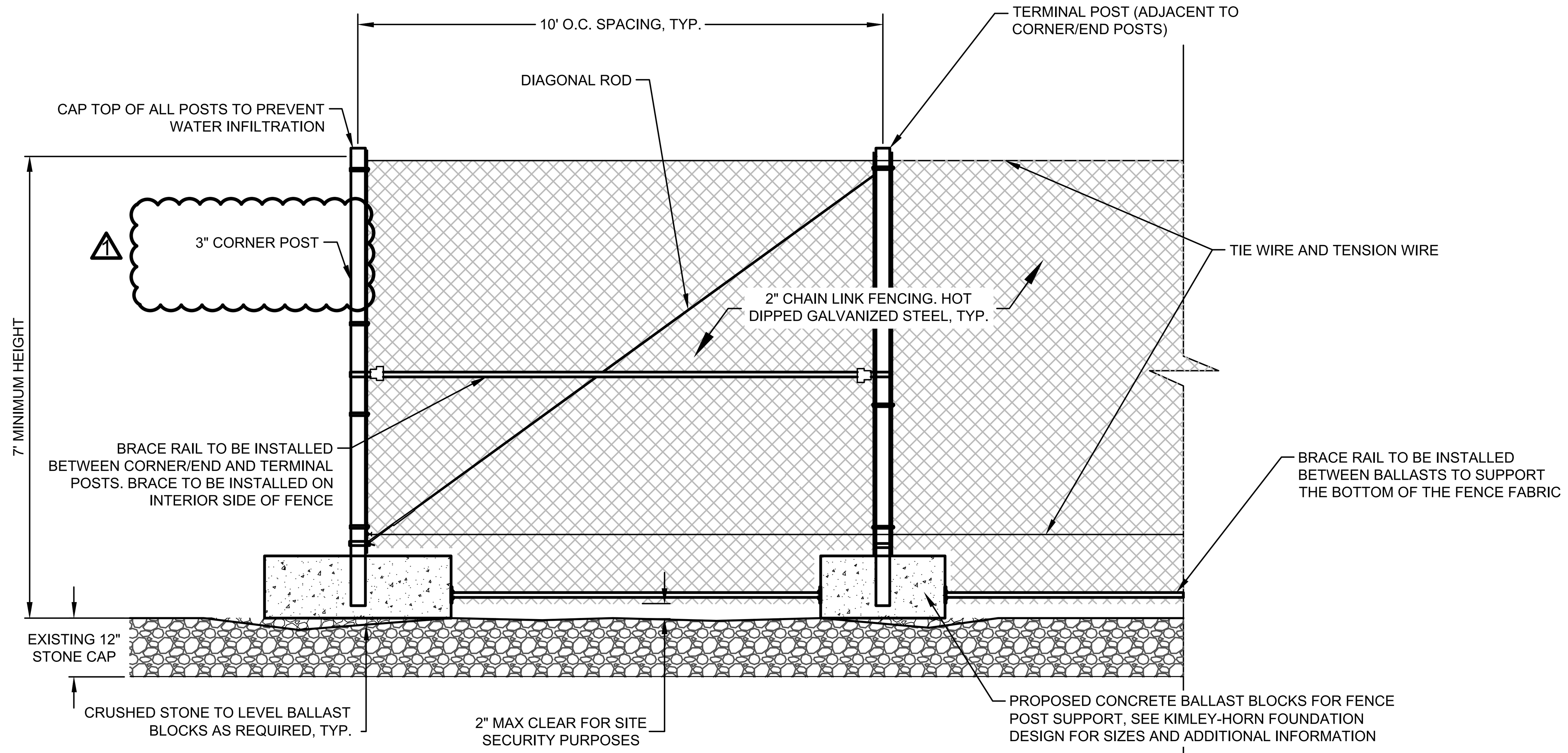
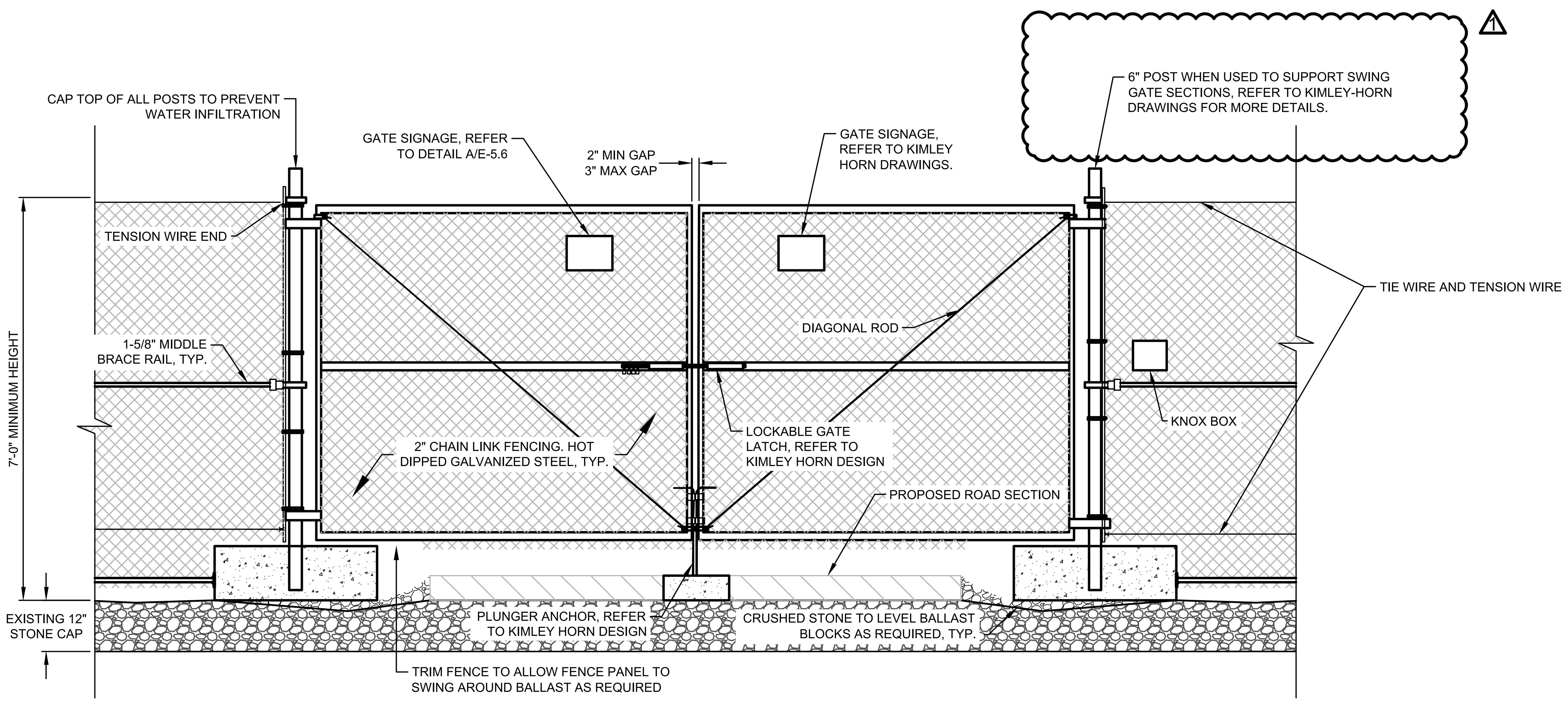
9/5/2023	DESIGNED BY: TSB	
SCALE	CHECKED BY: JSC	C&A JOB#: 5566.03
AS SHOWN	APPROVED BY: JSC	DRAWING: C-5.0



NOTES:
1. BALLASTED FENCE/GATES SHALL BE UTILIZED WHEREVER FENCE IS LOCATED ON THE IMPERMEABLE CAP.
2. CORNER POSTS SHOULD BE DIAGONALLY BRACED FOR GREATER STABILITY.
3. POST SPACING SHOULD BE EQUIDISTANT AND SHOULD NOT EXCEED 10'-0" O.C.
4. FENCING POSTS, RAILS, AND MESH TO BE HOT DIPPED GALVANIZED STEEL.
5. FENCE SHOULD BE A MINIMUM OF 7'-0" HIGH AT ALL LOCATIONS.
6. FENCE TO BE BONDED TO ABOVE GRADE CONDUIT ALL ALL FENCE-CONDUIT CROSSING LOCATIONS
7. REFER TO KIMLEY-HORN DRAWINGS FOR BALLAST DESIGN AND DIMENSIONS.
8. ALL FENCING IS TO BE INSTALLED PER MANUFACTURER'S DESIGN, RECOMMENDATION AND SPECIFICATIONS.

A / C5.1 NO EXCAVATION BALLASTED FENCE DETAIL

SCALE: N.T.S.



NOTES:
1. BALLASTED FENCE/GATES SHALL BE UTILIZED WHEREVER FENCE IS LOCATED ON THE IMPERMEABLE CAP.
2. FENCING POSTS, RAILS, AND MESH TO BE HOT DIPPED GALVANIZED STEEL.
3. FENCE SHOULD BE A MINIMUM OF 7'-0" HIGH AT ALL LOCATIONS.
4. REFER TO KIMLEY-HORN DRAWINGS FOR BALLAST DESIGN AND DIMENSIONS.
5. ALL FENCING IS TO BE INSTALLED PER MANUFACTURER'S DESIGN, RECOMMENDATION AND SPECIFICATIONS.

B / C5.1 BALLASTED DOUBLE SWING GATE DETAIL

SCALE: N.T.S.

REV #	DESCRIPTION	DATE	BY
1	UPDATES TO POST SIZING	3/22/24	ESA

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

FENCE DETAILS

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

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4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700 fax: (518) 828-2723
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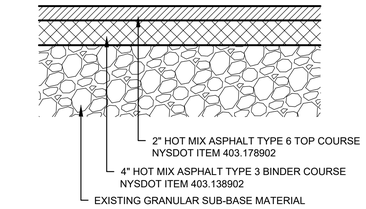
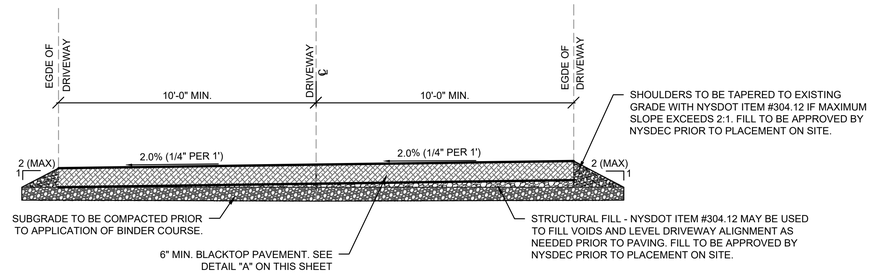
DATE	DRAWN BY: TSB/ESA	H:\WORK\5566.02 Elk Street\DWG\5566.02 DETAILS.dwg	
10/4/2023	DESIGNED BY: TSB	C&A JOB#	DRAWING:
SCALE	CHECKED BY: JSC	5566.03	C-5.1
AS SHOWN	APPROVED BY: JSC		



A / C5.2 TYPICAL BLACKTOP ROADWAY CONSTRUCTION DETAIL

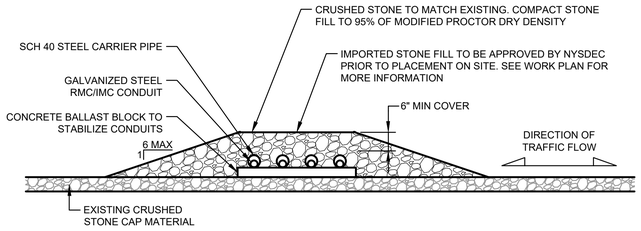
N.T.S.



NOTES:
1. ACCESS DRIVE SHALL BE BUILT ON EXISTING CRUSHED STONE CAP. CAP TO BE COMPACTED PRIOR TO APPLICATION OF BINDER COURSE. COMPACTOR PRESSURE TO BE LESS THAN 10PSI ON CAPPED AREAS.
2. THE ACCESS DRIVE SHALL BE A MINIMUM OF 6 INCHES IN DEPTH OF BLACKTOP PAVEMENT. SEE DETAIL "A" ON THIS SHEET FOR PAVEMENT CROSS SECTION.
3. ACCESS DRIVEWAY TO HAVE A TYPICAL CROSS SLOPE OF 2% TOWARDS THE EXISTING STORMWATER TREATMENT AREA, LOCATED TO THE NORTH SIDE OF THE DRIVEWAY.

B / C5.2 ACCESS DRIVE DETAIL

SCALE: N.T.S.



C / C5.2 BERMED CONDUIT CROSSING

SCALE: N.T.S.

REV #	DESCRIPTION	DATE	BY

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

DRIVEWAY DETAILS & ELEVATIONS

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

LICENSED PROFESSIONAL ENGINEER — JENNIFER SUZANNE CRAWFORD — 100556 — STATE OF NEW YORK

9/5/2024

DATE	9/5/2023	DRAWN BY:	TSB
		DESIGNED BY:	TSB
SCALE	AS SHOWN	CHECKED BY:	JSC
		APPROVED BY:	JSC

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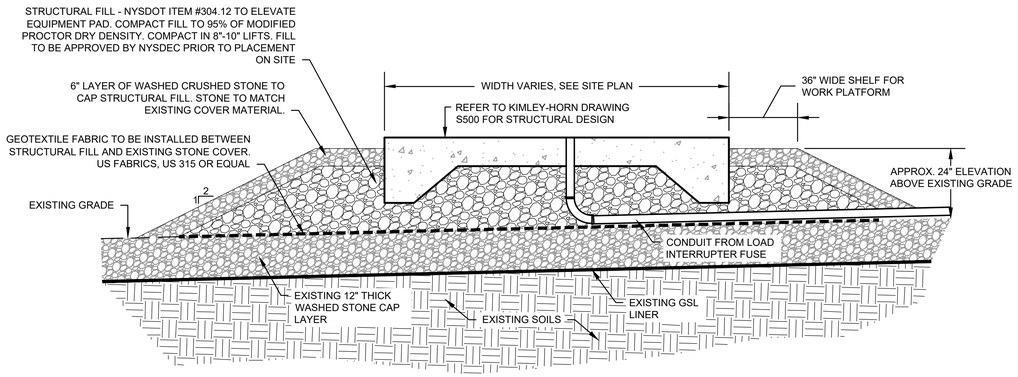
C&A JOB#: 5566.03

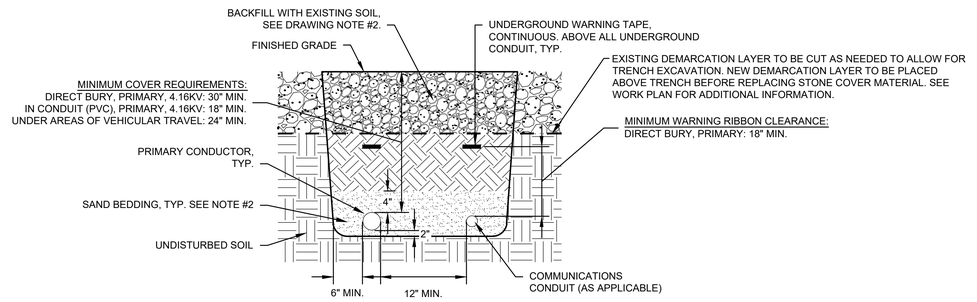
DRAWING: C-5.2



A C5.3 CONCRETE PAD DETAIL

SCALE: N.T.S.

NOTES:
1. EXCAVATION IS NOT TO BE PERFORMED IN THE EXISTING CAP MATERIAL UNLESS SPECIFICALLY NOTED IN THIS DRAWING SET.
2. GEOTEXTILE FABRIC TO BE INSTALLED BETWEEN STRUCTURAL FILL AND EXISTING STONE COVER TO PREVENT TRANSPORT OF FINES FROM FILL INTO EXISTING COVER STONE.
3. REFER TO KIMLEY HORN DRAWING S500 FOR STRUCTURAL DESIGN DETAILS



B C5.3 CONDUIT TRENCH DETAIL OFF EXTENT OF GSL LINER

SCALE: N.T.S.

TRENCHING NOTES:
1. VEHICLE ACTIVITY AND SURFACE LOADING OVER THE BURIED CONDUIT OR CONDUCTORS SHALL NOT EXCEED THEIR RATED CRUSH TEST CAPACITY.
2. BACKFILL MATERIAL SHALL BE SPOILS FROM EXCAVATION, COMPACTED. NATIVE BACKFILL MATERIAL ONLY ACCEPTABLE IF IT CAN PASS THROUGH A 3" SCREEN. SAND BEDDING SHALL BE USED AROUND CONDUCTORS FOR PADDING, TYP.
3. THE NUMBER OF CONDUITS/CIRCUITS SHOWN IS REPRESENTATIVE AND WILL VARY PER THE PLANS AND SCHEDULES.
4. 12" MIN. CLEARANCE SHALL BE MAINTAINED BETWEEN POWER AND DATA WIRING.
5. EDGE OF TRENCH SHALL BE A MIN. OF 3' CLEAR FROM THE EDGE OF EQUIPMENT PAD UNLESS APPROVED BY E.O.R.
6. ALL CONDUIT INSTALLATION TO CONFORM TO NEC TABLE 300.5.

REV #	DESCRIPTION	DATE	BY

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

MISCELLANEOUS CIVIL DETAILS

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
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STATE OF NEW YORK — JENNIFER SUZANNE CROWLEY — 120556 — LICENSED PROFESSIONAL ENGINEER

9/5/2024

DATE	DRAWN BY:	TSB	N:\WORK\5566.02 Elk Street\DWG\5566.02 DETAILS.dwg
9/5/2023	DESIGNED BY:	TSB	
SCALE	CHECKED BY:	JSC	C&A JOB#: 5566.03
AS SHOWN	APPROVED BY:	JSC	DRAWING: C-5.3

DIVISION OF DESIGN RESPONSIBILITY

ENGINEER OF RECORD	SCOPE OF WORK
CRAWFORD & ASSOCIATES ENGINEERING & LAND SURVEYING, P.C. 4411 ROUTE 9, SUITE 200 HUDSON, NY 12534 (518) 828-2700	- ELECTRICAL ENGINEER OF RECORD - CIVIL ENGINEER OF RECORD
LABELLA ASSOCIATES, P.C. 300 PEARL STREET, SUITE 130 BUFFALO, NY 14202 (761) 551-6281	- ENVIRONMENTAL PERMITTING ENGINEER - STORMWATER BASIN CROSSING DESIGN ENGINEER OF RECORD
KIMLEY-HORN AND ASSOCIATES, INC. 1 NORTH LEXINGTON AVENUE, SUITE 505 WHITE PLAINS, NY 10601 (216) 273-8327	- BALLSTED FENCE DESIGN ENGINEER OF RECORD - EQUIPMENT PAD DESIGN ENGINEER OF RECORD
TERRASMART, LLC. 6715 STEGER DRIVE CINCINNATI, OH 45237 (513) 242-2051	- STRUCTURAL RACKING ENGINEER OF RECORD - MESSENGER SUPPORTED WIRING DESIGN ENGINEER OF RECORD

IT IS ASSUMED THAT THE FOLLOWING FALL OUTSIDE OF THE SCOPE OF C&A AND ARE TO BE COMPLETED BY OTHERS:
- RACKING DESIGN & STRUCTURAL CALCULATIONS IN ACCORDANCE WITH THE RESPECTIVE PCUP DOCUMENT
- FENCING DESIGN & STRUCTURAL CALCULATIONS IN ACCORDANCE WITH THE RESPECTIVE PCUP DOCUMENT
- GEOTECHNICAL TESTING (TO BE SENT TO C&A BY OTHERS FOR INCORPORATION INTO CIVIL DESIGN)
- CAB MESSENGER WIRING DESIGN (PROVIDED BY OTHERS FOR INCORPORATION INTO ELECTRICAL DESIGN)
- SPECIFICATIONS FOR ALL OTHER MAJOR COMPONENTS INCLUDING BUT NOT LIMITED TO MODULES, INVERTERS, COMMUNICATION/MONITIORING SYSTEMS.

DISTURBANCE TABLE:

Site Feature:	Area per item (SF):	QTY:	Area Total (SF):	Area (Acre):	Disturbance:	existing impervious surface:[2]	Installed over Existing Pervious Surface:
IX Equipment Pad	187	1	187	0.00	Y	Y	N
Utility Poles	1	7	7	0.00	Y	N	Y
Solar Ballasts[1]	36	776	27645	0.63	N	Y	N
Fence Ballasts	5.1	164	836	0.02	Y	Y	N
Trenching	2	187	374	0.01	Y	N	Y
Proposed Driveway	24,700	1	24700	0.57	Y	N	Y
				TOTAL (AC):	0.60	0.66	0.58
						Total Impervious Added (AC):	0.58

[1] BALLAST QUANITY AND GROUND CONTACT AREA FROM TERRASMART RACKING DRAWING RECEIVED ON 7/26/2023.
[2] EXISTING SITE IS ASSUMED TO BE IMPERVIOUS DUE TO IMPERVIOUS GSL LINER AND DRAINAGE SYSTEM BELOW STONE CAP LAYER. ADDING IMPERVIOUS SURFACE ABOVE THE GSL LINER WILL NOT AFFECT INFILTRATION OF STORMWATER

REV #	DESCRIPTION	DATE	BY

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

CIVIL CALCULATIONS

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

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ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

STATE OF NEW YORK — LICENSED PROFESSIONAL ENGINEER — JESSE SUZANNE CRAWFORD — 120556
9/5/2024

DATE	9/5/2023	DRAWN BY:	TSH
		DESIGNED BY:	TSH
SCALE	AS SHOWN	CHECKED BY:	JSC
		APPROVED BY:	JSC

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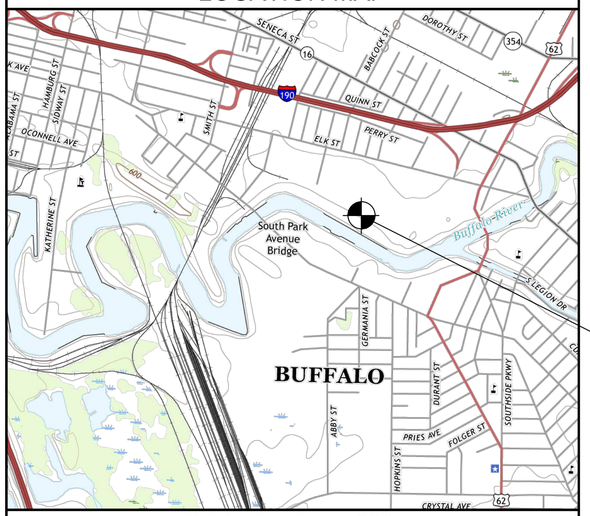
C&A JOB# 5566.03

DRAWING: C-5.4

LOCATION MAP



SITE LOCATION

SCALE: 1" = 1,500'

ELK STREET
SOLAR DEVELOPMENT PROJECT

SITE ADDRESS: 503 ELK STREET, BUFFALO, NY 14210
TAX ID#: 123.13-1-2.111

PREPARED FOR:

INOVATEUS SOLAR LLC

19890 STATE LINE ROAD
SOUTH BEND, IN 46637

ENGINEER:

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

C&A #: 5566.02
DATE: SEPTEMBER 5, 2023
REVISED: MARCH 22, 2024

STATE OF NEW YORK · JENNIFER SUZANNE CRAWFORD · LICENSED PROFESSIONAL ENGINEER · 100555
3/22/2024

DRAWINGS:

T-0.0	TITLE SHEET
T-0.1	CONSTRUCTION NOTES - SHEET 1
T-0.2	CONSTRUCTION NOTES - SHEET 2
T-0.3	CONSTRUCTION ACCESS & STAGING
E-1.0	EXISTING CONDITIONS SITE MAP
E-1.1	PROPOSED ELECTRICAL SITE PLAN
E-1.2	TRENCHING PLAN
E-1.3	INVERTER ZONES
E-1.4	GROUNDING PLAN
E-1.5	AC CABLE PLAN
E-1.6	DC CABLE PLAN
E-1.7	COMMUNICATIONS LAYOUT
E-1.8	ARRAY MAPPING PLAN
E-1.9	COMBINER BOX ZONES – AREA 1
E-1.10	COMBINER BOX ZONES – AREA 2
E-1.11	COMBINER BOX ZONES – AREA 3
E-1.12	COMBINER BOX ZONES – AREA 4
E-1.13	COMBINER BOX ZONES – AREA 5
E-1.14	INTERCONNECT PLAN
E-1.15	EQUIPMENT PAD LAYOUT
E-2.0	EQUIPMENT ELEVATIONS
E-2.1	UTILITY POLE ELEVATIONS - SHEET 1
E-2.2	UTILITY POLE ELEVATIONS - SHEET 2
E-2.3	UTILITY POLE ELEVATIONS - SHEET 3
E-2.4	UTILITY POLE ELEVATIONS - SHEET 4
E-2.5	UTILITY POLE ELEVATIONS - SHEET 5
E-2.6	UTILITY POLE ELEVATIONS - SHEET 6 ⚠1
E-2.7	UTILITY POLE ELEVATIONS - SHEET 7 ⚠2
E-5.0	GROUNDING DETAILS
E-5.1	GROUNDING RING DETAILS
E-5.2	WIRE MANAGEMENT DETAILS
E-5.3	MISCELLANEOUS ELECTRICAL DETAILS -SHEET 1
E-5.4	MISCELLANEOUS ELECTRICAL DETAILS -SHEET 2
E-5.5	SYSTEM SIGNAGE AND LABELING -SHEET 1
E-5.6	SYSTEM SIGNAGE AND LABELING -SHEET 2
E-5.7	SYSTEM SIGNAGE AND LABELING -SHEET 3
E-6.0	INTERCONNECTION SINGLE LINE DIAGRAM
E-6.1	SYSTEM THREE LINE DIAGRAM ⚠2
E-6.2	INVERTER WIRING DIAGRAM
E-6.3	GROUNDING DIAGRAM
E-6.4	AUXILIARY POWER DIAGRAM
E-6.5	DC CONDUCTOR SCHEDULE
E-6.6	AC CONDUCTOR SCHEDULE
E-6.7	AUXILIARY POWER SCHEDULE
E-6.8	AC CONTROL SCHEMATIC ⚠2
E-7.0	MODULE DATASHEET
E-7.1	INVERTER DATASHEET

STAKEHOLDERS:
EPC: INOVATEUS SOLAR, LLC
SURVEYOR: AMEC E&E P.C.
CIVIL & ELECTRICAL ENGINEER(S) OF RECORD: CRAWFORD & ASSOCIATES ENGINEERING & LAN
SURVEYING, P.C.
STRUCTURAL ENGINEER(S) OF RECORD: KIMLEY-HORN AND ASSOCIATES, INC., TERRASMART, L
PERMIT ENGINEER: LABELLA ASSOCIATES, P.C.
INTERCONNECTION DESIGN: JEM ENGINEERING SERVICES, LLC
SITE OWNER: ELK STREET COMMERCE PARK, LLC (ESCP)
POWER BUYER: COMMUNITY DISTRIBUTED GENERATION
UTILITY: NATIONAL GRID
PROJECT OWNER: ELK STREET SOLAR, LLC., A SUBSIDIARY OF BQ ENERGY

BROWNFIELD NOTES

1. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH THE CHANGE OF USE LETTER - WORK PLAN: 503, 623, 625, 635 ELK STREET, BUFFALO, NY (NYSDEC SITES #C915201D AND #C915201B) PREPARED BY LABELLA ASSOCIATES, P.C.
2. THE CONTRACTOR SHALL PREPARE AND SUBMIT TO INOVATEUS SOLAR A SITE-SPECIFIC HEALTH AND SAFETY PLAN AT LEAST TWO WEEKS PRIOR TO START OF CONSTRUCTION.
3. ACCESS TO EXISTING EXTRACTION WELLS MUST BE MAINTAINED ON SITE. NO STRUCTURES SHALL BE INSTALLED WITHIN A TEN (10) FOOT CLEARANCE FROM EXTRACTION WELLS.
4. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO ENSURE THAT THE PROPOSED CONSTRUCTION WORK ASSOCIATED WITH THE SOLAR PROJECT SHALL NOT IN ANY WAY DAMAGE THE IMPERMEABLE GSL LINER, EXTRACTION WELLS, EXTRACTION WELL PIPING, OR OTHER SITE FEATURES INSTALLED AS PART OF THE SITE REMEDIATION PROJECT. IF DAMAGE OCCURS TO ANY OF THE ABOVE-LISTED COMPONENTS, THE CONTRACTOR SHALL NOTIFY INOVATEUS SOLAR IMMEDIATELY. A WRITTEN PLAN FOR REPAIR OF THE COMPONENTS SHALL BE PREPARED AND APPROVED BY THE AUTHORITY HAVING JURISDICTION AND ANY REPAIR WORK SHALL BE PROMPTLY COMPLETED. ESCP RESERVES THE RIGHT TO REVIEW AND APPROVE ANY WRITTEN PLANS FOR REPAIR OF COMPONENTS. NOTE THAT ALL CORRESPONDENCE WITH NYSDEC SHALL BE THROUGH ESCP. NEITHER INOVATEUS SOLAR OR THE CONTRACTOR(S) SHALL COMMUNICATE DIRECTLY WITH NYSDEC WITHOUT ADVANCE WRITTEN AUTHORIZATION FROM ESCP.
5. MINIMIZE WORK AND VEHICLE TRAVEL IN 10' SET-BACK ZONES FROM EXTRACTION WELLS TO PREVENT ACCIDENTAL DAMAGE TO THESE STRUCTURES. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES, ALL MONITORING WELLS, AND OTHER EXISTING ABOVE-GROUND STRUCTURES OF THE PROJECT SITE SHALL BE FLAGGED FOR VISIBILITY AND PROTECTIVE BARRIERS SHALL BE PLACED AROUND SUCH STRUCTURES TO PREVENT DAMAGE BY VEHICLES ACCESSING THE CAP AREA.
6. CONTACT DIG-SAFE NEW YORK (1-800-962-7962) PRIOR TO EXCAVATING AS REQUIRED BY NYCRR. ALL OPERATORS PERFORMING DIGGING OPERATIONS SHALL BE CERTIFIED BY DSNY CERTIFIED EXCAVATOR PROGRAM AS REQUIRED BY LAW.
7. ANY PROPOSED EXCAVATION GREATER THAN 12" IN DEPTH WILL REQUIRE THE EXISTING DEMARCATION LAYER TO BE CUT AS NEEDED TO FACILITATE THE EXCAVATION. NEW DEMARCATION LAYER IS TO BE INSTALLED IN THE AFFECTED AREA DURING BACKFILL PRIOR TO REPLACING THE STONE COVER MATERIAL. SEE WORK PLAN FOR ADDITIONAL INFORMATION.
8. DO NOT USE STEEL PINS, GRADE STAKES, OR OTHER MARKING DEVICES THAT COULD PUNCTURE THE GSL LINER.
9. CAST THE FOUNDATION BLOCKS IN PLACE BY PUMPING CONCRETE OR WITH SPECIALIZED LOW GROUND PRESSURE EQUIPMENT (10 PSI MAXIMUM) TO CARRY CONCRETE TO THE BALLAST BLOCK LOCATION AS SPECIFIED BY THE RACKING MANUFACTURER. PRECAST FOOTINGS MAY BE USED AS LONG AS 10PSI GROUND PRESSURE LIMIT IS NOT VIOLATED.
10. IF WINTER WORK IS REQUIRED, THE CONTRACTOR SHALL SUBMIT A COLD-WEATHER CONCRETING PLAN SPECIFICALLY FOR THE INSTALLATION OF THE CONCRETE FOOTINGS. THE PLAN SHALL BE PREPARED IN GENERAL ACCORDANCE WITH ACI 306R GUIDE TO COLD WEATHER CONCRETING. OR OTHER EQUIVALENT INDUSTRIAL STANDARD. THE PLAN SHALL BE SUBMITTED TO INOVATEUS SOLAR AT LEAST TWO WEEKS PRIOR TO START OF CONSTRUCTION FOR APPROVAL.

PROCEDURAL NOTES:

1. PRIOR TO COMMENCEMENT OF ANY WORK, THE CONTRACTOR SHALL NOTIFY ENGINEER OF RECORDS OF ANY DISCREPANCIES NOTED TO EXISTING CONDITIONS, STRUCTURE, ELECTRICAL RUNS (SPECIFY EXISTING ITEMS), ETC. AMONG SITE CONDITIONS, MANUFACTURER RECOMMENDATIONS OR CODES, REGULATIONS OR RULES OF JURISDICTIONS HAVING AUTHORITY.
2. A PRE-CONSTRUCTION CONFERENCE IS TO BE HELD BETWEEN THE CONTRACTOR, DEVELOPER, ESCP, CITY OF BUFFALO BUILDING DEPARTMENT AND ANY OTHER INVOLVED PARTIES AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION.
3. ALL DIMENSIONS OF EXISTING CONDITIONS MUST BE VERIFIED PRIOR TO COMMENCING WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR ALL BRACING AND SHORING OF EQUIPMENT DURING INSTALLATION.
5. CONTRACTORS SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS, OSHA REQUIREMENTS AND SAFETY MEASURES ON SITE. THE EOR HAS NO OVERALL SUPERVISORY AUTHORITY AND NO DIRECT RESPONSIBILITY FOR THE SPECIFIC WORKING CONDITIONS OR FOR POSSIBLE EXISTING HAZARDS.
6. CONTRACTOR SHALL PAY FOR AND SECURE ALL PERMITS AND UNDERWRITERS CERTIFICATES.
7. ALL METERS, INSTRUMENTS, CABLE CONNECTION EQUIPMENT AND APPARATUS NECESSARY FOR PERFORMING ALL TESTS SHALL BE FURNISHED BY THE CONTRACTOR.
8. CONTRACTOR INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE ENGINEER OF RECORD AND ESCP FOR APPROVAL PRIOR TO MAKING THE CHANGES. ESCP RESERVES THE RIGHT TO REVIEW AND APPROVE ANY CONTRACTOR INITIATED CHANGES. APPROVED CHANGES SHALL REQUIRE A DRAWING REVISION TO MAINTAIN CONTROL OVER THE ENGINEER APPROVED DESIGN. DEVIATION FROM THESE PLANS PRIOR TO ENGINEERING APPROVAL PLACES ALL LIABILITY ON THE CONTRACTOR.
9. CONTRACTOR SHALL PROVIDE RED-LINED AS-BUILT DRAWINGS THAT INCLUDE ALL DEVIATIONS FROM THE DESIGN DRAWINGS.

GENERAL REQUIREMENTS:

1. ANY WASTE GENERATED AT THE SITE BY THIS WORK SHALL BE DISPOSED OF IN ACCORDANCE WITH THE SITE MANAGEMENT PLAN AND ANY APPLICABLE LOCAL, STATE OR FEDERAL LAWS. IN PARTICULAR, ANY WASTE SOIL GENERATED MUST BE CONTAINERIZED AND, IF REQUIRED, CATEGORIZED FOR OFFSITE DISPOSAL. MANIFESTS FOR SUCH DISPOSAL SHALL BE PROVIDED TO ESCP OR THEIR REPRESENTATIVE FOR INCLUSION IN THE ANNUAL PERIODIC REVIEW REPORT (PRR).
2. BULK STORAGE OF HAZARDOUS MATERIALS, INCLUDING BUT NOT LIMITED TO PETROLEUM PRODUCTS, SHALL NOT BE PERMITTED ON SITE WITHOUT THE EXPRESS WRITTEN APPROVAL OF ESCP.
3. ALL SYSTEMS INTENDED TO BE CONNECTED TO EXISTING FACILITIES AT ONE POINT OF COMMON COUPLING (PCC), SHALL BE IN COMPLIANCE WITH NEC ARTICLE 705.12 "POINT OF CONNECTION".
4. ALL DISCONNECTING COMBINERS, PULL/SPLICE BOXES, AND ENCLOSURES SHALL BE LISTED FOR ITS PURPOSE.
5. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS AND DIMENSIONS PRIOR TO PERFORMING ANY WORK.
6. CONTRACTOR IS RESPONSIBLE FOR ALL WASTE PRODUCED AND PROPER DISPOSAL FROM THE SITE.
7. THE PROJECT DESIGN WILL COMPLY WITH THE REQUIREMENTS OF APPLICABLE LOCAL ELECTRICAL CODES FOR THE PROJECT SITE.
8. ALL EQUIPMENT SHALL BE INSTALLED IN A SECURE AREA.
9. THE INVERTER FOR THE PROPOSED SOLAR ELECTRIC SYSTEM SHALL BE IDENTIFIED FOR USE IN SOLAR PHOTOVOLTAIC SYSTEMS.
10. ALUMINUM POWER CABLE, WIRE CONNECTORS, AND INSULATING AND CODING TAPE MANUFACTURERS SHALL BE APPROVED BY THE PROJECT OWNER PRIOR TO USAGE.
11. ALL DISCONNECTING COMBINERS SHALL BE SECURED FROM UNAUTHORIZED/UNQUALIFIED PERSONNEL BY LOCK OR LOCATION.
12. CONDUITS AND CABLES SHALL NOT ENTER THE TOP OF ANY OUTDOOR ENCLOSURE WITHOUT WRITTEN APPROVAL FROM THE PROJECT OWNER.
13. CONDUITS SHALL BE ORIENTED TO PREVENT WATER ENTRY INTO ENCLOSURES.
14. A LISTED FITTING SHALL BE USED TO PREVENT THE ENTRY OF MOISTURE WHEN TRANSITIONING FROM FREE AIR TO CONDUCTORS IN CONDUIT.
15. IF THE LOCATIONS OF SOME EQUIPMENT AND DEVICES AT WHICH CIRCUITS TERMINATE ARE APPROXIMATE ACCORDING TO THE PLAN SET, THEY SHALL BE FIELD VERIFIED BY THE CONTRACTOR. THE CONTRACTOR SHALL INSTALL EACH CIRCUIT TO THE INTENDED EQUIPMENT TERMINATION POINT WITHOUT ADDITIONAL CHARGES TO THE PROJECT OWNER, ALTHOUGH ITS FINAL LOCATION MAY SHIFT SOMEWHAT FROM THAT WHICH IS SHOWN.
16. AFTER ALL REQUIREMENTS OF THE DRAWINGS HAVE BEEN FULLY COMPLETED, REPRESENTATIVES OF THE PROJECT OWNER WILL INSPECT THE WORK. THE CONTRACTOR SHALL PROVIDE COMPETENT PERSONNEL TO DEMONSTRATE THE OPERATION OF ANY ITEM OR SYSTEM TO THE FULL SATISFACTION OF EACH REPRESENTATIVE. FINAL ACCEPTANCE OF THE WORK WILL BE MADE BY THE PROJECT OWNER AFTER DELIVERY OF RECEIPT OF APPROVAL AND RECOMMENDATION OF ACCEPTANCE FROM EACH REPRESENTATIVE.

DESIGN AND EQUIPMENT REQUIREMENTS

1. CONDOLETS SHALL NOT BE USED UNLESS APPROVED BY THE PROJECT OWNER.
2. ALL WIRING METHODS AND INSTALLATION PRACTICES SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LOCAL STATE CODES AND OTHER APPLICABLE LOCAL CODES.
3. ALL ELECTRICAL EQUIPMENT SHALL BE LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY FOR THE INTENDED PURPOSE.METALLIC L AND T CONDUIT BODIES SHALL NOT BE USED.
4. USE GASKETED HUBS LISTED FOR THE PURPOSE TO PROVIDE MOISTURE PROTECTION FOR CONDUIT ENTRANCES IN ALL APPLICABLE LOCATIONS AS REQUIRED BY NEC 314.15.
5. PROTECT WIRE FROM SHARP EDGES WITH UV RATED SPIRAL WRAP, EDGE-GUARD, OR SPLIT LOOM.
6. BENDS SHALL NOT DAMAGE THE RACEWAY OR SIGNIFICANTLY CHANGE THE INTERNAL DIAMETER OF THE RACEWAY.
7. DC CONDUCTORS USED AT GREATER THAN 600V MUST HAVE BENDING RADIUS IN COMPLIANCE WITH NEC 300.34.
8. ALL SOURCE CIRCUITS SHALL HAVE INDIVIDUAL SOURCE CIRCUIT PROTECTION FOR TESTING AND ISOLATION.
9. NO SPLICING SHALL BE PERMITTED IN MAINS OR DC FEEDERS WITHOUT PERMISSION FROM ENGINEER VIA RFI PROCESS. IF APPROVED, SPLICING SHALL BE WITHIN ENCLOSURE AND INDICATED ON FIELD REDLINES.
10. THE ELECTRICAL CONTRACTOR SHALL CONSIDER THE WEATHERING OF EQUIPMENT OVER TIME AND ELIMINATE THE POSSIBILITY OF DEGRADATION DUE TO CORROSION, WATER ENTRY AND UV EXPOSURE. AS A RESULT, THE USE OF UNISTRUT OR SIMILAR MOUNTING SYSTEMS IS REQUIRED TO MOUNT ENCLOSURES, PULL BOXES, LOAD CENTERS, FUSE BOXES, OR OTHER EQUIPMENT.
11. UNLESS OTHERWISE APPROVED ALL NEMA 4 BOXES SHALL BE EQUIPPED WITH LISTED DRAIN PLUGS INSTALLED TO ALLOW WATER TO DRAIN. ANY MODIFICATION TO AS-MANUFACTURED EQUIPMENT SHOULD BE DONE IN SUCH A WAY AS TO MAINTAIN ALL LISTED RATINGS.
12. ALL NEMA 3 BOXES SHALL BE EQUIPPED WITH A WEEP HOLE OR LISTED DRAIN PLUGS INSTALLED TO ALLOW WATER TO DRAIN.
13. ALL DC MATERIALS SHALL BE LISTED FOR 1500V DC, UNLESS OTHERWISE NOTED.
14. ALL DC AND AC COPPER TERMINATIONS SHALL HAVE KOPR-SHIELD, OR EQUIVALENT, APPLIED.
15. ALL BARE COPPER WIRES SHALL BE INSTALLED TO NOT COME INTO CONTACT WITH DISSIMILAR METALS.
16. ALL OUTDOOR ENCLOSURES REQUIRE A PROJECT OWNER-APPROVED MEANS OF VENTILATION AND DRAINAGE.
17. ALL ELECTRICAL CONDUIT, EQUIPMENT AND COMPONENTS MUST BE ADEQUATELY PROTECTED FROM DAMAGE AND VANDALISM BY THE USE OF BOLLARDS, SHIELDS, GUARDS OR OTHER ACCEPTABLE MEANS. SUCH MEANS SHALL BE SHOWN ON THE SITE PLAN AND APPROVED BY THE PROJECT OWNER.
18. SUPPORT CONDUCTORS IN VERTICAL CONDUITS IN ACCORDANCE WITH THE REQUIREMENTS OF NEC 300.19.
19. PV STRING HOME RUNS SHALL BE LABELED ON BOTH ENDS, AT ARRAY AND AT COMBINER. COMBINER OUTPUT CONDUCTORS SHALL BE LABELED AT BOTH ENDS, AT COMBINER AND AT DISCONNECT.
20. WHERE PVC CONDUIT IS USED ABOVE GRADE, THE PVC CONDUIT SHALL BE SCHEDULE 80.
21. A 6" PVC SCHEDULE 80 SLEEVE WILL BE INSTALLED TO ALL UNDERGROUND PVC TO ABOVE GROUND TRANSITIONS.
22. LIQUID TIGHT FLEXIBLE METAL CONDUIT IS GENERALLY SUITABLE FOR INSTALLATION IN WET AND DRY LOCATIONS. SHOULD IT BE EMPLOYED, SUPPORTS WILL BE NO MORE 12 INCHES FROM BOXES (JUNCTION BOX, CABINETS, OR CONDUIT FITTING) AND SPACED NO MORE THAN 36 INCHES APART (NEC 350.30).
23. LONG STRAIGHT EXPOSED OR SHALLOW BURIED CONDUIT RUNS, 100 FEET OR MORE, SHALL HAVE EXPANSION FITTINGS INSTALLED PER NEC 300.7(B). EXPANSION FITTINGS SHALL ALSO BE USED WHEN CONDUIT SPANS AN EXPANSION JOINT.
24. WIRES AND FUSES SUBJECT TO TRANSFORMER INRUSH CURRENT SHALL BE SIZED ACCORDINGLY.
25. ALL INSTALLED CIRCUIT BREAKERS THAT ARE SUBJECT TO REVERSE POWER FLOW SHALL BE LISTED AND LABELED AS BACKFEED COMPATIBLE.
26. MINIMUM WIRE SIZE FOR CURRENT CARRYING CONDUCTORS WHEN IMPLEMENTING ALUMINUM AS A CONDUCTOR SHALL BE 1/0 AWG STRANDED AND SHALL BE APPROVED BY THE PROJECT OWNER.
27. EXPOSED PV SOLAR MODULE WIRING WILL BE PV WIRE OR APPROVED EQUIVALENT, 90 DEGREE C, WET RATED AND UV RESISTANT, UNLESS OTHERWISE NOTED.
28. ALL EXPOSED CABLES, SUCH AS MODULE LEADS SHALL BE SECURED WITH MECHANICAL OR OTHER PROJECT OWNER-APPROVED SUN-LIGHT RESISTANT MEANS. UNDER NO CIRCUMSTANCES WILL PLASTIC WIRE TIES BE USED.
29. FOR ALUMINUM CONDUCTORS, WHERE BOLTED CONNECTIONS ARE NOT POSSIBLE, MECHANICAL SCREW STYLE LUGS AND TERMINATIONS ARE APPROVED ONLY WHEN USED IN CONJUNCTION WITH A LISTED COPPER PIGTAIL COMPRESSION ADAPTOR. USE OF A "ONE-SHOT" CRIMPER OR "DIE-LESS CRIMPERS" WILL NOT BE ALLOWED.
30. ELECTRICAL AND MECHANICAL CONNECTIONS AND FASTENERS TO BE TORQUED PER DEVICE LISTING OR MANUFACTURERS RECOMMENDATIONS. SUCH CONNECTIONS WILL BE MARKED WITH PERMANANT MARKING PAINT, AFTER TORQUING.
31. SPLICES/CONNECTORS SHALL BE INSULATED AND WILL REQUIRE PROJECT OWNER APPROVAL. UL LISTED ELECTRICAL TAPE ALONE IS NOT SUITABLE AS THE ONLY INSULATION MEANS. FOLLOW MANUFACTURERS INSTRUCTIONS FOR INSTALLATION, AND APPLICATION OF INSULATING PRODUCT.
32. INSULATING AND COLOR CODING TAPE SHALL BE APPROVED BY THE PROJECT OWNER.
33. ALL LV AC WIRING SHALL BE TYPE THWN-2 RATED AT 90 DEGREES C, UNLESS OTHERWISE NOTED. XHHW-2 IS AN APPROVED ALTERNATE. THIS NOTE WILL BE SUPERCEDED BY ANY INVERTER SPECIFICATIONS REQUIRING LV AC WIRE TO MEET HIGHER VOLTAGE OR INSULATION STANDARDS.
34. BONDING OF TERMINAL LUGS TO ENCLOSURES SHALL FOLLOW NEC 250.8 AND NEC 250.12.
35. RACKING COMPONENTS AND RACKING STRUCTURAL SUPPORTS WILL FORM A BONDED SYSTEM IN ACCORDANCE WITH UL 2703.
36. MODULES SHALL BE GROUNDED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
37. GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, INCLUDING BUT NOT LIMITED TO GROUND RODS, GROUNDING LUGS, GROUNDING CLAMPS, ETC.
38. ALL INSTALLED EQUIPMENT GROUNDING CONDUCTORS SHALL BE COPPER, UNLESS OTHERWISE NOTED.
39. PHOTOVOLTAIC INVERTERS SHALL COMPLY WITH THE REQUIREMENTS OF UL1741 AND IEEE 1547.

DISCONNECTING MEANS:

1. MEANS SHALL BE PROVIDED TO DISCONNECT ALL CURRENT CARRYING CONDUCTORS OF THE PHOTOVOLTAIC POWER SOURCE FROM ALL OTHER EXISTING CONDUCTORS.
2. WHERE THERE IS A GROUNDED CONDUCTOR, IT MAY HAVE A BOLTED OR TERMINAL DISCONNECTING MEANS TO ALLOW MAINTENANCE OR TROUBLESHOOTING BY QUALIFIED PERSONNEL.
3. UNLESS DISCONNECT IS SERVICING A LINE-SIDE TAP, THE DISCONNECTING MEANS SHALL NOT BE REQUIRED TO BE SUITABLE AS SERVICE EQUIPMENT AND SHALL BE RATED IN ACCORDANCE WITH NEC SECTION 690.13, UNLESS OTHERWISE NOTED.
4. THE PROJECT OWNER WILL REVIEW AND APPROVE THE LOCATIONS OF ALL PHOTOVOLTAIC DISCONNECTING MEANS.
5. MEANS SHALL BE PROVIDED TO DISCONNECT EQUIPMENT SUCH AS INVERTERS, BATTERIES, CHARGE CONTROLLERS, AND SIMILAR COMPONENTS FROM ALL UNGROUNDED CONDUCTORS OF ALL SOURCES. IF THE EQUIPMENT IS ENERGIZED FROM MORE THAN ONE SOURCE, THE DISCONNECTING MEANS SHALL BE GROUPED AND IDENTIFIED.
6. DISCONNECTING MEANS SHALL BE PROVIDED TO DISCONNECT A FUSE FROM ALL SOURCES OF SUPPLY IF THE FUSE IS ENERGIZED FROM BOTH DIRECTIONS AND IS ACCESSIBLE TO NON-QUALIFIED PERSONS. SUCH A FUSE IN A PHOTOVOLTAIC SOURCE CIRCUIT SHALL BE CAPABLE OF BEING DISCONNECTED INDEPENDENTLY OF FUSES IN OTHER PHOTOVOLTAIC SOURCE CIRCUITS.
7. ALL DISCONNECTS AND COMBINERS SHALL BE SECURED FROM UNAUTHORIZED AND UNQUALIFIED PERSONNEL BY EITHER LOCK OR LOCATION.
8. SWITCHES SHALL BE RATED NEMA TYPE 3R, UNLESS OTHERWISE NOTED.
9. SWITCHES SHALL BE RATED TO INTERRUPT THE FULL DC LOAD USING A SINGLE POLE.

INVERTER NOTES:

1. SYSTEM GROUNDING MEANS: ALL INVERTERS SHALL BE INSTALLED AS PART OF A PERMANENTLY GROUNDED ELECTRICAL SYSTEM PER THE NEC ANSI/NFPA 70. AN ENGINEERED GROUND CONNECTION FOR THE INVERTER MUST BE INSTALLED AND CONNECTED TO THE UNIT AS DESCRIBED IN THE INVERTER INSTALLATION MANUAL. GROUND CONNECTION MUST BE MADE PRIOR TO OPERATING THE UNIT.
2. KEEP ALL WIRE BUNDLES AWAY FROM ANY SHARP EDGES IN ORDER TO AVOID DAMAGE TO WIRE INSTALLATION.
3. INVERTERS SHALL BE INSTALLED IN ACCORDANCE WITH INVERTER MANUFACTURER REQUIREMENTS.
4. INVERTER ENCLOSURE: ALL INVERTER ENCLOSURES SHALL BE APPROVED BY THE PROJECT OWNER.
5. ANY ALTERATIONS TO INVERTERS MUST BE APPROVED BY THE MANUFACTURER TO MAINTAIN ITS UL LISTING AND WARRANTY.

WIRE COLOR TABLE

	AC CONDUCTORS	
	277/480 V	120/208V
PHASE A	BROWN	BLACK
PHASE B	ORANGE	RED
PHASE C	YELLOW	BLUE
GROUNDED CONDUCTOR	GRAY OR WHITE	WHITE
EQUIPMENT GROUNDING CONDUCTOR	GREEN OR BARE	GREEN OR BARE
GROUNDING ELECTRODE CONDUCTOR	GREEN W/ ORANGE	GREEN W/ ORANGE
	DC CONDUCTORS	
UNGROUNDED CONDUCTOR*	(+) FROM MODULE RED WIRE *	(-) FROM MODULE BLACK WIRE*
GROUNDING CONDUCTOR	GREEN OR BARE	GREEN OR BARE

REV #	DESCRIPTION	DATE	BY
1	UPDATES PER DEC COMMENTS	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT
CITY OF BUFFALO — ERIE COUNTY, NY

CONSTRUCTION NOTES
SHEET 1

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LICENSED PROFESSIONAL ENGINEER — STATE OF NEW YORK — JENNIFER SUZANNE GRANT — 120556
9/5/2024

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		DESIGNED BY: TSB, JAT	
SCALE	AS SHOWN	CHECKED BY: TSB, JSC	C&A JOB# 5566.03
		APPROVED BY: JSC	DRAWING: T-0.1

ELECTRICAL NOTES:

1. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL EQUIPMENT AND FOLLOWING ALL MANUFACTURER'S OR ENGINEER'S DIRECTIONS AND INSTRUCTIONS SHOWN HERE.
2. THIS SOLAR PHOTOVOLTAIC SYSTEM IS TO BE INSTALLED FOLLOWING THE CONVENTIONS OF THE NATIONAL ELECTRIC CODE (NEC). ALL REFERENCES TO THE NEC IN THE CONTRACT DRAWINGS REFER TO THE 2017 NEC. ANY LOCAL CODES WHICH MAY SUPERCEDE THE NEC SHALL GOVERN.
3. THE ELECTRICAL CONTRACTOR IS ADVISED THAT ALL DRAWINGS & COMPONENT MANUALS, ESPECIALLY THE INVERTER MANUALS, ARE TO BE READ AND UNDERSTOOD PRIOR TO INSTALLATION OR ENERGIZING OF ANY EQUIPMENT. THE CONTRACTOR IS ALSO ADVISED TO HAVE ALL COMPONENT SWITCHES IN THE OFF (OPEN) POSITION AND FUSES REMOVED PRIOR TO INSTALLATION OF FUSE-BEARING COMPONENTS.
4. DRAWINGS ARE DIAGRAMMATIC AND DO NOT REFLECT EXACT OR ENTIRE ROUTE OF CABLES AND ELECTRICAL EQUIPMENT. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS, DISTANCES AND OBSTRUCTIONS.
5. ALL ITEMS OF WORK NEEDED FOR A COMPLETE AND FUNCTIONAL SYSTEM SHALL BE FURNISHED AND INSTALLED COMPLETE IN ALL DETAIL AND READY FOR OPERATION OR SERVICE. APPARATUS REQUIRED SHALL BE FURNISHED AND INSTALLED ALTHOUGH NOT SPECIFICALLY MENTIONED HEREIN OR SHOWN ON THE DRAWINGS.
6. ALL ROWS OF MODULES SHALL BE LABELED ON BOTH ENDS TO REFLECT THE ROW NUMBERING OUTLINED ON THE STRING LAYOUT DRAWING SHEET(S).
7. INSTALLATION CREW IS TO HAVE MINIMUM LISCENSING/CERTIFICATION AS REQUIRED BY LOCAL LAW. AT MINIMUM, ONE JOURNEYMAN LEVEL ELECTRICIAN OR ONE NABCEP CERTIFIED WORKER MUST BE ON SITE AT ALL TIMES WHEN ELECTRICAL WORK IS BEING PERFORMED.
8. FOR SAFETY IT IS RECOMMENDED THE INSTALLATION CREW ALWAYS HAVE A MINIMUM OF TWO PEOPLE WORKING TOGETHER.
9. ALL COMPONENTS TO BE INSTALLED WITH THIS SYSTEM ARE TO BE LISTED BY A THIRD PARTY TESTING AGENCY (UL, ETI., ETC.). EQUIPMENT SHALL BE NEMA 3R OUTDOOR RATED OR BETTER UNLESS OTHERWISE NOTED.
10. THE CONTRACTOR IS RESPONSIBLE FOR SELECTING AND PURCHASING EQUIPMENT THAT WILL LAST THE LIFETIME OF THE PV SYSTEM. ALL ENCLOSURES, CONDUITS, STRAPS, PAINTED METAL SURFACES, CONCRETE, GROUNDING EQUIPMENT, AND OTHER PRODUCTS SHALL BE SELECTED TO LAST THE LIFETIME OF THE PV MODULES. THE ENGINEER SPECIFIES THE MINIMUM REQUIRED EQUIPMENT AND SPECIFICATIONS TO ACCOMPLISH THE PROJECT AND THE ELECTRICAL CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THESE SPECIFICATIONS ARE MET OR EXCEEDED WITH GOOD QUALITY EQUIPMENT, WORKMANSHIP AND SKILL.
11. DC VOLTAGE FROM THE ARRAY IS ALWAYS PRESENT AT THE DC DISCONNECT ENCLOSURE AND THE DC TERMINALS OF THE INVERTER DURING DAYLIGHT HOURS. ALL PERSONS WORKING ON OR INVOLVED WITH THIS PHOTOVOLTAIC SYSTEM MUST BE WARNED THAT SOLAR MODULES ARE ENERGIZED WHEN EXPOSED TO DAYLIGHT. THE LINE AND LOAD TERMINALS ON THE DC DISCONNECTS MAY BE ENERGIZED IN THE OPEN POSITION AND THE SWITCH IS TO BE LABELED TO COMPLY WITH ARTICLE 690.13 OF THE NEC REFLECTING THIS.
12. ALL PORTIONS OF THIS SOLAR ELECTRIC SYSTEM SHALL BE CLEARLY MARKED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE.
13. THE ELECTRICAL CONTRACTOR SHALL PERFORM INITIAL HARDWARE CHECKS AND PV/WIRING CONDUCTIVITY CHECKS PRIOR TO TERMINATING ANY WIRES. ALL AC AND DC WIRE RUNS SHALL BE TESTED FOR INSULATION RESISTANCE.
14. ALL JUNCTION BOXES AND OTHER LOCATIONS WHERE MODULE WIRING CONNECTIONS ARE MADE SHALL BE ACCESSIBLE. CLEARANCES AND ACCESSIBILITY AROUND ELECTRICAL EQUIPMENT SHALL CONFORM TO ALL APPLICABLE CODES.
15. FOR PROPER MAINTENANCE AND ISOLATION OF INVERTERS, REFER TO ISOLATION PROCEDURE IN INVERTER OPERATIONS MANUAL. CONTRACTOR PERFORMING THE MAINTENANCE IS RESPONSIBLE TO FOLLOW ALL LOCKOUT/TAGOUT PROCEDURES.
16. THE GROUNDING OF THE PHOTOVOLTAIC SYSTEM SHALL COMPLY WITH ARTICLES 250 AND 690 OF THE NEC. IF THE REQUIREMENTS DESCRIBED IN THIS DRAWING ARE CLOSELY FOLLOWED, THE GROUNDING REQUIREMENT WILL BE MET. ANY CHANGES WILL NEED TO BE REVIEWED AND DEEMED ACCEPTABLE BY THE ENGINEER, MANUFACTURER AND LISTING AGENCY FOR PRODUCT SAFETY.
17. THE CONTRACTOR IS RESPONSIBLE FOR MOUNTING ALL EQUIPMENT PER THE ENGINEER REPORT OR MANUFACTURER'S SPECIFICATIONS. IF SPECIFICATIONS ARE NOT APPARENT, THE CONTRACTOR SHALL USE DILIGENT EFFORTS TO MOUNT EQUIPMENT SUCH THAT IT WILL BE CLEAN, LEVEL, AND SOLID IN ORDER TO LAST THE LIFETIME OF THE SOLAR ELECTRICAL SYSTEM.
18. ANY METAL CHIPS RESULTING FROM SITE WORK SHALL BE CLEANED FROM ENCLOSURES, ROOF SURFACE, GROUND SURFACE, AND ANY ADDITIONAL AREA WHERE OXIDIZED OR CONDUCTIVE METAL SHAVINGS MAY CAUSE RUST, ELECTRICAL SHORT CIRCUITS, OR OTHER DAMAGE.
19. THE ELECTRICAL CONTRACTOR SHALL CONSIDER THE WEATHERING OF EQUIPMENT OVER TIME AND ELIMINATE THE POSSIBILITY OF DEGRADATION OF EQUIPMENT DUE TO WATER ENTRY AND UV EXPOSURE. AS A RESULT, WE REQUIRE THE USE OF UNISTRUT OR SIMILAR MOUNTING SYSTEMS TO MOUNT ENCLOSURES, PULL BOXES, LOAD CENTERS, FUSE BOXES, OR OTHER EQUIPMENT TO PREVENT WATER BUILD-UP.
20. METHOD(S) FOR REMOVING AND PREVENTING THE BUILD-UP OF WATER OR MOISTURE SHALL BE PROVIDED IN ENCLOSURES WHERE CONDENSATION OR WATER BUILD-UP MAY OCCUR. MODIFICATION OF COMPONENTS AND ENCLOSURES SHALL COMPLY WITH THE MANUFACTURER'S RECOMMENDATIONS AND SHALL NOT VOID NEMA RATING AS SPECIFIED PER PLAN. CARE SHOULD BE TAKEN TO PREVENT PEST INTRUSION INTO ENCLOSURES WITH THE CHOSEN METHOD(S).
21. INSTALLER AND OWNER/OPERATOR SHALL SUPPLY ALL SITE AND EQUIPMENT LABELS AS REQUIRED BY NFPA 70E, OSHA, AND ANY OTHER CODES/AUTHORITIES NOT SPECIFIED IN THIS PLAN SET.
22. CONTRACTOR TO COORDINATE WITH OTHER TRADES FOR EXACT EQUIPMENT PLACEMENT AND REQUIREMENTS.
23. IN EVERY PULL BOX, TERMINAL BOX, AND AT ALL PLACES WHERE WIRES MAY NOT BE READILY IDENTIFIED BY NAMEPLATE MARKINGS ON THE EQUIPMENT TO WHICH THEY CONNECT, IDENTIFY EACH CIRCUIT WITH A PLASTIC LABEL OR TAG FOR NUMBER POLARITY OR PHASE.
24. THE LAYOUT OF CONDUIT SHOWN IN THESE PLANS IS INDICATIVE ONLY. CONTRACTOR SHALL ROUTE AND LOCATE THE CONDUITS TO SUIT SITE CONDITIONS BUT SHALL NOT EXCEED MAXIMUM CONDUCTOR LENGTHS IDENTIFIED ON THE WIRE SCHEDULE. CONTRACTOR SHALL COORDINATE ALL CHANGES IN WIRING AND CONDUIT WITH THE ENGINEER.
25. WHERE WIRE AND CABLE ROUTING IS NOT SHOWN AND DESTINATION ONLY IS INDICATED, OR MAXIMUM CONDUCTOR LENGTHS WILL BE EXCEEDED, CONTRACTOR SHALL DETERMINE EXACT ROUTING AND LENGTHS REQUIRED. A SKETCH OF THE PROPOSED INSTALLATION SHALL BE SUPPLIED TO THE ENGINEER OF RECORD PRIOR TO INSTALLATION.
26. BENDS SHALL NOT DAMAGE THE RACEWAY OR SIGNIFICANTLY CHANGE THE INTERNAL DIAMETER OF RACEWAYS (NO KINKS).
27. SUPPORT CONDUCTORS IN VERTICAL CONDUITS IN ACCORDANCE WITH THE REQUIREMENTS IN NEC 300.19.
28. INSTALL ALL WIRING MATERIALS IN A NEAT WORKMANLIKE MANNER. USE GOOD TRADE PRACTICES AS REQUIRED BY CHAPTER 3 OF THE NEC.
29. INSTALL CONDUIT TO MAINTAIN PROPER CLEARANCES AND IN A NEAT INCONSPICUOUS MANNER. PROVIDE BOXES, FITTINGS, AND BENDS FOR CHANGES IN DIRECTION. FASTEN CONDUIT SECURELY IN PLACE.
30. ALL CONDUIT SHALL BE INDEPENDENTLY SUPPORTED FROM BUILDING STRUCTURES. CONDUIT SHALL NOT BE SUPPORTED FROM VENTILATION DUCTS, MECHANICAL PIPING, SUSPENDED CEILING GRIDS, OR THEIR HANGERS.
31. ALL EXTERIOR CONDUIT AND EQUIPMENT FITTINGS MUST BE WATERTIGHT.
32. PROVIDE PULL, JUNCTION, OR SECTIONALIZING WHERE REQUIRED TO FACILITATE THE INSTALLATION OF WIRING IN ADDITION TO THOSE SHOWN ON THE DRAWINGS. BENDS IN CONDUITS BETWEEN PULL BOXES SHALL NOT EXCEED THE EQUIVALENT OF FOUR 90 DEGREE BENDS.
33. WHEN FIELD CUTTING IS REQUIRED, THE CONDUIT SHALL BE CUT SQUARE AND DEBURRED.
34. CONDUIT SIZES NOT SPECIFIED SHOULD CONFORM TO NEC SPECIFICATIONS TO INCLUDE FILL FACTOR AND DERATING FOR NUMBER OF CONDUCTORS WITH A MINIMUM CONDUIT SIZE BEING 3/4".
35. THE MINIMUM ALLOWABLE WIRE SIZE FOR POWER CONDUCTORS IS #12 AWG. DATA AND COMMUNICATION WIRING MAY BE A SMALLER GAUGE, AND SHALL BE SIZED FOR THE APPLICATION.
36. THE WIRING SIZE IS BASED ON THE ESTIMATED CONDUIT ROUTING AS SHOWN IN THIS DRAWING PACKAGE. SHOULD CONDUIT LENGTH INCREASE DUE TO RELOCATION OF SOURCE AND/OR ROUTING, THE CONDUITS AND THE CONDUCTORS MAY NEED TO BE RESIZED. PLEASE CONTACT THE ENGINEER PRIOR TO MAKING ANY FIELD CHANGES.
37. ALL UL LISTED WIRE CONNECTIONS MUST BE TORQUED PER EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS AND THEN MARKED TO INDICATE IF TAMPERED.
38. IF NOT DESIGNATED BY A SCHEDULE WITHIN THIS DESIGN, ALL CONDUIT SHALL BE GALVANIZED EMT OR RMC METAL CONDUIT.
39. RMC, IMC, OR EMT CONDUIT RUNS, WHERE SUBJECT TO THERMAL EXPANSION AND CONTRACTION, MUST INCORPORATE UL LISTED EXPANSION JOINTS OR LIQUIDTIGHT FLEX METAL CONDUIT TO ALLOW FOR THE MOVEMENT. DO NOT USE RIGID METAL EXPANSION JOINTS FOR EMT.
40. ALL WIRE MUST HAVE ADEQUATE STRAIN RELIEF. THERE MUST BE ADEQUATE WIRE SLACK TO ALLOW FOR THERMAL EXPANSION AND CONTRACTION OF CONDUIT RUNS WITHOUT STRAINING ANY CONDUCTOR OR CONNECTION.
41. WHERE PORTIONS OF A RACEWAY ARE SUBJECT TO DIFFERENT TEMPERATURES WHERE PASSING FROM INTERIOR TO THE EXTERIOR OF A BUILDING, THE RACEWAY SHALL BE FILLED WITH AN APPROVED MATERIAL TO PREVENT THE CIRCULATION OF WARM AIR TO A COLDER SECTION OF THE RACEWAY.
42. IF NOT DESIGNATED BY A SCHEDULE WITHIN THIS DESIGN, ALL WIRING SHALL BE RATED FOR ITS APPLICATION. WIRE IN CONDUIT SHALL BE THWN-2 OR XHHW-2, AND 90 DEGREE CELSIUS RATED. DIRECT BURIED OR EXPOSED CONDUCTORS SHALL BE RATED FOR THAT ENVIRONMENT.
43. THE ELECTRICAL CONTRACTOR IS REQUIRED TO USE PERMANENTLY COLOR CODED INSULATION PER THE WIRE INSULATION COLOR CODE TABLE SHOWN ON THE DETAILS SHEET. PHASE TAPING BLACK CONDUCTORS DOES NOT MEET THIS REQUIREMENT. THE CONTRACTOR ACCEPTS ALL RISK AND LIABILITY IF THESE INSTRUCTIONS ARE NOT FOLLOWED.
44. STRING HOME RUNS AND EXTENSIONS SHALL USE CONNECTORS THAT ARE UL LISTED WEATHERPROOF, UV RESISTANT, FINGERSAFE PLUG-IN CONNECTORS. CONNECTORS SHALL BE OF LATCHING OR LOCKING TYPE. CONNECTORS READILY ACCESSIBLE AND OPERATING AT OVER 30V SHALL REQUIRE TOOL TO OPEN AND SHALL BE MARKED: "DO NOT DISCONNECT UNDER LOAD" OR "NOT FOR CURRENT INTERRUPTING" IN ACCORDANCE WITH NEC 690.33. ALL CONDUITS SHALL BE FREE OF ANY OBSTRUCTIONS AND PROPERLY SECURED BEFORE WIRE IS PULLED.
45. ALL UNDERGROUND CABLE SHALL BE MAPPED AND IDENTIFIED ALONG THEIR ENTIRE RUN WITH MYLAR HAZARD TAPE AS SHOWN.
46. DC WIRING AND COMMUNICATIONS CAN AND SHOULD USE WIREWAYS ON RACKING WHENEVER POSSIBLE.
47. WHERE CONDUIT DOES NOT TERMINATE AT A BOX, CONTRACTOR SHALL PROVIDE BELL ENDS AND SEAL WITH EXPANDING FOAM RATED FOR USE WITH WIRING.
48. ALL AGGREGATION PANEL MAIN AND INTERTIE CIRCUIT BREAKERS OR FUSES SHALL BE RATED FOR BIDIRECTIONAL CURRENT. DO NOT USE BREAKERS WITH LINE AND LOAD SIDE INDICATED.
49. ALL METALLIC CONNECTORS AND FITTINGS SHALL BE NON-CORRODING, SUCH AS ALUMINUM, STAINLESS STEEL OR GALVANIZED.
50. ARRANGE CONDUIT TO MAINTAIN HEADROOM AND IN A NEAT INCONSPICUOUS MANNER. RUN PARALLEL AND AT RIGHT ANGLES TO STRUCTURAL MEMBERS. PROVIDE BOXES, FITTINGS AND BENDS FOR CHANGE IN DIRECTION. FASTEN CONDUIT SECURELY IN PLACE.
51. SUPPORT CONDUIT USING STEEL OR MALLEABLE IRON STRAPS, LAY-IN ADJUSTABLE HANGERS, CLEVIS HANGERS AND SPLIT-HANGERS. HANGER SPACING SHALL BE 10 FT MAXIMUM. USE APPROVED BEAM CLAMPS FOR CONNECTION TO STRUCTURAL MEMBERS.
52. SAFETY REGULATIONS (LOCK OUT-TAG OUT, ETC.) MUST BE OBSERVED BY THE CONTRACTOR DURING CONSTRUCTION. CONTRACTOR SHALL PROVIDE ALL NECESSARY EQUIPMENT, SIGNS, LABELS, LOCKS AND KEYS.
53. ELECTRICAL CONTRACTOR SHALL PROVIDE SIGNAGE AS SHOWN ON THESE DRAWINGS AND PER NEC ARTICLE 690 AND ALL OTHER APPLICABLE ARTICLES.
54. UNLESS OTHERWISE INDICATED, GROUND ALL EXPOSED NONCURRENT-CARRYING METALLIC PARTS OF ELECTRICAL EQUIPMENT, RACEWAY SYSTEMS, EQUIPMENT STRUCTURES AND THE NEUTRAL OF ALL WIRING SYSTEMS IN ACCORDANCE WITH THE NEC, STATE, AND OTHER APPLICABLE LAWS AND REGULATIONS. PROVIDE SEPARATE GROUNDING CONDUCTORS WITH ALL APPLICABLE CIRCUITS AND IN ALL CONDUITS.
55. RECEPTACLES SHALL BE DUPLEX AND RATED 20 AMPS AT 120 VAC, 2 POLE, 3 WIRE, NEMA TYPE 5-20R AND SPECIFICATION GRADE. ALL RECEPTACLES SHALL BE GFI AND WEATHERPROOF TYPE. DEVICE COVER PLATES SHALL BE SUITABLE FOR THE ENVIRONMENT IN WHICH THEY ARE INSTALLED AND THE TYPE OF SERVICE THEY ARE USED FOR.
56. HEAVY DUTY RATED SWITCHES FUSED OR NON-FUSIBLE AS INDICATED ON THE DRAWINGS, SHALL BE PROVIDED AS REQUIRED. GENERAL DUTY SWITCHES WILL NOT BE ALLOWED. SWITCHES SHALL HAVE "QUICK-BREAK" ACTUATING MECHANISMS AND SHALL BE ENCLOSED AS REQUIRED BY THE CONDITIONS OF INSTALLATION. THE COVER SHALL BE INTERLOCKED WITH THE SWITCH SUCH THAT THE ENCLOSURE CANNOT BE OPENED WITH THE SWITCH IN THE "ON" POSITION. THE "ON" AND "OFF" POSITION SHALL BE CLEARLY MARKED BY THE MANUFACTURER. THE SWITCH SHALL BE CAPABLE OF BEING LOCKED IN THE OPEN POSITION. PROVIDE ENCLOSURES SUITABLE FOR THE SPECIFIC TYPE OF LOCATION IN WHICH THEY ARE INSTALLED. ENCLOSURES SHALL BE LOCKABLE. PROVIDE VISIBLE BLADES SWITCHES WHERE REQUIRED BY CODE OR UTILITY. DISCONNECT SWITCHES SHALL BE MANUFACTURED BY CUTLER-HAMMER, SQUARE D OR EQUAL.
57. CONTRACTOR SHALL BE REQUIRED TO REVIEW CONDUIT AND WIRING ROUTING TO PREVENT MOISTURE FROM ENTERING ANY EQUIPMENT BOXES. PROVIDE SUBMITTALS TO PROJECT OWNER AND PROJECT OWNER'S REPRESENTATIVE FOR APPROVAL OF ANY BRANCH OR SOURCE CIRCUIT TO ANY EQUIPMENT BOXES, WEATHER HEADS, AND WHERE CONDUIT STUBS UP.
58. ALL CONDUIT SHALL BE INSTALLED TO ACCOMMODATE EXPANSION AND CONTRACTION DUE TO AMBIENT TEMPERATURE CHANGES.
59. ALL POWER AND DATA WIRING SHALL BE LISTED FOR WET CONDITIONS.
60. COMPLY WITH PROJECT OWNER CLOSE-OUT, TESTING, INSPECTION, AND COMMISSIONING REQUIREMENTS.
61. THIS PHOTOVOLTAIC SYSTEM'S UTILITY INTERCONNECTION POINT SHALL MEET THE SPECIFIC REQUIREMENTS OF ARTICLE 690 AND ARTICLE 705 OF THE NATIONAL ELECTRICAL CODE. FOLLOW THE SPECIFIC INSTRUCTIONS IN THIS DRAWING SET TO MEET THIS CODE REQUIREMENT.

MODULE NOTES:

1. REFER TO THE MODULE MANUAL FOR MORE DETAILS ON RIGGING, UNPACKING, HANDLING, PLANNING, AND INSTALLATION.
2. THE MODULES MAY BE SHIPPED WITH SEVERAL MODULES PER BOX. TAKE CARE WHEN OPENING THE BOX TO ENSURE THAT ALL MODULES ARE SECURELY HANDLED.
3. NEVER LEAVE A MODULE UNSUPPORTED OR UNSECURED. CONTRACTOR IS RESPONSIBLE FOR ALL MATERIAL HANDLING ON THE JOB SITE.
4. UPON RECEIPT, CONTRACTOR SHALL INSPECT MODULE SHIPMENTS FOR SIGNS OF DAMAGE. CONTRACTOR SHALL ALSO INSPECT MODULES FOR DAMAGE DURING INSTALLATION.
5. CONTRACTOR SHALL QUARANTINE MODULES SUSPECTED OF DAMAGE. IF DAMAGE IS FOUND ON PANELS IN BUNDLES OR PALLETS, THE ENTIRE BUNDLE OR PALLET SHALL BE QUARANTINED FOR FURTHER INSPECTION/TESTING.
6. CONTRACTOR SHALL RECORD, TRACK, AND REPORT DAMAGED MODULE QUANTITIES TO EPC REPRESENTATIVE.

COMMISSIONING NOTES:

1. PRIOR TO FINAL REQUEST FOR PAYMENT, CONTRACTOR SHALL PROVIDE THE SERVICES OF A THIRD PARTY ELECTRICAL INSPECTOR TO OBTAIN A CERTIFICATE OF INSPECTION.
2. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING, SCHEDULING, PAYING FOR, AND DOCUMENTING ALL INSPECTIONS OR TESTING REQUIRED BY THE AHJ AND UTILITY, INCLUDING BUT NOT LIMITED TO PROGRESS INSPECTIONS, TRANSFORMER TEST RESULTS, RELAY FUNCTIONAL TESTING, CT RATIO AND SATURATION TESTING, PT TESTING, GROUND GRID RESISTANCE TESTING, CIRCUIT BREAKER ACCEPTANCE TESTING, VERIFICATION OF ADEQUACY OF DC BATTERY SUPPLY, OR ANTI-ISLANDING UTILITY WITNESS TESTING.

SOLAR ARRAY COMMISSIONING:

1. BEFORE CLOSING DISCONNECTS, CONNECTING STRINGS, OR ATTEMPTING TO ENERGIZE THE INVERTERS, THE FOLLOWING COMMISSIONING PROCEDURE SHALL BE COMPLETED (IN THIS ORDER). TESTS SHALL BE PERFORMED UNDER THE DIRECTION OF A NABCEP CERTIFIED INSTALLER USING TEST PROCEDURES DEFINED BY THE MOST RECENT VERSION OF IEC 62446. ALL TEST RESULTS ARE SUBJECT TO THE REVIEW OF THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING AND INSTALLING ANY CORRECTIVE ACTION REQUIRED BY THE ENGINEER IN ORDER TO SATISFY TEST CRITERIA.
   - 1.1. TEST THE CONTINUITY OF ALL CONNECTIONS BETWEEN ALL BONDING JUMPERS AND THE GROUNDING ELECTRODE SYSTEM (RACKING, MODULES, EQUIPMENT BOXES, GROUND RINGS OR RODS, AND ANY OTHER METALLIC COMPONENTS REQUIRED TO BE BONDED TO THE GES PER THE DESIGN DRAWINGS). PRIOR TO SITE INSPECTION BY THE ENGINEER, CONTRACTOR SHALL PHYSICALLY MARK ALL CONNECTIONS THAT WERE TESTED FOR CONTINUITY, AND SHALL PREPARE DOCUMENTATION OF CONTINUITY TEST RESULTS.
   - 1.1. TEST POLARITY OF ALL DC CABLES. FOR SYSTEMS WITH INVERTERS AND/OR DC COMBINER BOXES THAT AUTOMATICALLY DETECT POLARITY ERRORS, ADDITIONAL TESTING AND DOCUMENTATION IS NOT REQUIRED. ON OTHER INVERTERS, CONTRACTOR SHALL PROVIDE A CHECKLIST DOCUMENTING THAT ALL DC CIRCUITS WERE CHECKED FOR POLARITY PRIOR TO ENERGIZING.
   - 1.2. WHERE DC COMBINER BOXES (DCCB) ARE INSTALLED, PERFORM PV COMBINER BOX TESTING TO FURTHER CONFIRM THE ABSENSE OF REVERSE POLARITY CONDITIONS. CONTRACTOR SHALL PROVIDE A CHECKLIST DOCUMENTING THAT ALL DC CIRCUITS WERE CHECKED FOR POLARITY PRIOR TO ENERGIZING.
   - 1.3. TEST THE OPEN CIRCUIT VOLTAGE (VOC) ON ALL SOURCE CIRCUITS AND CONFIRM MAXIMUM VOLTAGE LIMITS ARE NOT EXPECTED TO BE EXCEEDED AFTER ENERGIZING. IV CURVE TESTING MAY BE USED TO VERIFY VOC IF COMPLETED AT THIS STAGE IN COMMISSIONING.
   - 1.4. TEST THE SHORT CIRCUIT CURRENT (ISC) FOR EACH SOURCE CIRCUIT TO CONFIRM MAXIMUM CURRENT LIMITS ARE NOT EXPECTED TO BE EXCEEDED AFTER ENERGIZING. IV CURVE TESTING MAY BE USED TO VERIFY ISC IF COMPLETED AT THIS STAGE IN COMMISSIONING.
   - 1.5. CHECK THAT ALL FUSES, DISCONNECTS AND OTHER BALANCE OF SYSTEM COMPONENTS ARE RATED FOR THEIR INTENDED USE.
   - 1.6. COMPLETE A VISUAL INSPECTION OF ALL THE MODULES TO CHECK FOR BROKEN GLASS, FRAYED WIRES, EXPOSED CONDUCTORS AND ANY OTHER PROBLEMS THAT MAY CAUSE A FAULT.
   - 1.7. TEST FUNCTIONALITY OF ALL SWITCHES, DISCONNECTS, CIRCUIT BREAKERS, AND ANY OTHER CONTROL APPARATUS. CONTRACTOR TO PROVIDE A LIST OF ALL EQUIPMENT THAT WAS TESTED WITH NOTES ON WHAT WAS CHECKED, AND ANY OBSERVED ABNORMALITIES. THE ENGINEER OR INOVATEUS SOLAR MAY REQUEST ADDITIONAL FUNCTIONAL TESTING AS NEEDED TO CONFIRM ALL EQUIPMENT IS FUNCTIONING AS NEW AT THE COMPLETION OF COMMISSIONING. FUNCTIONAL TESTS THAT REQUIRE THE AC SUPPLY TO BE PRESENT, SUCH AS INVERTER ANTI-ISLANDING TESTING, SHALL BE PERFORMED AFTER ENERGIZING THE INVERTERS.
   - 1.8. TEST INSULATION RESISTANCE OF ALL AC AND DC CIRCUITS.
     - 1.8.1. BEFORE IRT TESTING THE SOLAR MODULES, CONTRACTOR SHALL CONFIRM WITH THE MODULE MANUFACTURER THAT TESTING WILL NOT DAMAGE THE INTERNAL DIODES OR VOID THE WARRANTY. CONTRACTOR TO FOLLOW ALL MANUFACTURER REQUIREMENTS.
     - 1.8.2. REFER TO INOVATEUS SOLAR PROVIDED TESTING SPREADSHEET FOR SPECIFIC VOLTAGE AND MINIMUM VOLTAGE.
     - 1.8.3. WHERE PERMISSIBLE BY THE MODULE MANUFACTURER, IRT TESTING MAY BE PERFORMED ON MULTIPLE DC CIRCUITS AT ONCE USING "TEST METHOD B" IN IEC 62446. IF RESULTS ARE NOT ACCEPTABLE, CONTRACTOR TO TEST SUBSETS OF THE FULL ARRAY UNTIL THE COMPROMISED CABLE IS IDENTIFIED.
     - 1.8.4. WHERE MINIMUM INSULATION RESISTANCE IS NOT ACHIEVABLE ON AN INDIVIDUAL CIRCUIT, CONTRACTOR MAY SUBMIT DATA TO ENGINEER FOR REVIEW. THE ENGINEER MAY REQUIRE CONTRACTOR PERFORM WET INSULATION TESTING ON QUESTIONABLE CIRCUITS. CONTRACTOR SHALL REPLACE ANY CONDUCTORS THAT ARE NOT DEEMED ACCEPTABLE BY THE ENGINEER.

INVERTER COMMISSIONING:

1. BEFORE TURNING THE INVERTER ON, OR CLOSING ANY OF THE INVERTER DISCONNECTS, THE FOLLOWING COMMISSIONING PROCEDURE SHALL BE COMPLETED:
   - 1.1 CHECK AC INPUT VOLTAGE IS IN THE PROPER PHASE SEQUENCE (CLOCKWISE) IF APPLICABLE.
   - 1.2 CHECK THAT THE AC GRID VOLTAGE AT THE INVERTER AC TERMINALS IS WITHIN THE PROPER RANGE AS DEFINED BY THE INVERTER RATING LABEL AND ACCOMPANIED MANUAL.
   - 1.3 FOLLOW START-UP SEQUENCE IN MANUFACTURER'S OPERATION AND MAINTENANCE MANUAL.

PERFORMANCE TESTING:

1. SEE EXHIBIT H OF THE CONTRACT.

O&M NOTES:

1. THE FACILITY SHALL BE OPERATED AND MAINTAINED IN ACCORDANCE WITH SOLAR INDUSTRY BEST PRACTICES, NFPA 70E, AND ALL APPLICABLE OSHA REQUIREMENTS.
2. THE FACILITY SHALL COMPLY WITH THE FOLLOWING FIRE MITIGATION PLAN PER NEC 691.10:
   - 2.1. PERFORM INSPECTION OF THE PV ARRAY USING IR IMAGING, DURING COMMISSIONING AND ANNUALLY THEREAFTER TO IDENTIFY POTENTIAL ARC FAULTS VIA THERMAL MEANS, WITH PARTICULAR ATTENTION TO ALL MC4 CONNECTIONS BETWEEN PV MODULES.

STATE OF NEW YORK · HAMEED SUZANNE CRAWFORD · 110556 · LICENSED PROFESSIONAL ENGINEER

9/5/2024

REV #	DESCRIPTION	DATE	BY

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

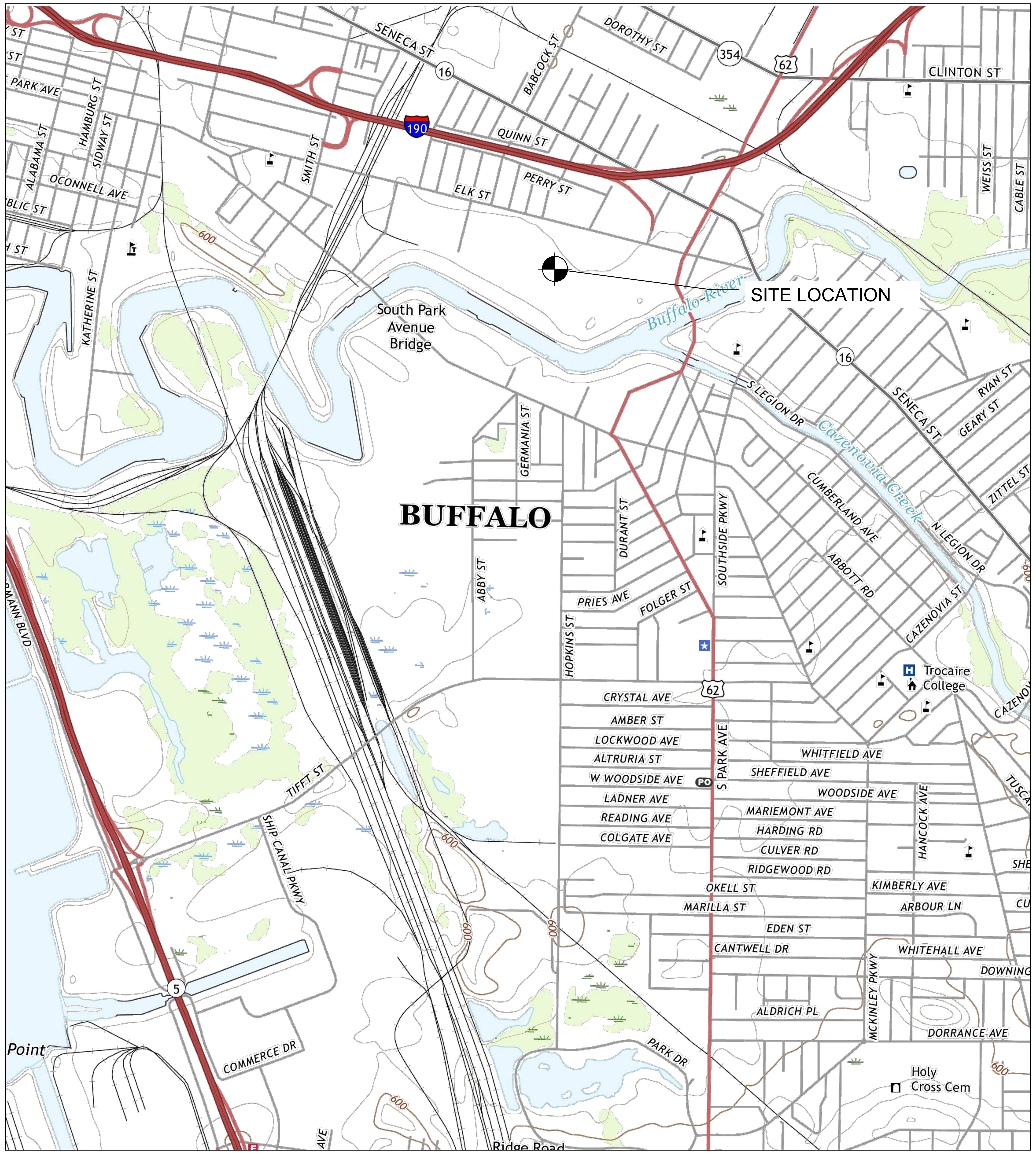
CONSTRUCTION NOTES
SHEET 2

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

DATE	DRAWN BY: TSB, JAT, ESA	H:\WORK\5566.02 Elk Street\DWG\5566.02 TITLE AND NOTES.dwg
9/5/2023	DESIGNED BY: TSB, JAT	
SCALE	CHECKED BY: TSB, JSC	C&A JOB#
AS SHOWN	APPROVED BY: JSC	5566.03

DRAWING: T-0.2



GRAPHIC SCALE

1000 0 500 1000 2000 4000

(IN FEET)
1 inch = 1000 ft.

DRAWING NOTES:

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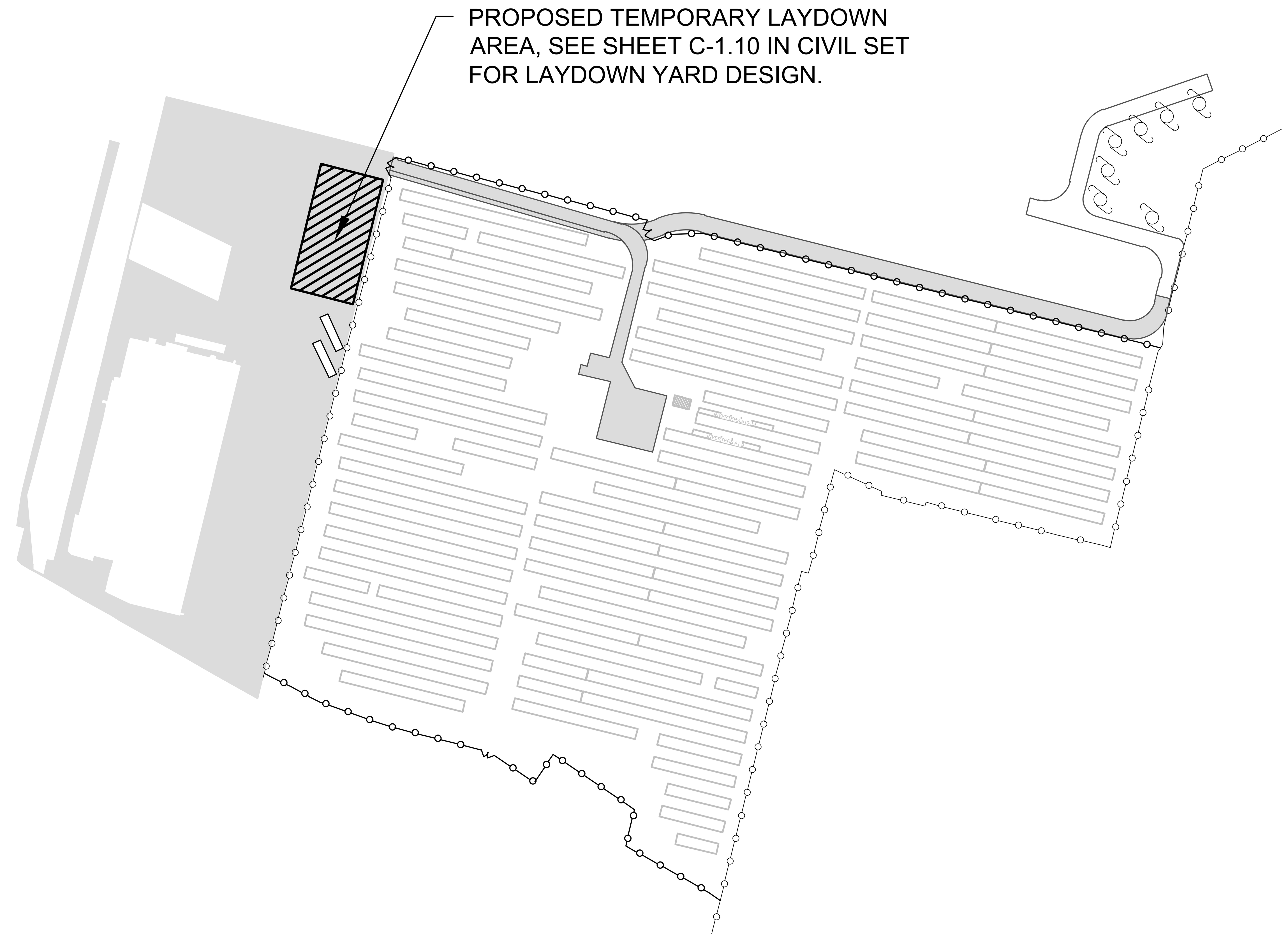
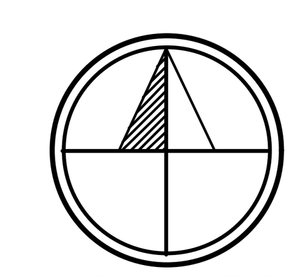


GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.



NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

REV #	DESCRIPTION	DATE	BY

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

CONSTRUCTION
ACCESS AND STAGING

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

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ENGINEERING & LAND SURVEYING, PC
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STATE OF NEW YORK ★ JENNIFER SUZANNE CRAWFORD ★ LICENSED PROFESSIONAL ENGINEER 100566
3/22/2024

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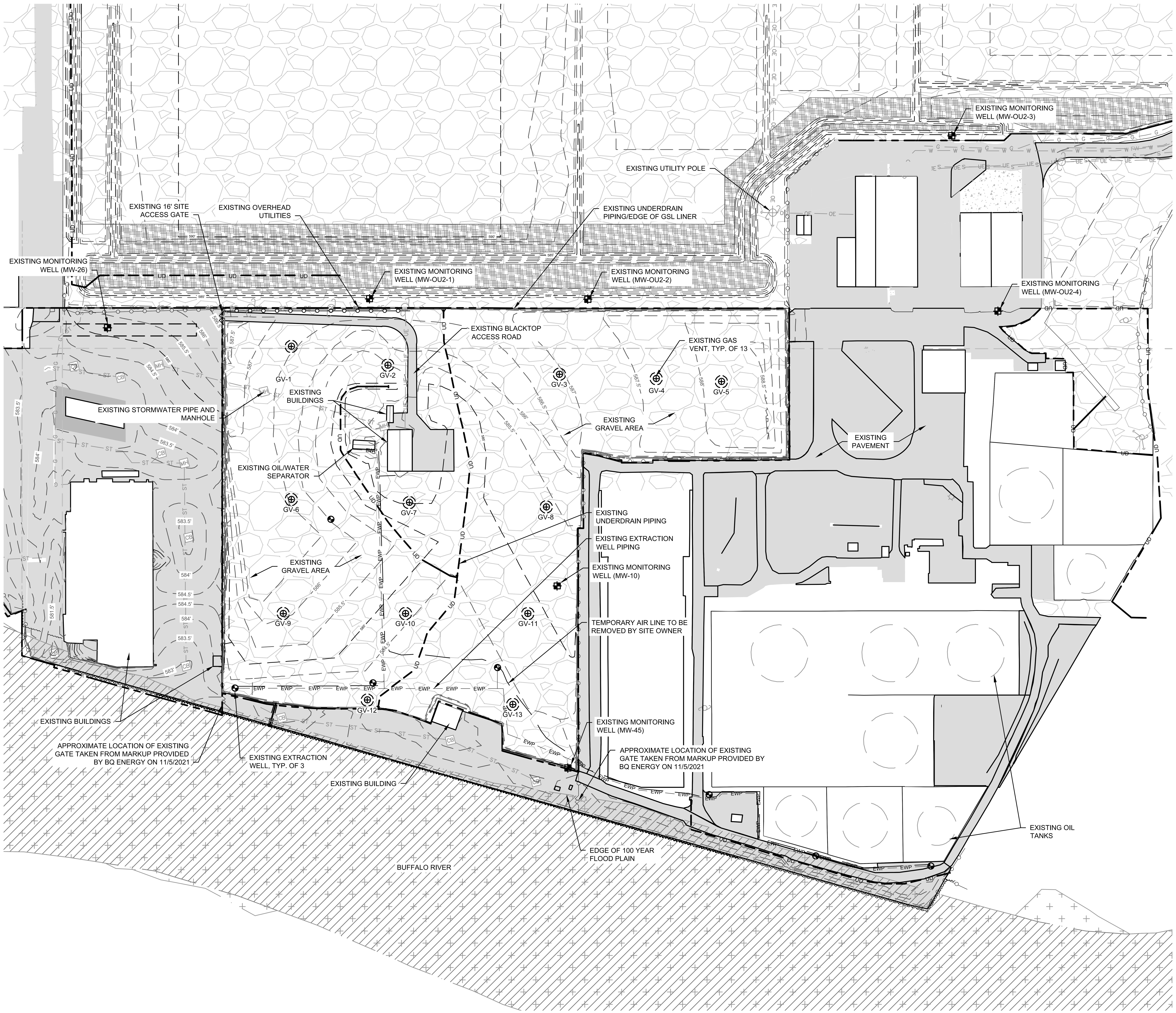
9/5/2023	DESIGNED BY: TSB, JAT	C&A JOB#	DRAWING:
SCALE	CHECKED BY: TSB, JSC	5566.03	T-0.3
AS SHOWN	APPROVED BY: JSC		



EXISTING CONDITIONS SITE MAP

SCALE: 1"= 80'

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

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LEGEND

- 586.5 — EXISTING CONTOUR .5' INTERVAL
- 585 — EXISTING CONTOUR 5' INTERVAL
- EXISTING LEASE LINE
- EXISTING/PROPOSED ROAD EDGE
- EXISTING/PROPOSED FENCE
- ST — EXISTING STORMWATER LINE
- G — EXISTING GAS LINE
- W — EXISTING WATER LINE
- FW — EXISTING FIRE WATER LINE
- S — EXISTING SEWER LINE
- OE — EXISTING OVERHEAD ELECTRIC
- UE — EXISTING UNDERGROUND ELECTRIC
- EWP — EXISTING EXTRACTION WELL PIPE
- EXISTING TEMPORARY AIR LINE
- UD — EXISTING UNDERDRAIN
- EXTENT OF GSL LINER/EXISTING UNDERDRAIN
- MH — EXISTING/PROPOSED STORMWATER MANHOLE
- CB — EXISTING/PROPOSED STORMWATER CATCH BASIN
- EXISTING BUILDING
- EXISTING PAVEMENT HATCH
- REGULATORY FLOODWAY
- EXISTING CRUSHED STONE CAP MATERIAL
- EXISTING STORMWATER BASIN
- 100-YEAR FLOODPLAIN
- EXISTING EXTRACTION WELL
- EXISTING MONITORING WELL
- EXISTING GAS VENT W/ 5' AND 10' OFFSET
- EXISTING/PROPOSED LIGHT POLE
- EXISTING/PROPOSED UTILITY POLE
- EXISTING/PROPOSED GUY WIRE
- APPROXIMATE EXISTING UTILITY EASEMENT

REV #	DESCRIPTION	DATE	BY
1	DRAWING NOTES UPDATES	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

EXISTING CONDITIONS SITE MAP

INOVATEUS SOLAR LLC
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South Bend, IN 46637

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3/22/2024

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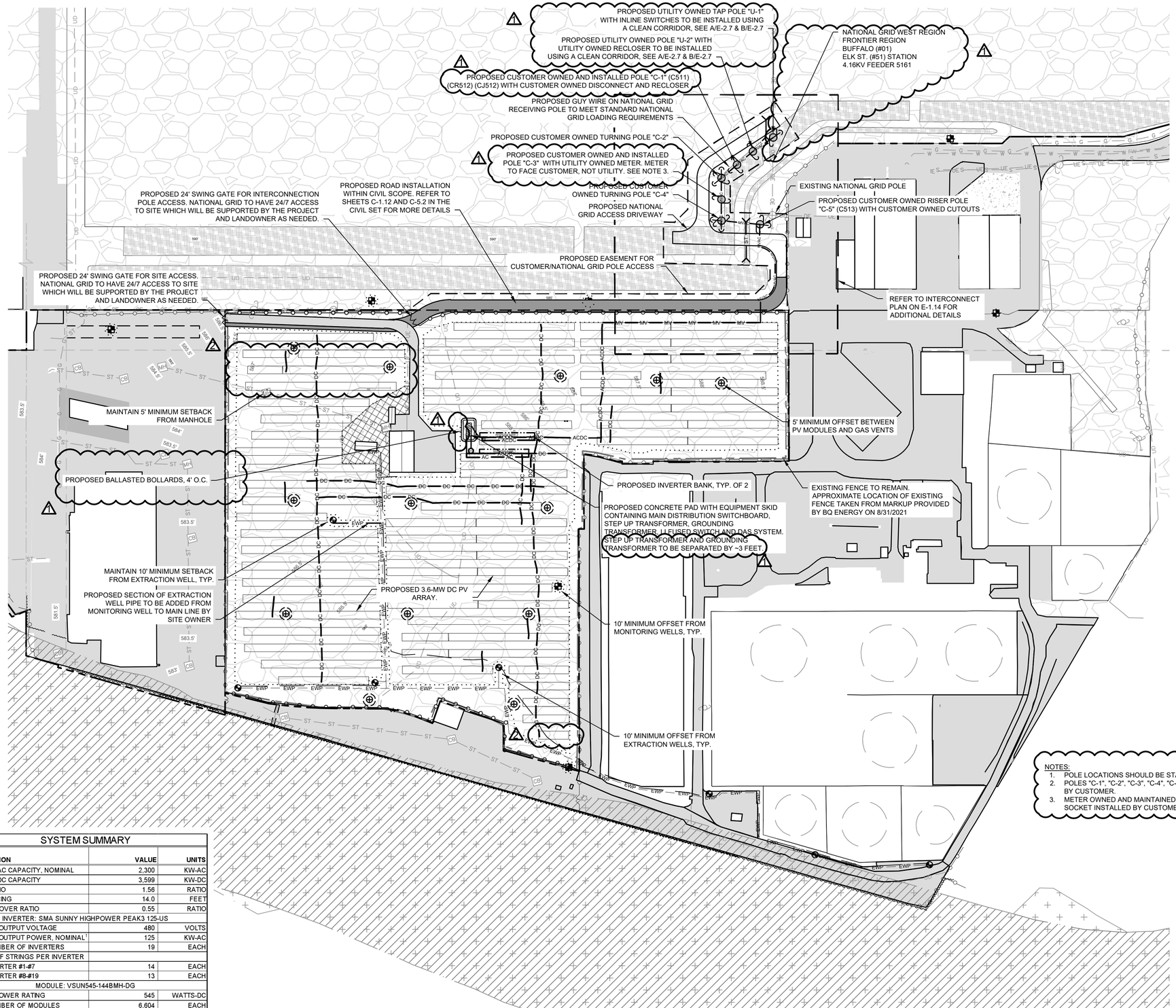

NOTES:
1. POLE LOCATIONS SHOULD BE STAKED IN FIELD BY A SURVEYOR.
2. POLES "C-1", "C-2", "C-3", "C-4", "C-5" TO BE OWNED AND INSTALLED BY CUSTOMER.
3. METER OWNED AND MAINTAINED BY NATIONAL GRID, METER SOCKET INSTALLED BY CUSTOMER.

DRAWING NOTES:

1. BACKGROUND DRAWING INCLUDING PROPERTY BOUNDARIES, EXISTING SITE FEATURES, TOPOGRAPHY AND FEMA 1% ANNUAL CHANCE FLOOD ZONE FROM REMEDIATION DESIGN CAD FILES BY AMEC E&E P.C., DATED DECEMBER 2019, PROVIDED BY BQ ENERGY ON FEBRUARY 8, 2021.
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LEGEND

- EXISTING LEASE LINE
- EXISTING/PROPOSED ROAD EDGE
- EXISTING/PROPOSED FENCE
- EXISTING STORMWATER LINE
- EXISTING GAS LINE
- EXISTING WATER LINE
- EXISTING FIRE WATER LINE
- EXISTING SEWER LINE
- EXISTING OVERHEAD/UNDERGROUND ELECTRIC
- EXISTING/OWNER ADDED EXTRACTION WELL PIPE
- EXISTING UNDERDRAIN
- EXTENT OF GSL LINER/EXISTING UNDERDRAIN
- EXISTING/PROPOSED STORMWATER MANHOLE
- EXISTING/PROPOSED STORMWATER CATCH BASIN
- EXISTING BUILDING
- EXISTING/PROPOSED PAVEMENT HATCH
- PV MODULE EXCLUSION AREA PER ESCP
- FEMA REGULATORY FLOODWAY
- EXISTING CRUSHED STONE CAP MATERIAL
- EXISTING STORMWATER BASIN
- FEMA 1% ANNUAL CHANCE FLOOD ZONE HATCH
- EXISTING EXTRACTION WELL
- EXISTING MONITORING WELL
- EXISTING GAS VENT W/ 5' AND 10' OFFSET, SEE NOTE 5.
- EXISTING/PROPOSED LIGHT POLE
- EXISTING/PROPOSED UTILITY POLE
- EXISTING/PROPOSED GUY WIRE
- APPROXIMATE EXISTING UTILITY EASEMENT
- PROPOSED MODULE SETBACK
- PROPOSED DC ELECTRIC
- PROPOSED LOW VOLTAGE AC ELECTRIC
- PROPOSED MEDIUM VOLTAGE AC ELECTRIC
- PROPOSED AC & DC ELECTRIC
- PROPOSED CONCRETE EQUIPMENT PAD
- PROPOSED NATIONAL GRID ACCESS AREA

SYSTEM SUMMARY

DESCRIPTION	VALUE	UNITS
MAXIMUM AC CAPACITY, NOMINAL	2,300	KW-AC
MAXIMUM DC CAPACITY	3,599	KW-DC
DC-AC RATIO	1.56	RATIO
ROW SPACING	14.0	FEET
GROUND COVER RATIO	0.55	RATIO
INVERTER: SMA SUNNY HIGHPOWER PEAK3 125-US		
INVERTER OUTPUT VOLTAGE	480	VOLTS
INVERTER OUTPUT POWER, NOMINAL[1]	125	KW-AC
TOTAL NUMBER OF INVERTERS	19	EACH
NUMBER OF STRINGS PER INVERTER		
INVERTER #1-#7	14	EACH
INVERTER #8-#19	13	EACH
MODULE: VSUN545-144BMH-DG		
MODULE POWER RATING	545	WATTS-DC
TOTAL NUMBER OF MODULES	6,604	EACH
MODULES PER RACK, VERTICALLY	2	PORTRAIT
MODULES PER STRING	26	EACH
MAX DC SYSTEM VOLTAGE	1,500	VOLTS
NUMBER OF STRINGS	254	EACH
TILT ANGLE	30	DEGREES
AZIMUTH ANGLE	14	DEGREES

[1] INVERTER #1-10 TO BE DERATED BY MANUFACTURER TO A NOMINAL OUTPUT POWER OF 121.1KW-AC. INVERTER #11-19 TO BE DERATED BY MANUFACTURER TO A NOMINAL OUTPUT POWER OF 121.0KW-AC.

PROPOSED ELECTRICAL SITE PLAN

SCALE: 1"= 80'

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

REV #	DESCRIPTION	DATE	BY
2	UPDATES PER NYSDEC COMMENTS	3/22/24	JAT
1	UPDATES PER NATIONAL GRID COMMENTS	3/5/24	ESA

ELK STREET SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

PROPOSED ELECTRICAL SITE PLAN

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

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ENGINEERING & LAND SURVEYING, PC
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www.crawfordandassociates.com fax: (518) 828-2723

LICENSED PROFESSIONAL ENGINEER — STATE OF NEW YORK — JENNIFER SUZANNE CROUCH — 100556

9/5/2024

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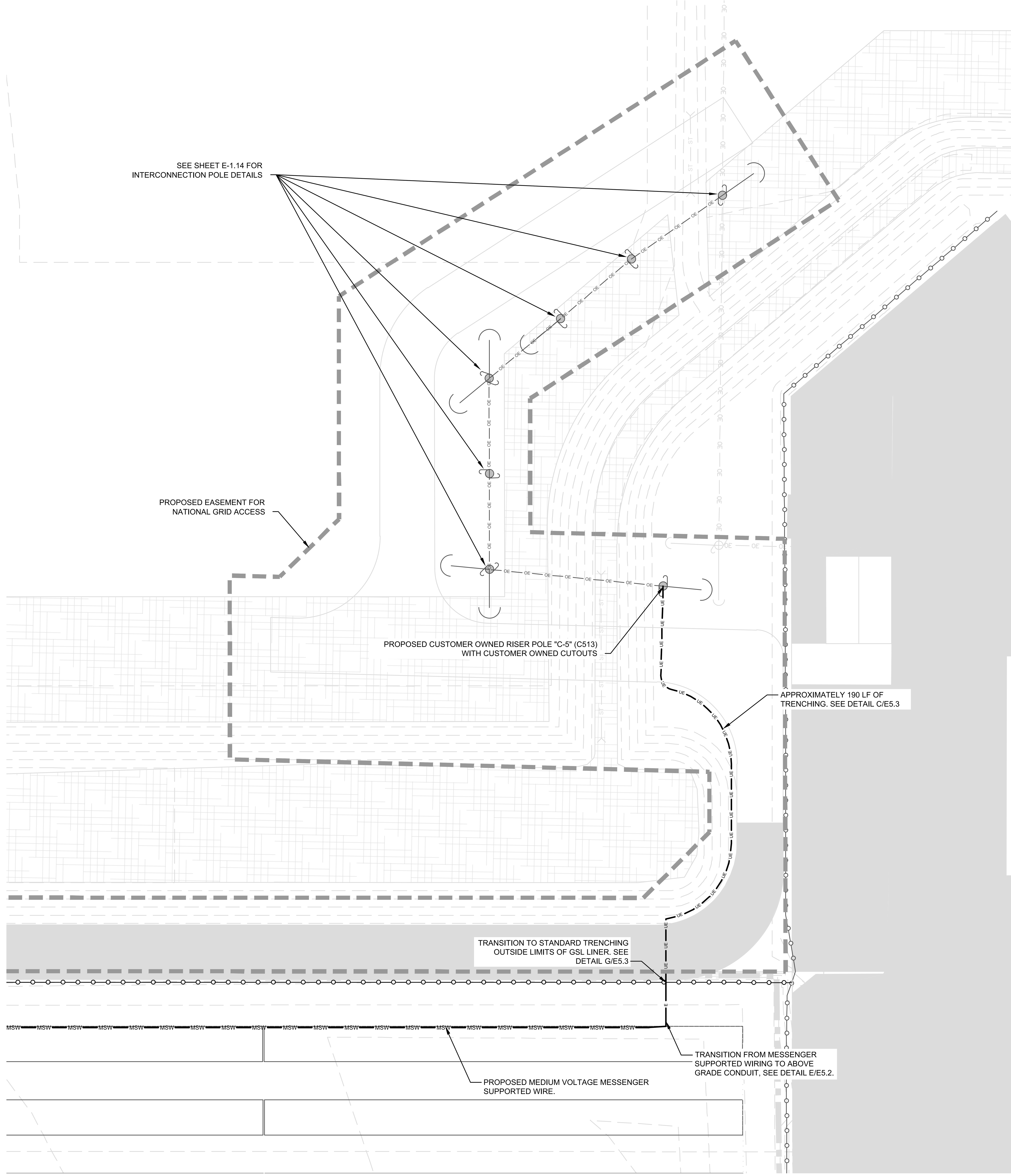
9/5/2023	DESIGNED BY: TSB, JAT	
SCALE	CHECKED BY: TSB, JSC	C&A JOB#
AS SHOWN	APPROVED BY: JSC	5566.03

DRAWING: E–1.1



TRENCHING PLAN

SCALE: 1"= 20'

DRAWING NOTES:

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LEGEND

Symbol	Description
—o—o—	EXISTING/PROPOSED FENCE
— UE — UE — UE —	PROPOSED SHALLOW TRENCHING
	EXTENT OF GEOMEMBRANE/EXISTING UNDERDRAIN
	EXISTING/PROPOSED UTILITY POLE
	EXISTING/PROPOSED GUY WIRE
··········	PROPOSED MODULE SETBACK
—MSW—MSW—MSW—	PROPOSED MESSENGER WIRE SUPPORTED WIRING
— E — E — E —	PROPOSED ABOVE GRADE CONDUIT

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

STATE OF NEW YORK · JENNIFER SUZANNE CRAWFORD · LICENSED PROFESSIONAL ENGINEER · 100566

3/22/2024

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REV #	DESCRIPTION	DATE	BY
1	DRAWING NOTES UPDATES	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

TRENCHING PLAN

INOVATEUS SOLAR LLC
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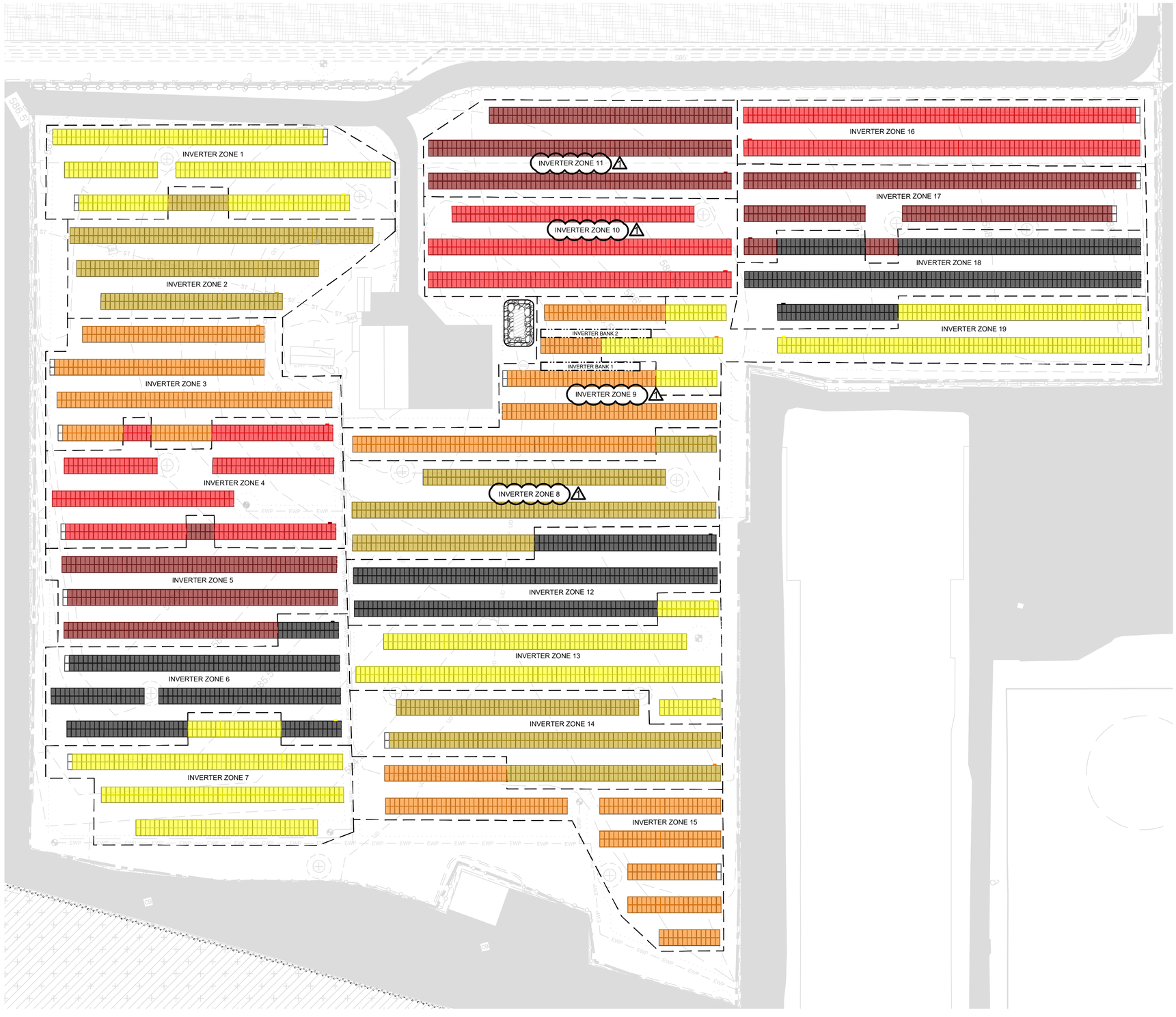

INVERTER ZONES
SCALE: 1"= 80'

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LEGEND

- INVERTER ZONE BOUNDARY
- INVERTER BANK X — INVERTER BANK LOCATION

GRAPHIC SCALE
80 0 40 80 160 320
(IN FEET)
1 inch = 80 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

REV #	DESCRIPTION	DATE	BY
1	INVERTER ZONES NUMBERING UPDATE	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT
CITY OF BUFFALO — ERIE COUNTY, NY

INVERTER ZONES

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JENNIFER SUZANNE GRANT — LICENSED PROFESSIONAL ENGINEER — 120556 — STATE OF NEW YORK
9/5/2024

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DATE	9/5/2023	
SCALE	AS SHOWN	
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DESIGNED BY:	TSB, JAT	
CHECKED BY:	TSB, JSC	
APPROVED BY:	JSC	
C&A JOB#	5566.03	
DRAWING:	E-1.3	

GROUNDING PLAN
SCALE: 1"= 80'

LEGEND

- GND — GND — PROPOSED EQUIPMENT GROUNDING CONDUCTOR (EGC) ROUTE
- GND-N — GND-N — PROPOSED GROUNDED CONDUCTOR (NEUTRAL) ROUTE
- PROPOSED GROUNDING ELECTRODE
- EXISTING/PROPOSED FENCE
- INVERTER BANK X — PROPOSED INVERTER BANK
- DCCB-X — PROPOSED DC COMBINER BOX

GROUNDING NOTES:
1. GROUNDING DIAGRAM IS SCHEMATIC. ACTUAL PHYSICAL LOCATIONS TO BE DETERMINED IN FIELD.
2. ALL METALLIC ENCLOSURES MUST BE BONDED TO THE GROUNDING ELECTRODE SYSTEM.
3. RACKING SYSTEM IS UL LISTED 2703.
4. ALL RACKING TO FOLLOW MANUFACTURER'S GROUNDING GUIDELINES, REFER TO INSTALLATION MANUAL.
5. BOND EVERY FENCE AND GATE POST TO BARBED WIRE AND MESH ON EITHER SIDE OF THE POST USING #6 SOLID COPPER EGC.
6. THE GROUNDING CONNECTION SHALL BE MADE TO THE GROUNDING SYSTEM OF THE ENCLOSURE EQUIPMENT.
7. SEE SHEET E-6.5 AND E-6.6 FOR CABLE AND CONDUIT SCHEDULES.
8. SEE SHEET E-1.2 FOR TRENCHING PLAN.
9. SEE SHEET E-5.1 FOR GROUNDING RING DETAIL.

DRAWING NOTES:
1. BACKGROUND DRAWING INCLUDING PROPERTY BOUNDARIES, EXISTING SITE FEATURES, TOPOGRAPHY AND FEMA 1% ANNUAL CHANCE FLOOD ZONE FROM REMEDIATION DESIGN CAD FILES BY AMEC E&E P.C., DATED DECEMBER 2019, PROVIDED BY BQ ENERGY ON FEBRUARY 8, 2021.
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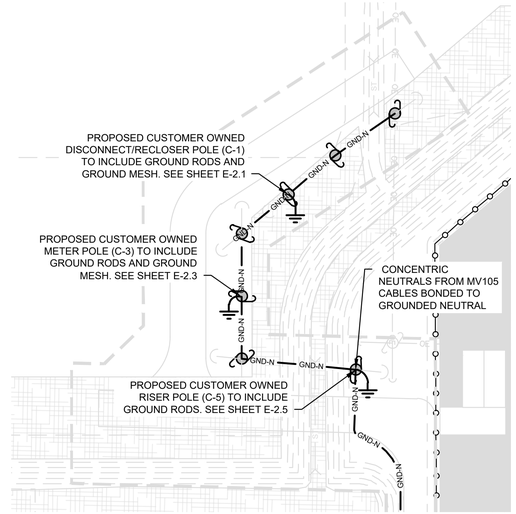

INSET A - POLE LINEUP GROUNDING
SCALE: 1"= 80'

GRAPHIC SCALE
80 0 40 80 160 320
(IN FEET)
1 inch = 80 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

REV #	DESCRIPTION	DATE	BY
1	UPDATED MSW ROUTE	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT
CITY OF BUFFALO — ERIE COUNTY, NY

GROUNDING PLAN

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

STATE OF NEW YORK — HOWARD SUZANNE CRAWFORD — 120556 — LICENSED PROFESSIONAL ENGINEER
3/22/2024

DATE	9/5/2023	DRAWN BY: TSB, JAT, ESA	N:\WORK\5566.02 Elk Street\DWG\5566.02 SITE - ELEC.dwg
SCALE	AS SHOWN	DESIGNED BY: TSB, JAT	
		CHECKED BY: TSB, JSC	
		APPROVED BY: JSC	
C&A JOB#	5566.03	DRAWING:	E-1.4

AC CABLE PLAN

SCALE: 1"= 40'

DRAWING NOTES:

1. BACKGROUND DRAWING INCLUDING PROPERTY BOUNDARIES, EXISTING SITE FEATURES, TOPOGRAPHY AND FEMA 1% ANNUAL CHANCE FLOOD ZONE FROM REMEDIATION DESIGN CAD FILES BY AMEC E&E P.C., DATED DECEMBER 2019, PROVIDED BY BQ ENERGY ON FEBRUARY 8, 2021.
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LEGEND

- MSW MSW MSW — PROPOSED MESSENGER SUPPORTED WIRING
- E E E — PROPOSED ABOVE GRADE CONDUIT
- CT CT CT — PROPOSED CABLE TRAY
- UE UE — PROPOSED UNDERGROUND ELECTRIC
- PROPOSED EQUIPMENT PAD

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)

1 inch = 40 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

REV #	DESCRIPTION	DATE	BY
1	DRAWING NOTES UPDATES	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

AC CABLE PLAN

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LICENSED PROFESSIONAL ENGINEER — JENNIFER SUZANNE CRAWFORD — STATE OF NEW YORK — 100556

9/5/2024

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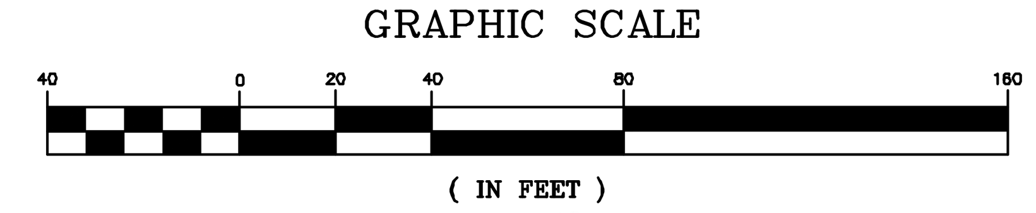
		CHECKED BY:	TSB, JSC
		APPROVED BY:	JSC
		N:\WORK\5566.02 Elk Street\DWG\5566.02 SITE - ELEC.dwg	
C&A JOB#	5566.03	DRAWING:	E-1.5

DC CABLE PLAN

SCALE: 1"= 40'



NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

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LEGEND

Symbol	Description
MSW—MSW—MSW	PROPOSED MESSENGER SUPPORTED WIRING
E—E—E	PROPOSED ABOVE GRADE CONDUIT
CT—CT—CT	PROPOSED CABLE TRAY
DCCB-X	PROPOSED DC COMBINER BOX
(hatched)	PROPOSED EQUIPMENT PAD

REV #	DESCRIPTION	DATE	BY
1	UPDATED MSW ROUTE	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

DC CABLE PLAN

INOVATEUS SOLAR LLC
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South Bend, IN 46637

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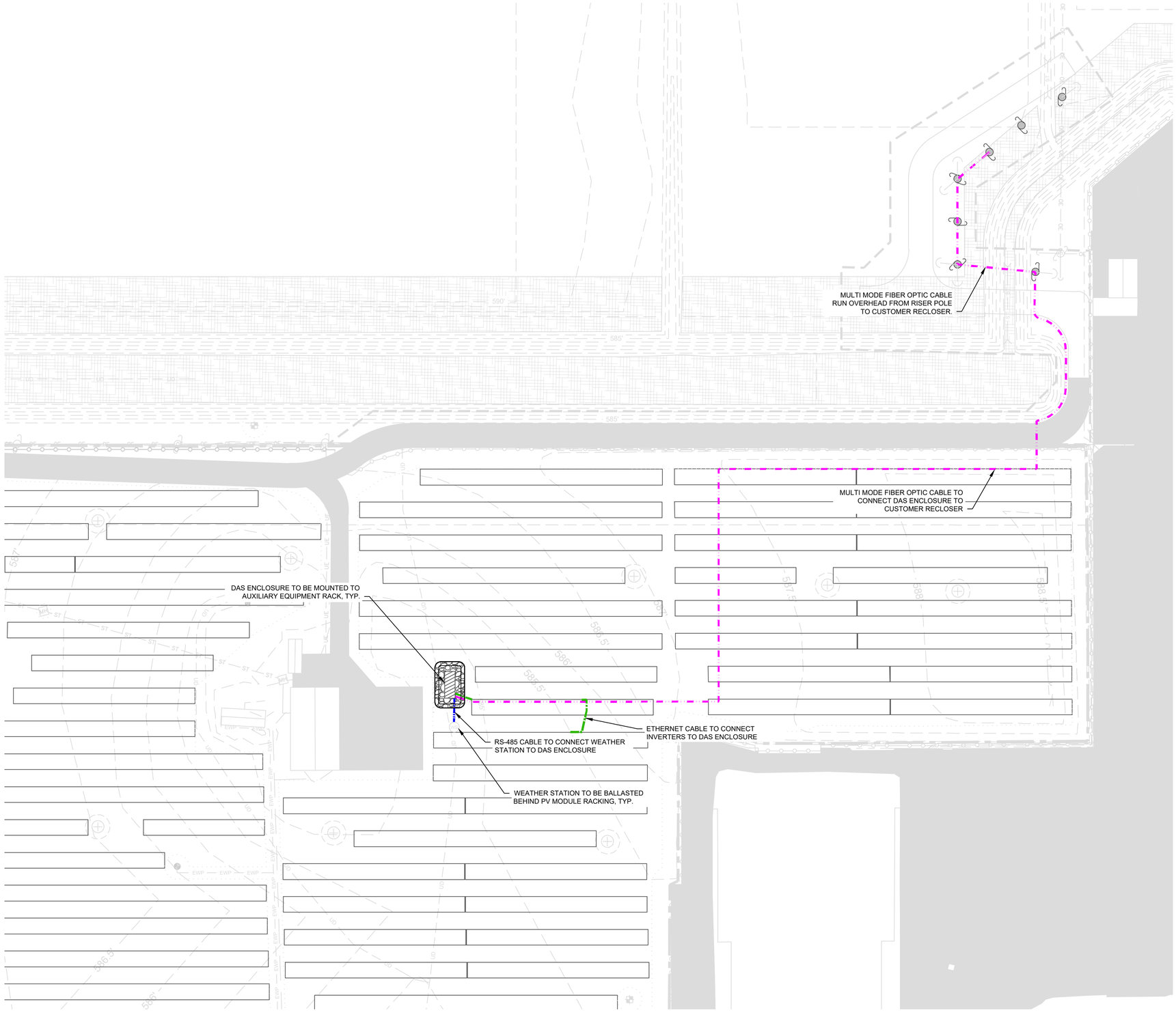
STATE OF NEW YORK — JENNIFER SUZANNE CRAWFORD — 100566 — LICENSED PROFESSIONAL ENGINEER
3/22/2024

DATE	DRAWN BY: TSB, JAT, ESA	H:\WORK\5566.02 Elk Street\DWG\5566.02 SITE – ELEC.dwg	
9/5/2023	DESIGNED BY: TSB, JAT	C&A JOB#	DRAWING:
SCALE	CHECKED BY: TSB, JSC	5566.03	E–1.6
AS SHOWN	APPROVED BY: JSC		



COMMUNICATION LAYOUT
SCALE: 1"= 40'

DRAWING NOTES:

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LEGEND

- ETHERNET CAT5E
- SERIAL / RS-485
- FIBER MULTI-MODE

COMMUNICATIONS NOTES:

1. CABLE LOCATIONS ARE DIAGRAMMATIC IN NATURE AND DO NOT REFLECT EXACT ROUTING OF CABLES, SEE ELECTRICAL PLAN SHEET E-1.2 FOR TRENCHING LOCATIONS.
2. CONTRACTOR TO PROVIDE CABLES AND CONNECTIONS BETWEEN DAS SYSTEM ENCLOSURES, SENSORS, AND SYSTEM EQUIPMENT.
3. WIRE TYPES AND SIZES TO BE PER ALSO ENERGY RECOMMENDATIONS.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

REV #	DESCRIPTION	DATE	BY
1	DRAWING NOTES UPDATES	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

COMMUNICATION LAYOUT

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

LICENSED PROFESSIONAL ENGINEER — JENNIFER SUZANNE CRAWFORD — STATE OF NEW YORK — 100556
9/5/2024

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		APPROVED BY:	JSC
C&A JOB#	5566.03	DRAWING:	E-1.7

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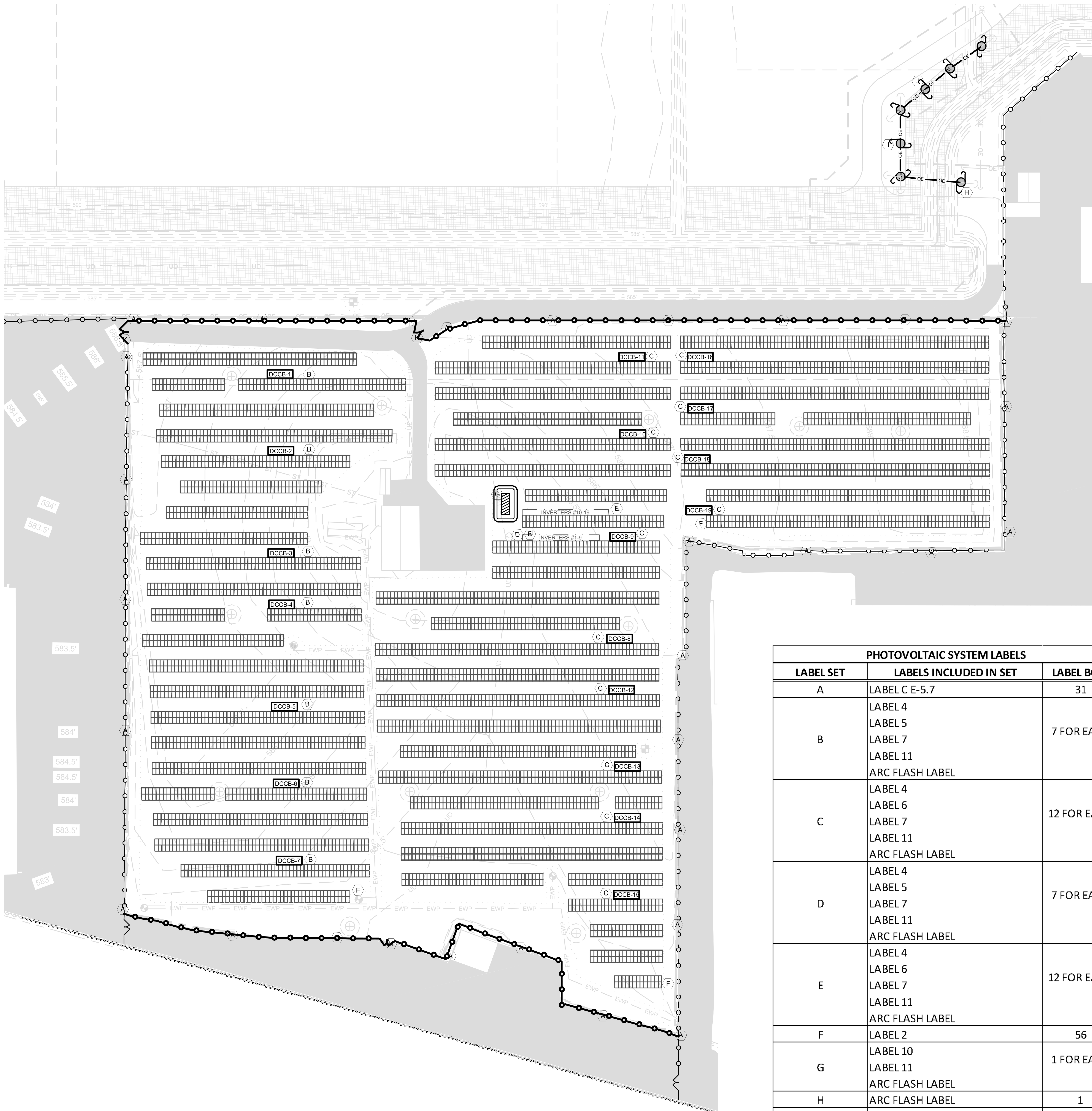

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LEGEND

EXISTING/PROPOSED FENCE

INVERTER BANK X — PROPOSED INVERTER BANK

X — LABEL SET

GENERAL NOTES:

1. SEE E-5.5, E-5.6 AND E-5.7 FOR SIGNAGE DETAILS.
2. END-OF-ROW LABEL SETS "F" ARE SHOWN IN TYPICAL LOCATION. THE INSTALLER IS TO MOUNT THEM AT THE END OF THE ROW ON THE SIDE OF THE RACKING.
3. LABELS AROUND FENCE ARE APPROXIMATE AND TO BE PLACED EVERY 100 FEET.

PHOTOVOLTAIC SYSTEM LABELS

LABEL SET	LABELS INCLUDED IN SET	LABEL BOM
A	LABEL C E-5.7	31
B	LABEL 4 LABEL 5 LABEL 7 LABEL 11 ARC FLASH LABEL	7 FOR EACH
C	LABEL 4 LABEL 6 LABEL 7 LABEL 11 ARC FLASH LABEL	12 FOR EACH
D	LABEL 4 LABEL 5 LABEL 7 LABEL 11 ARC FLASH LABEL	7 FOR EACH
E	LABEL 4 LABEL 6 LABEL 7 LABEL 11 ARC FLASH LABEL	12 FOR EACH
F	LABEL 2	56
G	LABEL 10 LABEL 11 ARC FLASH LABEL	1 FOR EACH
H	ARC FLASH LABEL	1
I	LABEL 8B	1 FOR EACH
J	LABEL 8 LABEL 9 LABEL 10 LABEL 11 LABEL E E-5.6	1 FOR EACH
K	LABEL C E-5.7 LABEL 10	3 FOR EACH

ARRAY MAPPING PLAN

SCALE: 1"= 60'

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

REV #	DESCRIPTION	DATE	BY
1	DRAWING NOTES UPDATES	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

ARRAY MAPPING PLAN

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
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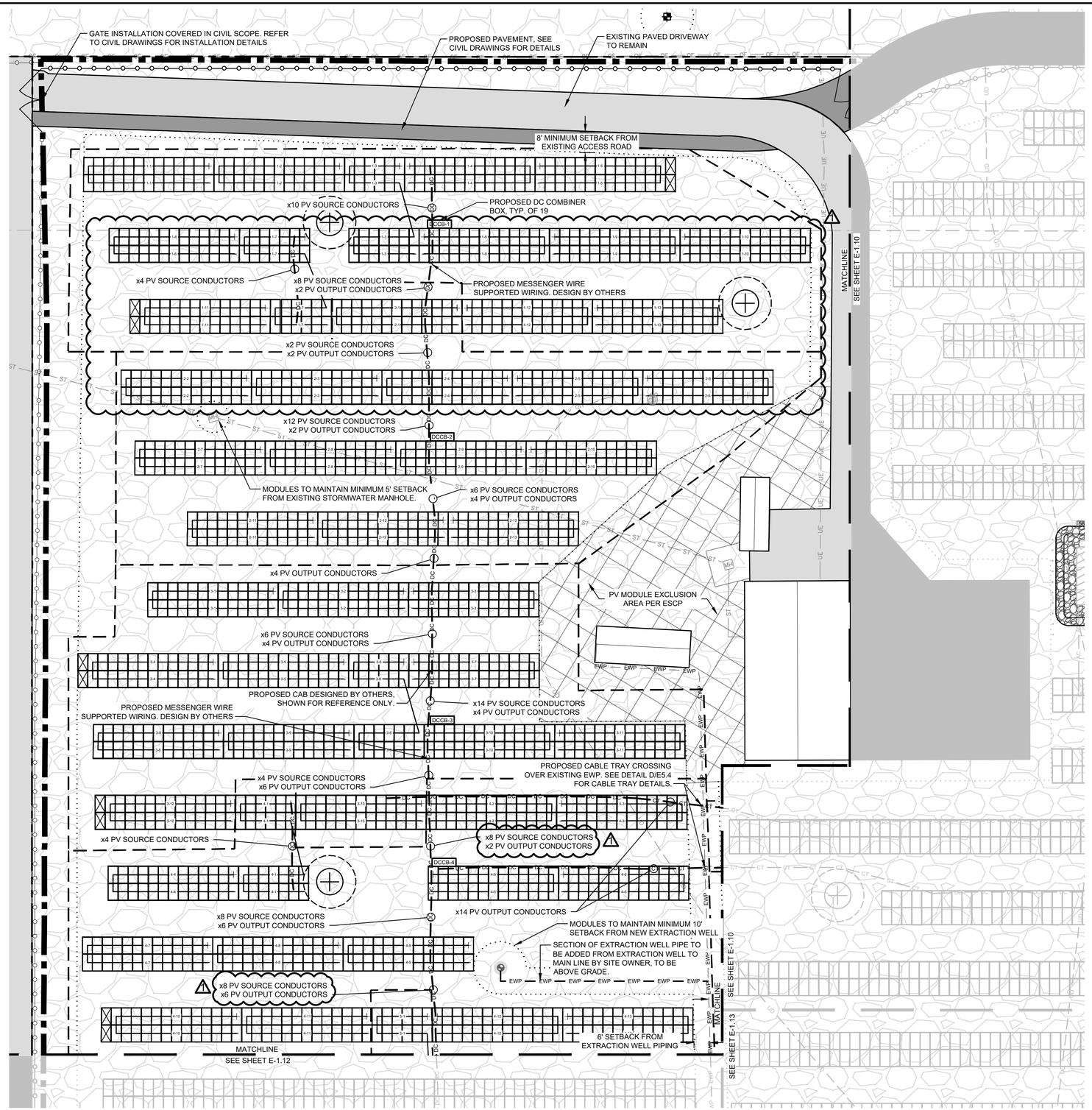
www.crawfordandassociates.com fax: (518) 828-2723

STATE OF NEW YORK — JENNIFER SUZANNE CRAWFORD — 100566 — LICENSED PROFESSIONAL ENGINEER — 3/22/2024

DATE: 9/5/2023
SCALE: AS SHOWN
DRAWN BY: TSB, JAT, ESA
DESIGNED BY: TSB, JAT
CHECKED BY: TSB, JSC
APPROVED BY: JSC
H:\WORK\5566.02 Elk Street\DWG\5566.02 SITE – ELEC.dwg
C&A JOB#: 5566.03
DRAWING: E–1.8



COMBINER BOX ZONES - AREA 1

SCALE: 1"= 20'

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

DRAWING NOTES:

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NOTES:

1. MSW FILLS BASED ON PRELIMINARY COORDINATION WITH TERRASMART. FILLS TO BE VERIFIED BY EOR PRIOR TO CONSTRUCTION

LEGEND

- EXISTING/PROPOSED FENCE
- UE — EXISTING UNDERGROUND ELECTRIC
- EWP — EXISTING EXTRACTION WELL PIPING
- EWP — EXTRACTION WELL PIPING TO BE COMPLETED BY OWNER
- UD — EXISTING UNDERDRAIN
- EXTENT OF GEOMEMBRANE/EXISTING UNDERDRAIN
- MH / MH — EXISTING/PROPOSED STORMWATER MANHOLE
- CB / CB — EXISTING/PROPOSED STORMWATER CATCH BASIN
- EXISTING EXTRACTION WELL
- EXISTING MONITORING WELL
- EXISTING GAS VENT W/ 5' AND 10' OFFSET
- EXISTING/PROPOSED UTILITY POLE
- EXISTING/PROPOSED GUY WIRE
- PROPOSED MODULE SETBACK
- DC — PROPOSED DC ELECTRIC
- AC — PROPOSED LV-AC ELECTRIC
- MV — PROPOSED MV-AC ELECTRIC
- ACDC — PROPOSED AC & DC ELECTRIC
- INVERTER ZONE BOUNDARY
- DCCB-X — PROPOSED DC COMBINER BOX
- INVERTER BANK X — PROPOSED INVERTER BANK
- PROPOSED EQUIPMENT PAD
- PV MODULE EXCLUSION AREA PER ESCP
- EXISTING/PROPOSED PAVEMENT HATCH
- WS — PROPOSED WEATHER STATION
- MODULE STRING

REV #	DESCRIPTION	DATE	BY
1	LAYOUT UPDATE	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

COMBINER BOX ZONES - AREA 1

INOVATEUS SOLAR LLC
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LICENSED PROFESSIONAL ENGINEER — STATE OF NEW YORK — JENNIFER SUZANNE CROCKETT — 120556

3/22/2024

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9/5/2023	DESIGNED BY: TSB, JAT	
SCALE	CHECKED BY: TSB, JSC	C&A JOB#
AS SHOWN	APPROVED BY: JSC	5566.03

DRAWING: E-1.9

COMBINER BOX ZONES - AREA 2

SCALE: 1"= 20'

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

1 inch = 20 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

DRAWING NOTES:

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- EXTRACTION WELL PIPING TO BE COMPLETED BY OWNER
- EXISTING UNDERDRAIN
- EXTENT OF GEOMEMBRANE/EXISTING UNDERDRAIN
- EXISTING/PROPOSED STORMWATER MANHOLE
- EXISTING/PROPOSED STORMWATER CATCH BASIN
- EXISTING EXTRACTION WELL
- EXISTING MONITORING WELL
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- PV MODULE EXCLUSION AREA PER ESCP
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- WS — PROPOSED WEATHER STATION
- MODULE STRING

REV #	DESCRIPTION	DATE	BY
1	LABELS AND STRINGING UPDATES	3/22/24	JAT

ELK STREET SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

COMBINER BOX ZONES - AREA 2

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STATE OF NEW YORK — JENNIFER SUZANNE CROUCH — 150556 — LICENSED PROFESSIONAL ENGINEER

9/5/2024

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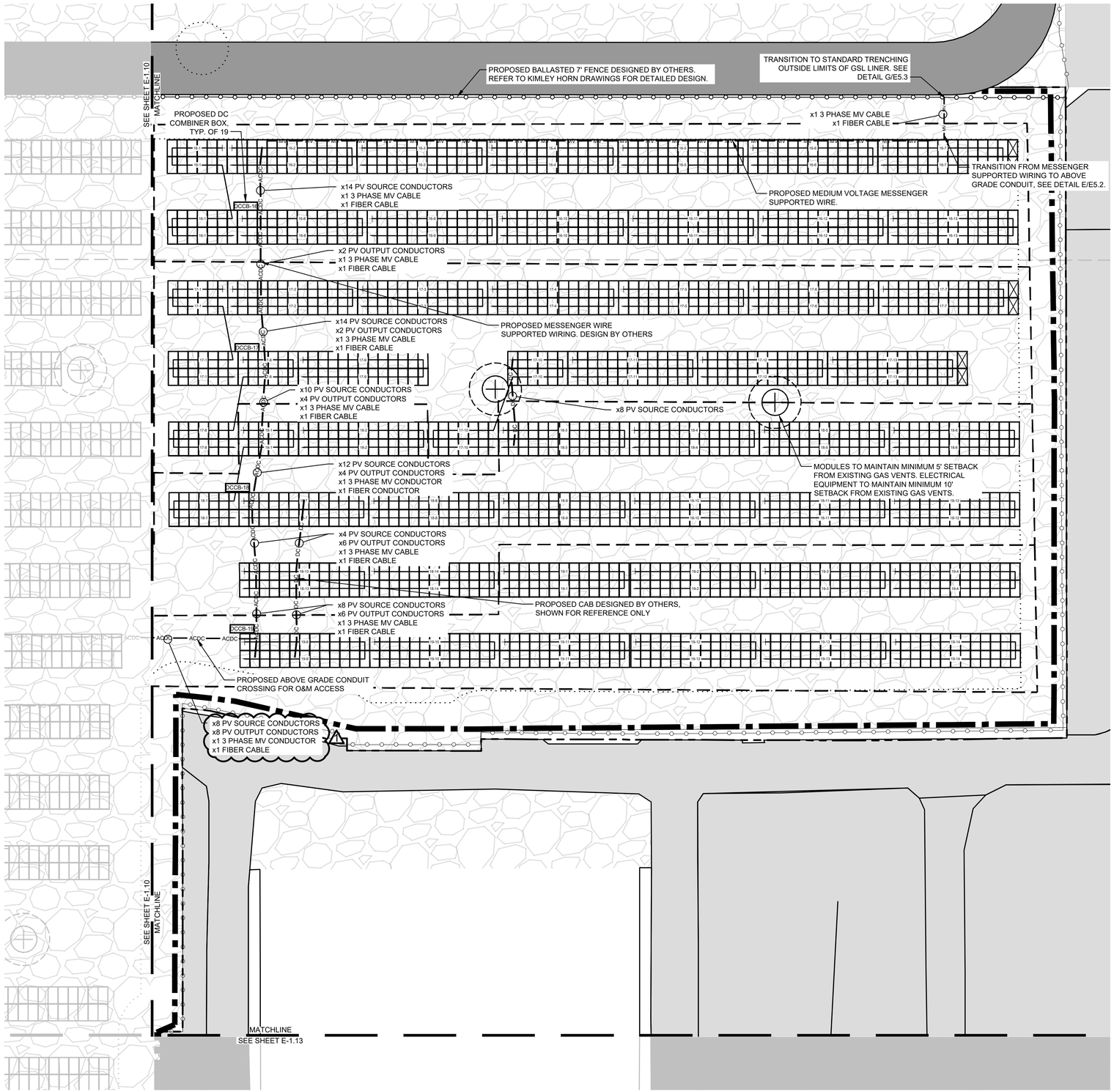
DATE	DRAWN BY: TSB, JAT, ESA	N:\WORK\5566.02 Elk Street\DWG\5566.02 SITE - ELEC.dwg
9/5/2023	DESIGNED BY: TSB, JAT	
SCALE	CHECKED BY: TSB, JSC	C&A JOB# 5566.03
AS SHOWN	APPROVED BY: JSC	DRAWING: E-1.10



COMBINER BOX ZONES - AREA 3

SCALE: 1"= 20'

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F

DRAWING NOTES:

1. BACKGROUND DRAWING INCLUDING PROPERTY BOUNDARIES, EXISTING SITE FEATURES, TOPOGRAPHY AND FEMA 1% ANNUAL CHANCE FLOOD ZONE FROM REMEDIATION DESIGN CAD FILES BY AMEC E&E P.C., DATED DECEMBER 2019, PROVIDED BY BQ ENERGY ON FEBRUARY 8, 2021.
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4. 10 FOOT OFFSET FROM GAS VENTS FOR COMBINER BOXES, INVERTERS AND JUNCTIONS OTHER THAN PV SOURCE STRINGS. 5 FOOT OFFSETS FROM GAS VENTS FOR MODULES.
5. UTILITY EQUIPMENT IS FOR INFORMATION PURPOSES ONLY, NOT FOR CONSTRUCTION, AND MAY BE CHANGED BY THE UTILITY AT ANY TIME IN THE FUTURE.

NOTES:

1. MSW FILLS BASED ON PRELIMINARY COORDINATION WITH TERRASMART. FILLS TO BE VERIFIED BY EOR PRIOR TO CONSTRUCTION

LEGEND

- EXISTING/PROPOSED FENCE
- UE — EXISTING UNDERGROUND ELECTRIC
- EWP — EXISTING EXTRACTION WELL PIPING
- EWP — EXTRACTION WELL PIPING TO BE COMPLETED BY OWNER
- UD — EXISTING UNDERDRAIN
- EXTENT OF GEOMEMBRANE/EXISTING UNDERDRAIN
- MH / MK — EXISTING/PROPOSED STORMWATER MANHOLE
- CB / CB — EXISTING/PROPOSED STORMWATER CATCH BASIN
- EXISTING EXTRACTION WELL
- EXISTING MONITORING WELL
- EXISTING GAS VENT W/ 5' AND 10' OFFSET
- EXISTING/PROPOSED UTILITY POLE
- EXISTING/PROPOSED GUY WIRE
- PROPOSED MODULE SETBACK
- DC — PROPOSED DC ELECTRIC
- AC — PROPOSED LV-AC ELECTRIC
- MV — PROPOSED MV-AC ELECTRIC
- ACDC — PROPOSED AC & DC ELECTRIC
- INVERTER ZONE BOUNDARY
- DCCB-X — PROPOSED DC COMBINER BOX
- INVERTER BANK X — PROPOSED INVERTER BANK
- PROPOSED EQUIPMENT PAD
- PV MODULE EXCLUSION AREA PER ESCP
- EXISTING/PROPOSED PAVEMENT HATCH
- WS — PROPOSED WEATHER STATION
- X X — MODULE STRING

REV #	DESCRIPTION	DATE	BY
1	LABEL UPDATES	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

COMBINER BOX ZONES - AREA 3

INOVATEUS SOLAR LLC
15890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

STATE OF NEW YORK — JENNIFER SUZANNE CRAWFORD — 110556 — LICENSED PROFESSIONAL ENGINEER

SIGNATURE 3/22/2024

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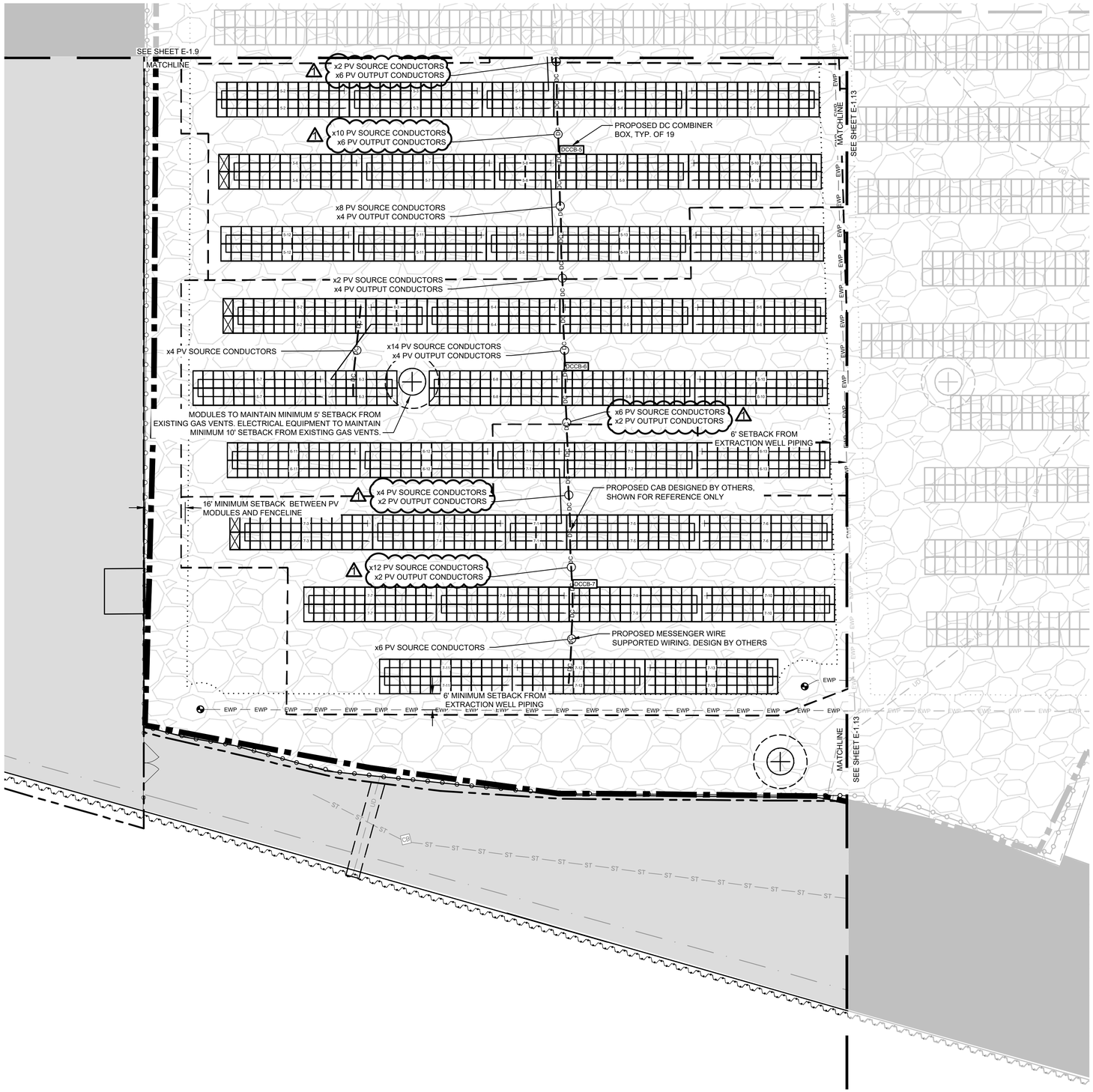
SCALE	AS SHOWN	DESIGNED BY: TSB, JAT	C&A JOB# 5566.03
		CHECKED BY: TSB, JSC	DRAWING: E-1.11
		APPROVED BY: JSC	



COMBINER BOX ZONES - AREA 4

SCALE: 1"= 20'

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

1 inch = 20 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

DRAWING NOTES:

1. BACKGROUND DRAWING INCLUDING PROPERTY BOUNDARIES, EXISTING SITE FEATURES, TOPOGRAPHY AND FEMA 1% ANNUAL CHANCE FLOOD ZONE FROM REMEDIATION DESIGN CAD FILES BY AMEC E&E P.C., DATED DECEMBER 2019, PROVIDED BY BQ ENERGY ON FEBRUARY 8, 2021.
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NOTES:
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LEGEND

- EXISTING/PROPOSED FENCE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING EXTRACTION WELL PIPING
- EXTRACTION WELL PIPING TO BE COMPLETED BY OWNER
- EXISTING UNDERDRAIN
- EXTENT OF GEOMEMBRANE/EXISTING UNDERDRAIN
- EXISTING/PROPOSED STORMWATER MANHOLE
- EXISTING/PROPOSED STORMWATER CATCH BASIN
- EXISTING EXTRACTION WELL
- EXISTING MONITORING WELL
- EXISTING GAS VENT W/ 5' AND 10' OFFSET
- EXISTING/PROPOSED UTILITY POLE
- EXISTING/PROPOSED GUY WIRE
- PROPOSED MODULE SETBACK
- PROPOSED DC ELECTRIC
- PROPOSED LV-AC ELECTRIC
- PROPOSED MV-AC ELECTRIC
- PROPOSED AC & DC ELECTRIC
- INVERTER ZONE BOUNDARY
- PROPOSED DC COMBINER BOX
- PROPOSED INVERTER BANK
- PROPOSED EQUIPMENT PAD
- PV MODULE EXCLUSION AREA PER ESCP
- EXISTING/PROPOSED PAVEMENT HATCH
- PROPOSED WEATHER STATION
- MODULE STRING

REV #	DESCRIPTION	DATE	BY
1	LABEL UPDATES	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

COMBINER BOX ZONES - AREA 4

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

LICENSED TEMPLER SUZANNE CRAWFORD PROFESSIONAL ENGINEER 140556 STATE OF NEW YORK
3/22/2024

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SCALE	AS SHOWN	DESIGNED BY: TSB, JAT	
		CHECKED BY: TSB, JSC	
		APPROVED BY: JSC	

C&A JOB# 5566.03

DRAWING: E-1.12

COMBINER BOX ZONES - AREA 5
SCALE: 1"= 20'

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

DRAWING NOTES:

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- EXTRACTION WELL PIPING TO BE COMPLETED BY OWNER
- EXISTING UNDERDRAIN
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- EXISTING/PROPOSED STORMWATER MANHOLE
- EXISTING/PROPOSED STORMWATER CATCH BASIN
- EXISTING EXTRACTION WELL
- EXISTING MONITORING WELL
- EXISTING GAS VENT W/ 5' AND 10' OFFSET
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- EXISTING/PROPOSED GUY WIRE
- PROPOSED MODULE SETBACK
- PROPOSED DC ELECTRIC
- PROPOSED LV-AC ELECTRIC
- PROPOSED MV-AC ELECTRIC
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- DCCB-X PROPOSED DC COMBINER BOX
- INVERTER BANK X PROPOSED INVERTER BANK
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- PV MODULE EXCLUSION AREA PER ESCP
- EXISTING/PROPOSED PAVEMENT HATCH
- WS PROPOSED WEATHER STATION
- MODULE STRING

REV #	DESCRIPTION	DATE	BY
1	LAYOUT AND LABEL UPDATES	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT
CITY OF BUFFALO — ERIE COUNTY, NY

COMBINER BOX ZONES - AREA 5

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
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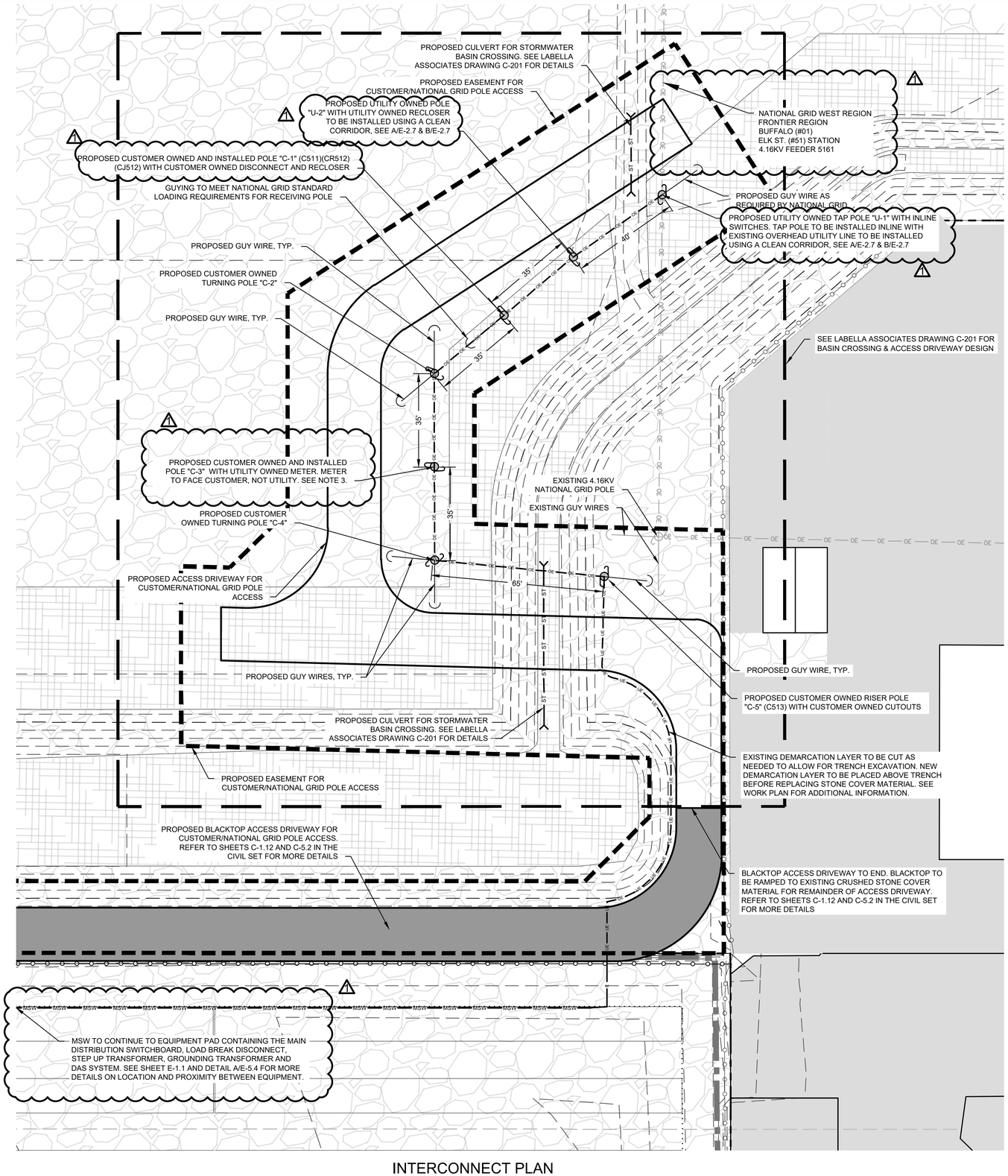
www.crawfordandassociates.com fax: (518) 828-2723

STATE OF NEW YORK ★ JENNIFER SUZANNE CRAWFORD ★ LICENSED PROFESSIONAL ENGINEER 100566
3/22/2024

DATE 9/5/2023	DRAWN BY: TSB, JAT, ESA	H:\WORK\5566.02 Elk Street\DWG\5566.02 SITE - ELEC.dwg	
	DESIGNED BY: TSB, JAT	C&A JOB# 5566.03	DRAWING: E-1.13
SCALE AS SHOWN	CHECKED BY: TSB, JSC		
	APPROVED BY: JSC		



INTERCONNECT PLAN

SCALE: 1"= 20'

DRAWING NOTES:

1. BACKGROUND DRAWING INCLUDING PROPERTY BOUNDARIES, EXISTING SITE FEATURES, TOPOGRAPHY AND FEMA 1% ANNUAL CHANCE FLOOD ZONE FROM REMEDIATION DESIGN CAD FILES BY AMEC E&E P.C., DATED DECEMBER 2019, PROVIDED BY BQ ENERGY ON FEBRUARY 8, 2021.
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NOTES:

1. POLE LOCATIONS SHOULD BE STAKED IN FIELD BY A SURVEYOR.
2. POLES "C-1", "C-2", "C-3", "C-4", "C-5" TO BE OWNED AND INSTALLED BY CUSTOMER.
3. METER OWNED AND MAINTAINED BY NATIONAL GRID, METER SOCKET INSTALLED BY CUSTOMER.

LEGEND

- EXISTING CONTOUR .5' INTERVAL (586.5)
- EXISTING CONTOUR 5' INTERVAL (585)
- EXISTING/PROPOSED FENCE
- EXISTING/PROPOSED DRIVEWAY
- EXISTING/PROPOSED OVERHEAD ELECTRIC (OE)
- EXISTING UNDERGROUND ELECTRIC (UE)
- PROPOSED SHALLOW TRENCHING (UE)
- EXISTING/PROPOSED EXTRACTION WELL PIPING (EWP)
- PROPOSED ABOVE GRADE CONDUIT (E)
- EXISTING/PROPOSED UTILITY POLE
- EXISTING/PROPOSED GUY WIRE
- EXTENT OF GSL LINER/EXISTING UNDERDRAIN
- EXISTING BUILDING
- EXISTING PAVEMENT HATCH
- PROPOSED PAVEMENT HATCH
- EXISTING CRUSHED STONE CAP MATERIAL
- EXISTING STORMWATER BASIN
- PROPOSED UTILITY EASEMENT

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

REV #	DESCRIPTION	DATE	BY
2	DRAWING NOTES UPDATES	3/22/24	JAT
1	UPDATES PER NATIONAL GRID COMMENTS	3/5/24	ESA

ELK STREET SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

INTERCONNECT PLAN

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

JENNIFER SUZANNE JOHNSTON — LICENSED PROFESSIONAL ENGINEER — 100586 — STATE OF NEW YORK
3/22/2024

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SCALE	AS SHOWN	DESIGNED BY: TSB, JAT	C&A JOB# 5566.03
		CHECKED BY: TSB, JSC	DRAWING: E-1.14
		APPROVED BY: JSC	

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LEGEND

- MSW MSW MSW — PROPOSED MESSENGER SUPPORTED WIRING
- E E E — PROPOSED ABOVE GRADE CONDUIT
- CT CT CT — PROPOSED CABLE TRAY
- PROPOSED EQUIPMENT PAD

EQUIPMENT PAD NOTES:

1. ALL ITEMS, INCLUDING CABLE ROUTING, SUBJECT TO CHANGE PENDING RECEIPT OF SKID LAYOUT DESIGN.

PROPOSED CONCRETE PAD WITH EQUIPMENT SKID CONTAINING MAIN DISTRIBUTION SWITCHBOARD, STEP UP TRANSFORMER, GROUNDING TRANSFORMER, LI FUSED SWITCH AND DAS SYSTEM

PROPOSED ABOVE GRADE CONDUIT CROSSING FOR MEDIUM VOLTAGE OUTPUT FROM LI FUSED SWITCH TO RISER POLE.

PROPOSED ABOVE GRADE CONDUIT CROSSING FOR INVERTERS #10-19 OUTPUT TO SWITCHBOARD.

INVERTERS #10-19

PROPOSED ABOVE GRADE CONDUIT CROSSING FOR INVERTERS #1-9 OUTPUT TO SWITCHBOARD.

INVERTERS #1-9

14'

586.5'

586'

585.5'

EQUIPMENT PAD LAYOUT PLAN

SCALE: 1"= 10'

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)

1 inch = 10 ft.

NAD83 NY-WEST
TRUE NORTH TO BE V.I.F.

REV #	DESCRIPTION	DATE	BY
1	DRAWING NOTES UPDATES	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

EQUIPMENT PAD
LAYOUT PLAN

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
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4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
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STATE OF NEW YORK · JENNIFER SUZANNE CROUCH · LICENSED PROFESSIONAL ENGINEER · 150555

3/22/2024

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DATE	9/5/2023
SCALE	AS SHOWN
DRAWN BY:	TSB, JAT, ESA
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CHECKED BY:	TSB, JSC
APPROVED BY:	JSC
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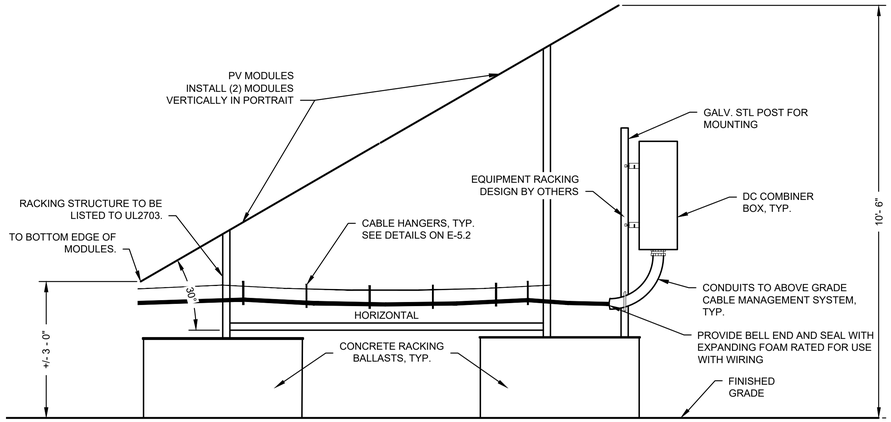
C&A JOB#	5566.03
DRAWING:	E-1.15

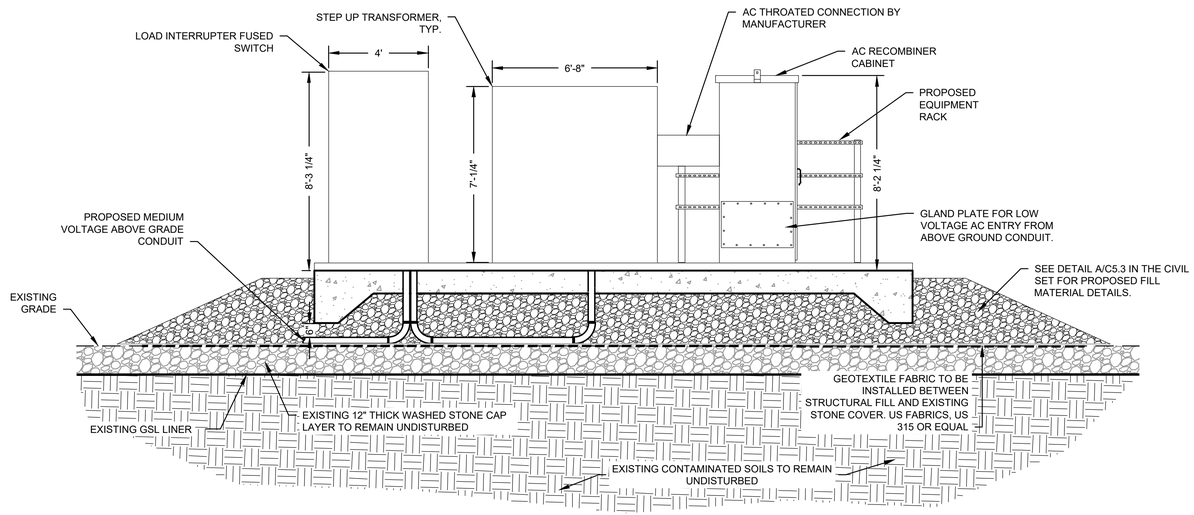


A E2.0 EQUIPMENT MOUNTING DETAIL

NTS

NOTES:

1. DRAWING DOES NOT REFLECT ACTUAL HEIGHT OR DEPTH OF THE RACKING FOUNDATIONS. REFER TO RACKING MANUFACTURER INSTALLATION MANUAL
2. EQUIPMENT SHALL BE MOUNTED SUCH THAT IT DOES NOT CAUSE ANY SHADING OF PV MODULES.
3. RACKING STRUCTURE IS REPRESENTATIVE ONLY
4. REFER TO SCHEDULE FOR CONDUIT SIZES
5. CONDUITS SHALL BE ROUTED SUCH THAT ARRAY FOUNDATIONS ARE AVOIDED.
6. ENCLOSURE SHALL BE MOUNTED SUCH THAT ALL CODE REQUIRED CLEARANCES ARE MET. (REFER TO NEC ARTICLE 110.32)
7. REFER TO RACKING MANUFACTURER MANUAL FOR MORE INFORMATION.
8. EQUIPMENT RACKING DESIGN BY OTHERS

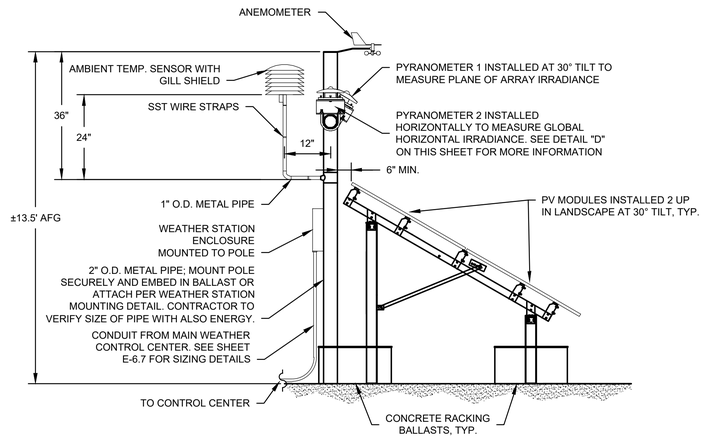


B E2.0 EQUIPMENT PAD ELEVATION VIEW

SCALE: N.T.S.

NOTES:

1. EQUIPMENT LAYOUT IS DIAGRAMMATIC IN NATURE, DETAILED LAYOUT IN E-1.14. LAYOUT SUBJECT TO CHANGE BASED ON SKID DESIGN.
2. SEE DETAIL 1 ON SHEET S500 FROM KIMLEY-HORN STRUCTURAL DRAWINGS FOR DETAILED DESIGN.
3. SEE SHEET E-5.1 FOR GROUNDING RING DETAILS

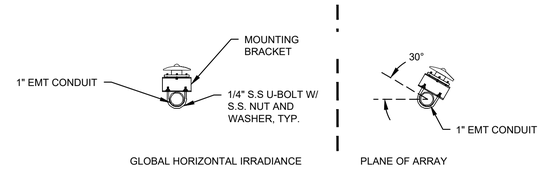


C E2.0 TYPICAL WEATHER STATION SECTION VIEW

SCALE: N.T.S.

NOTES:

1. EQUIPMENT RACKING DESIGN BY OTHERS



D E2.0 PYRANOMETER EAST ELEVATION

SCALE: N.T.S.

REV #	DESCRIPTION	DATE	BY

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

EQUIPMENT
ELEVATIONS

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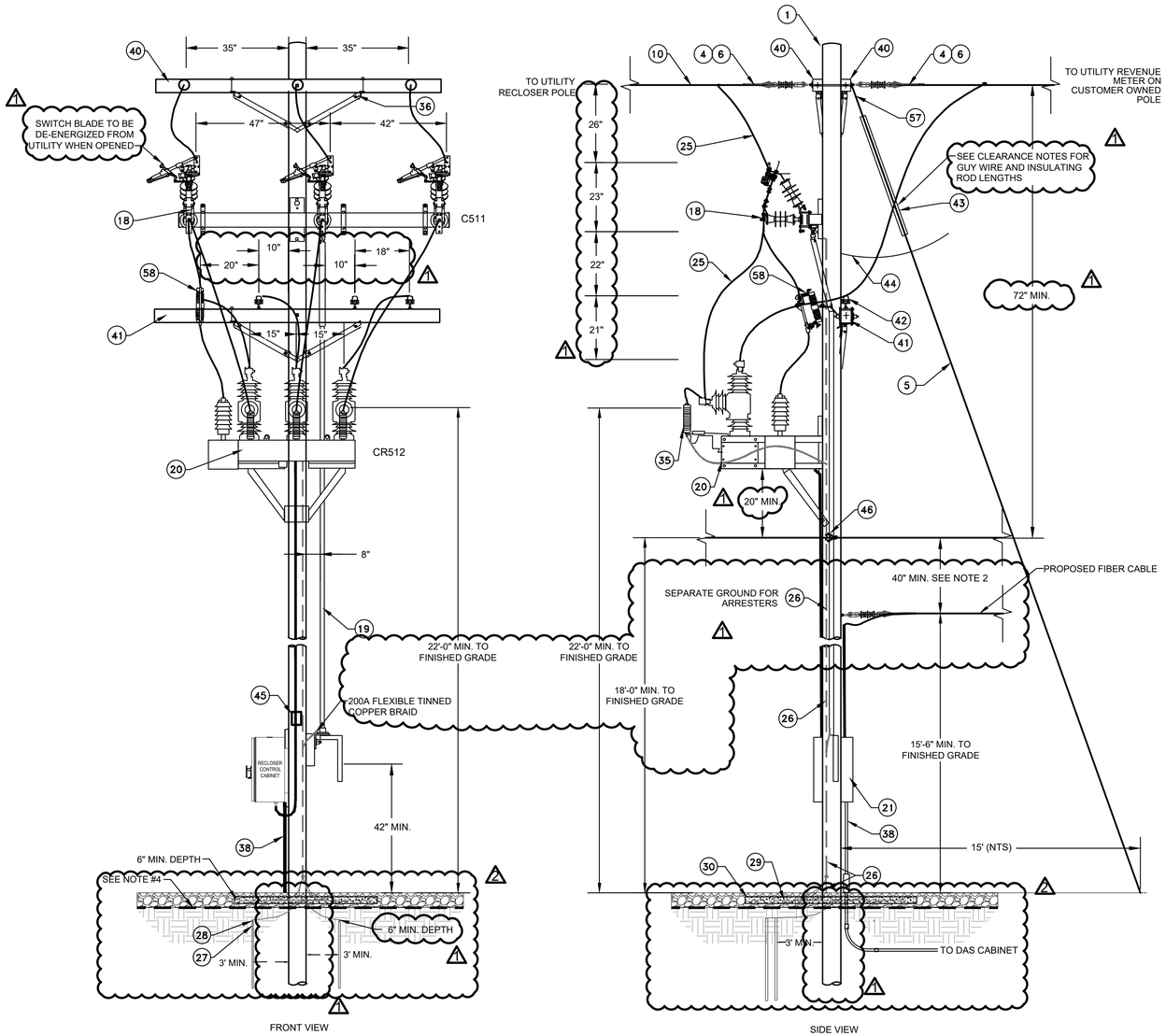
LICENSED PROFESSIONAL ENGINEER — STATE OF NEW YORK — JENNIFER SUZANNE CRAWFORD — 100556

9/5/2024

DATE	DRAWN BY: TSB	N:\WORK\5566.02 Elk Street\DWG\5566.02 DETAILS.dwg	
9/5/2023	DESIGNED BY: TSB		
SCALE	CHECKED BY: JSC	C&A JOB#	DRAWING:
AS SHOWN	APPROVED BY: JSC	5566.03	E-2.0

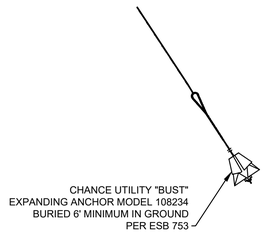


A / E2.1 CUSTOMER OWNED DISCONNECT/RECLOSER POLE (C-1)

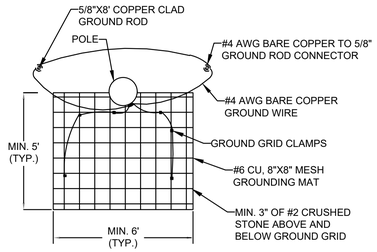
SCALE: N.T.S.

NOTES:

1. POLE DRAWINGS TAKEN FROM UTILITY COORDINATION DRAWING TITLED "INTERCONNECT POLE#1 DISCONNECT / RECLOSER", REVISION NUMBER 1, DATED 10/17/2022 BY IEM ENGINEERING.
2. CONTRACTOR TO PROVIDE AS-BUILT DISTANCES FOR USE IN RECORD DRAWINGS.
3. CUSTOMER TO OWN AND INSTALL POLE.
4. EXISTING DEMARCATION LAYER TO BE CUT AS NEEDED TO ALLOW FOR POLE INSTALLATION. NEW DEMARCATION LAYER TO BE PLACED AROUND POLE DURING BACKFILL PRIOR TO REPLACING STONE COVER MATERIAL. SEE WORK PLAN FOR ADDITIONAL INFORMATION.



GUY ANCHOR DETAIL



GROUND GRID DETAIL

CLEARANCE NOTES:

1. GUY WIRES SHALL BE 25 FT. MINIMUM LEAD WITH INSULATOR.
2. GUY WIRES SHALL UTILIZE AN INSULATING ROD THAT IS MINIMUM 54" LONG, BUT LONGER IF THERE IS THE POTENTIAL TO COME INTO CONTACT WITH ENERGIZED EQUIPMENT UPON FAILURE OF THE GUY WIRE ANCHOR.
3. THE SECTION OF THE GUY WIRE BELOW THE INSULATING ROD SHALL BE BONDED TO NEUTRAL.
4. CLEARANCE FROM THE INSULATING ROD TO THE PRIMARY CONDUCTOR SHALL BE A MINIMUM OF 6" FOR DOWN GUYS, OR 11" MINIMUM FOR SPAN GUYS.
5. ANCHOR SHALL BE BURIED 6 FT. IN GROUND MINIMUM.

SCHEDULE OF POLE EQUIPMENT

NO.	DESCRIPTION
1	40' SOUTHERN YELLOW PINE CLASS 2 POLE
2	CORRUGATED METAL PIPE - 4' DIAMETER
4	INSULATOR SUSPENSION TYPE 5 KV
5	7/16" HIGH STRENGTH GALV STEEL GUY WIRE
6	STRAIGHT STRAIN DEAD END CLAMP
8	RIGID CONDUIT RISER WITH END FITTING, 5" UNLESS OTHERWISE INDICATED
9	1/C TERMINATION, 15 KV
10	PRIMARY CONDUCTOR
18	SIEMENS SWITCH, 25KV, 150KV BIL, 900A VERTICAL MOUNT
19	SIEMENS SWITCH CONTROL ROD
20	G&W RECLOSER, 15KV WITH 400:1 CTS, VOLTAGE SENSING (X6), EXTERNAL CPT
21	SEL-651R RECLOSER CONTROLLER
24	POTHEAD BRACKET - ALUMA-FORM TB-EMB-13PA
25	SOLID COPPER CONDUCTOR
26	#4 SOLID COPPER
27	5/8" x 8' GROUND ROD
28	GROUND ROD CLAMP
29	8" X 8" COPPER GROUND MESH (5' x 6' GRID)
30	#2 CRUSHED STONE, 6" MIN. DEPTH
35	LIGHTNING ARRESTOR - EATON HEAVY DUTY, 3KV, 2.55MCOV
36	METAL CROSSARM BRACE - 26"
37	3CT / 3PT METER CLUSTER - (BY NATIONAL GRID)
38	1.5" RIGID CONDUIT, LENGTH AS REQD. FOR SECONDARY METERING AND RECLOSER
39	15KV, 600A SINGLE PHASE DISCONNECT
40	DOUBLE 8' WOOD CROSSARM (8' L x 4.25" H x 3.25" W)
41	SINGLE 8' WOOD CROSSARM (8' L x 4.25" H x 3.25" W)
42	STANDOFF INSULATOR, 5KV
43	FIBERGLASS GUY STRAIN INSULATOR, 60" MINIMUM
44	BONDING JUMPER TO GUY WIRE
45	LABEL INDICATING SWITCH DESIGNATION
46	SECONDARY CLEVIS WITH SPOOL INSULATOR
51	1/2" EXTRA HIGH STRENGTH, 7 STRAND GALV. STEEL GUY WIRE
52	1/2" UTILITY GRADE DEAD END FORMED WIRE
53	YELLOW GUY MARKER, 96" LONG
54	EXTRA HIGH STRENGTH STEEL, ALUMOWELD, STRANDVICE (RANGE 0.455"-0.520")
55	CHANCE SS5 SCREW ANCHOR EXTENSIONS (AS REQUIRED)
56	CHANCE SS5 SCREW ANCHOR, 8"-10"-12" HELIX COMBO W/ TWINEYE PULLING EYE OR APPROVED EQUAL (CHANCE CAT #012642AEJ)
57	SINGLE DOWN GUY ASSEMBLY - HEAVY DUTY (THROUGH BOLT)
58	0.5A FUSED CUTOUT

GENERAL NOTES:

1. UTILITY POLES ARE SHOWN AS CONCEPTUAL AND ARE FOR DIAGRAMMATIC PURPOSES ONLY. SCHEDULE ABOVE LISTS THE MAJOR ITEMS OF EQUIPMENT ONLY. ALL OTHER EQUIPMENT NECESSARY FOR PURPOSE INDICATED SHALL BE PROVIDED UNDER THIS CONTRACT.
2. ALL EQUIPMENT AND MATERIALS SHALL BE LISTED FOR THE PURPOSE AND INSTALLED IN ACCORDANCE WITH THE CURRENT VERSION OF THE NATIONAL ELECTRICAL CODE AND NATIONAL ELECTRIC SAFETY CODE.
3. RECLOSER SHALL BE EQUIPPED WITH THREE (3) 400:1 CURRENT TRANSFORMERS AND SIX(6) LOW ENERGY VOLTAGE SENSING DEVICES ON LINE/UTILITY SIDE. CPT TO BE MOUNTED TO RECLOSER FRAME BY VENDOR.
4. RECLOSER CONTROLLER SHALL BE PROVIDED BY RECLOSER MANUFACTURER AND BE EQUIPPED WITH LOW ENERGY ANALOG INPUTS. ALL NECESSARY CABLING SHALL BE PROVIDED BY RECLOSER MANUFACTURER TO PROVIDE A COMPLETE AND OPERABLE SYSTEM.
5. CONTRACTOR SHALL LEAVE ADEQUATE CONDUCTOR LENGTH PER PHASE FOR UTILITY CONNECTION.
6. CONTRACTOR SHALL INSTALL AND MAKE ALL ELECTRICAL AND COMMUNICATION CONNECTIONS AS SHOWN ON THESE CONTRACT DOCUMENTS.
7. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND IN ACCORDANCE WITH THE CURRENT VERSION OF THE NEC AND ALL LOCAL APPLICABLE CODES AND STANDARDS.
8. THE SWITCH OPERATING HANDLE SHALL BE GROUNDED AND CONNECTED TO A GROUND EQUIPOTENTIAL MAT AT THE BASE OF THE POLE. HANDLE TO BE MOUNTED BETWEEN 3' AND 4' TO GROUND
9. ALL CLEARANCES TO MEET NESC AND NATIONAL GRID 753 SPECIFICATIONS

ESB 753 CLEARANCES (RECOMMENDED / MINIMUM):

BETWEEN LIVE PARTS: 12" / 7"
LIVE PARTS TO GROUND: 8" / 6" (1)
LIVE PARTS TO VEHICULAR TRAFFIC: 22" (N/A)

POLE BURIAL DEPTH

POLE	DEPTH
40'	6'-0"
45'	6'-6"
50'	7'-0"
55'	7'-6"

REV #	DESCRIPTION	DATE	BY
2	UPDATES PER DEC COMMENTS	3/22/24	JAT
1	UPDATES PER NATIONAL GRID COMMENTS	3/5/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

UTILITY POLE ELEVATIONS - SHEET 1

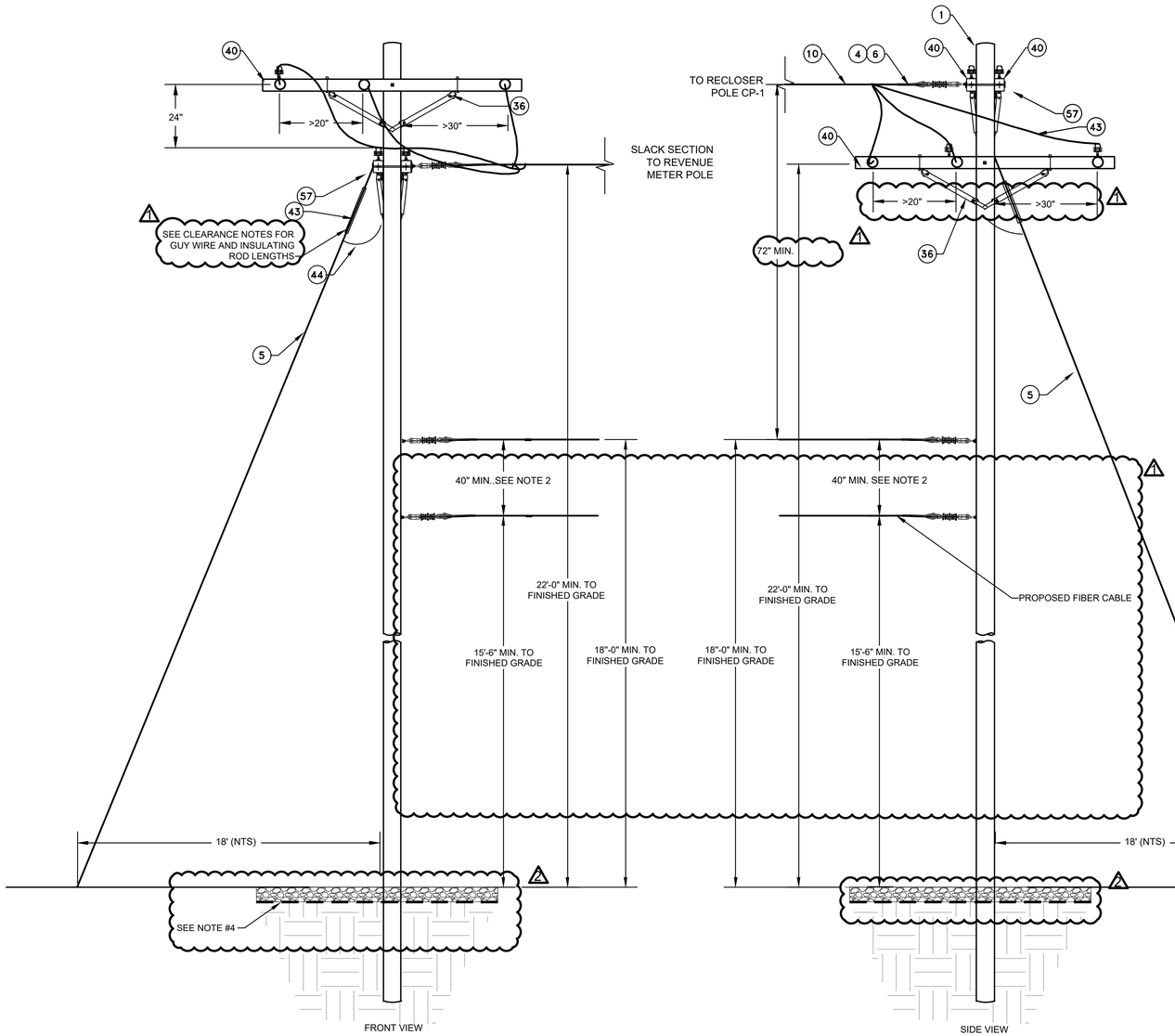
INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

STATE OF NEW YORK — JENNIFER SUZANNE CRAWFORD — 150556 — LICENSED PROFESSIONAL ENGINEER

3/22/2024

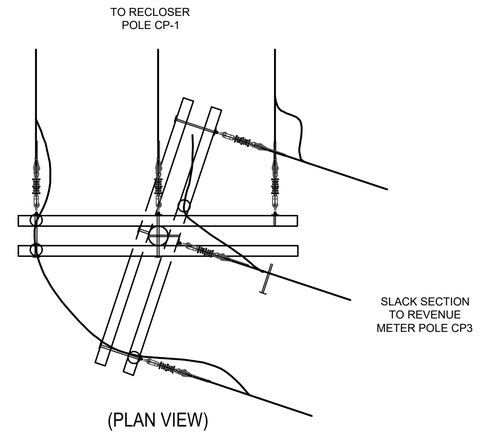
DATE	DRAWN BY: JAT	N:\WORK\5566.02 Elk Street\DWG\5566.02 DETAILS.dwg
9/5/2023	DESIGNED BY: JAT	C&A JOB#: 5566.03
SCALE: AS SHOWN	CHECKED BY: JSC	DRAWING: E-2.1
	APPROVED BY: JSC	



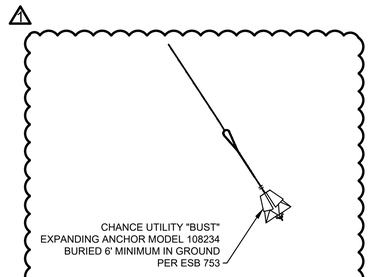
A
E2.2 CUSTOMER TURNING POLE (C-2)

SCALE: N.T.S.

NOTES:
1. POLE DRAWINGS TAKEN FROM UTILITY COORDINATION DRAWING TITLED "INTERCONNECT CP#2 TURNING POLE", REVISION NUMBER 1, DATED 10/17/2022 BY JEM ENGINEERING.
2. CONTRACTOR TO PROVIDE AS-BUILT DISTANCES FOR USE IN RECORD DRAWINGS.
3. CUSTOMER TO OWN AND INSTALL POLE.
4. EXISTING DEMARCATION LAYER TO BE CUT AS NEEDED TO ALLOW FOR POLE INSTALLATION. NEW DEMARCATION LAYER TO BE PLACED AROUND POLE DURING BACKFILL PRIOR TO REPLACING STONE COVER MATERIAL. SEE WORK PLAN FOR ADDITIONAL INFORMATION.



(PLAN VIEW)



GUY ANCHOR DETAIL

CLEARANCE NOTES:
1. GUY WIRES SHALL BE 25 FT. MINIMUM LEAD WITH INSULATOR.
2. GUY WIRES SHALL UTILIZE AN INSULATING ROD THAT IS MINIMUM 54" LONG, BUT LONGER IF THERE IS THE POTENTIAL TO COME INTO CONTACT WITH ENERGIZED EQUIPMENT UPON FAILURE OF THE GUY WIRE ANCHOR.
3. THE SECTION OF THE GUY WIRE BELOW THE INSULATING ROD SHALL BE BONDED TO NEUTRAL.
4. CLEARANCE FROM THE INSULATING ROD TO THE PRIMARY CONDUCTOR SHALL BE A MINIMUM OF 6" FOR DOWN GUYS, OR 11" MINIMUM FOR SPAN GUYS.
5. ANCHOR SHALL BE BURIED 6 FT. IN GROUND MINIMUM.

SCHEDULE OF POLE EQUIPMENT

NO.	DESCRIPTION
1	40' SOUTHERN YELLOW PINE CLASS 2 POLE
2	CORRUGATED METAL PIPE - 4' DIAMETER
4	INSULATOR SUSPENSION TYPE 5 KV
5	7/16" HIGH STRENGTH GALV STEEL GUY WIRE
6	STRAIGHT STRAIN DEAD END CLAMP
8	RIGID CONDUIT RISER WITH END FITTING, 5" UNLESS OTHERWISE INDICATED
9	1/C TERMINATION, 15 KV
10	PRIMARY CONDUCTOR
18	SIEMENS SWITCH, 25KV, 150KV BIL, 900A VERTICAL MOUNT
19	SIEMENS SWITCH CONTROL ROD
20	G&W RECLOSER, 15KV WITH 400:1 CTS, VOLTAGE SENSING (X6), EXTERNAL CPT
21	SEL-651R RECLOSER CONTROLLER
24	POTHEAD BRACKET - ALUMA-FORM TB-EMB-13PA
25	SOLID COPPER CONDUCTOR
26	#4 SOLID COPPER
27	5/8" x 8' GROUND ROD
28	GROUND ROD CLAMP
29	8" X 8" COPPER GROUND MESH (5' x 6' GRID)
30	#2 CRUSHED STONE, 6" MIN. DEPTH
35	LIGHTNING ARRESTOR - EATON HEAVY DUTY, 3KV, 2.55MCOV
36	METAL CROSSARM BRACE - 26"
37	3CT / 3PT METER CLUSTER - (BY NATIONAL GRID)
38	1.5" RIGID CONDUIT, LENGTH AS REQD. FOR SECONDARY METERING AND RECLOSER
39	15KV, 600A SINGLE PHASE DISCONNECT
40	DOUBLE 8' WOOD CROSSARM (8' L x 4.25" H x 3.25" W)
41	SINGLE 8' WOOD CROSSARM (8' L x 4.25" H x 3.25" W)
42	STANDOFF INSULATOR, 5KV
43	FIBERGLASS GUY STRAIN INSULATOR, 60" MINIMUM
44	BONDING JUMPER TO GUY WIRE
45	LABEL INDICATING SWITCH DESIGNATION
46	SECONDARY CLEVIS WITH SPOOL INSULATOR
51	1/2" EXTRA HIGH STRENGTH, 7 STRAND GALV. STEEL GUY WIRE
52	1/2" UTILITY GRADE DEAD END FORMED WIRE
53	YELLOW GUY MARKER, 96" LONG
54	EXTRA HIGH STRENGTH STEEL, ALUMOWELD, STRANDVICE (RANGE 0.455"-0.520")
55	CHANCE SS5 SCREW ANCHOR EXTENSIONS (AS REQUIRED)
56	CHANCE SS5 SCREW ANCHOR, 8"-10"-12" HELIX COMBO W/ TWINEYE PULLING EYE OR APPROVED EQUAL (CHANCE CAT #012642AEJ)
57	SINGLE DOWN GUY ASSEMBLY - HEAVY DUTY (THROUGH BOLT)
58	0.5A FUSED CUTOUT

GENERAL NOTES:

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3. RECLOSER SHALL BE EQUIPPED WITH THREE (3) 400:1 CURRENT TRANSFORMERS AND SIX(6) LOW ENERGY VOLTAGE SENSING DEVICES ON LINE/UTILITY SIDE. CPT TO BE MOUNTED TO RECLOSER FRAME BY VENDOR.
4. RECLOSER CONTROLLER SHALL BE PROVIDED BY RECLOSER MANUFACTURER AND BE EQUIPPED WITH LOW ENERGY ANALOG INPUTS. ALL NECESSARY CABLING SHALL BE PROVIDED BY RECLOSER MANUFACTURER TO PROVIDE A COMPLETE AND OPERABLE SYSTEM.
5. CONTRACTOR SHALL LEAVE ADEQUATE CONDUCTOR LENGTH PER PHASE FOR UTILITY CONNECTION.
6. CONTRACTOR SHALL INSTALL AND MAKE ALL ELECTRICAL AND COMMUNICATION CONNECTIONS AS SHOWN ON THESE CONTRACT DOCUMENTS.
7. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND IN ACCORDANCE WITH THE CURRENT VERSION OF THE NEC AND ALL LOCAL APPLICABLE CODES AND STANDARDS.
8. THE SWITCH OPERATING HANDLE SHALL BE GROUNDED AND CONNECTED TO A GROUND EQUIPOTENTIAL MAT AT THE BASE OF THE POLE. HANDLE TO BE MOUNTED BETWEEN 3' AND 4' TO GROUND
9. ALL CLEARANCES TO MEET NESC AND NATIONAL GRID 753 SPECIFICATIONS

ESB 753 CLEARANCES (RECOMMENDED / MINIMUM):
BETWEEN LIVE PARTS: 12" / 7"
LIVE PARTS TO GROUND: 8" / 6" 1
LIVE PARTS TO VEHICULAR TRAFFIC: 22" (N/A)

POLE BURIAL DEPTH

POLE	DEPTH
40'	6'-0"
45'	6'-6"
50'	7'-0"
55'	7'-6"

REV #	DESCRIPTION	DATE	BY
2	UPDATES PER DEC COMMENTS	3/22/24	JAT
1	UPDATES PER NATIONAL GRID COMMENTS	3/5/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

UTILITY POLE ELEVATIONS - SHEET 2

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
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www.crawfordandassociates.com fax: (518) 828-2723

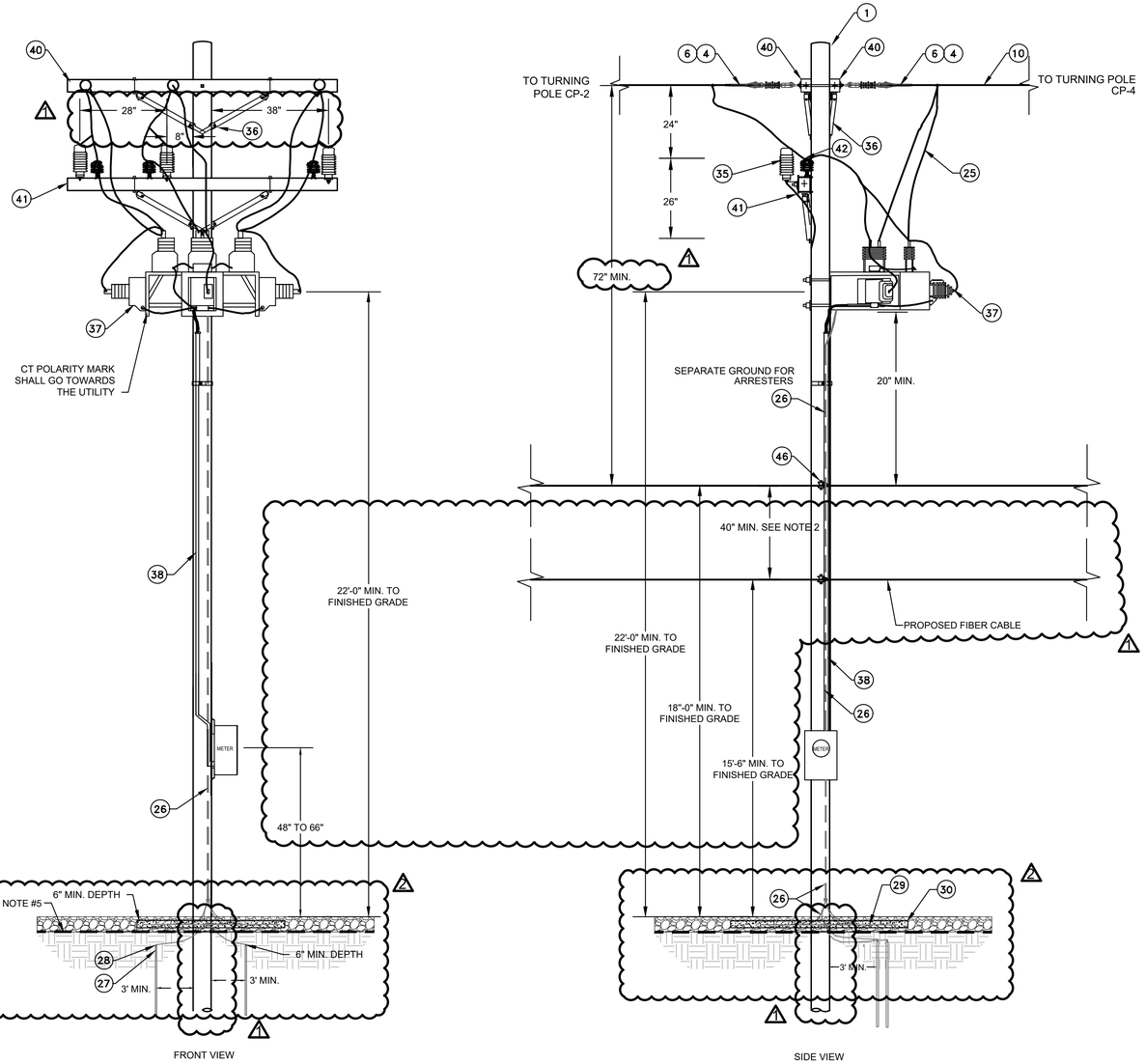
STATE OF NEW YORK · JENNIFER SUZANNE CRAWFORD · LICENSED PROFESSIONAL ENGINEER · 150555
9/5/2024

DATE	9/5/2023	DRAWN BY:	JAT
SCALE	AS SHOWN	DESIGNED BY:	JAT
		CHECKED BY:	JSC
		APPROVED BY:	JSC

N:\WORK\5566.02 Elk Street\DWG\5566.02 DETAILS.dwg

C&A JOB# 5566.03

DRAWING: E-2.2

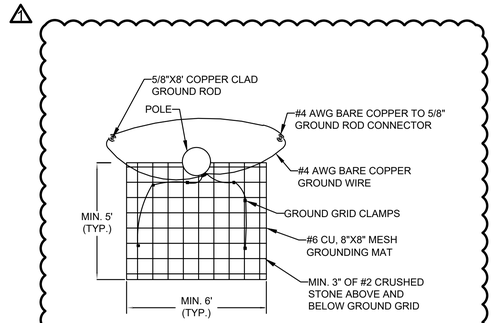


A E2.3 CUSTOMER OWNED POLE WITH UTILITY OWNED METER (C-3)

SCALE: N.T.S.

NOTES:

1. POLE DRAWINGS TAKEN FROM UTILITY COORDINATION DRAWING TITLED "INTERCONNECT CP#3 REVENUE METER", REVISION NUMBER 1, DATED 10/17/2022 BY JEM ENGINEERING.
2. CONTRACTOR TO PROVIDE AS-BUILT DISTANCES FOR USE IN RECORD DRAWINGS.
3. METER OWNED AND MAINTAINED BY NATIONAL GRID, METER SOCKET INSTALLED BY CUSTOMER.
4. CUSTOMER TO OWN AND INSTALL POLE.
5. EXISTING DEMARCATION LAYER TO BE CUT AS NEEDED TO ALLOW FOR POLE INSTALLATION. NEW DEMARCATION LAYER TO BE PLACED AROUND POLE DURING BACKFILL PRIOR TO REPLACING STONE COVER MATERIAL. SEE WORK PLAN FOR ADDITIONAL INFORMATION.



GROUND GRID DETAIL

SCHEDULE OF POLE EQUIPMENT	
NO.	DESCRIPTION
1	40' SOUTHERN YELLOW PINE CLASS 2 POLE
2	CORRUGATED METAL PIPE - 4' DIAMETER
4	INSULATOR SUSPENSION TYPE 5 KV
5	7/16" HIGH STRENGTH GALV STEEL GUY WIRE
6	STRAIGHT STRAIN DEAD END CLAMP
8	RIGID CONDUIT RISER WITH END FITTING, 5" UNLESS OTHERWISE INDICATED
9	1/C TERMINATION, 15 KV
10	PRIMARY CONDUCTOR
18	SIEMENS SWITCH, 25KV, 150KV BIL, 900A VERTICAL MOUNT
19	SIEMENS SWITCH CONTROL ROD
20	G&W RECLOSER, 15KV WITH 400:1 CTS, VOLTAGE SENSING (X6), EXTERNAL CPT
21	SEL-651R RECLOSER CONTROLLER
24	POTHEAD BRACKET - ALUMA-FORM TB-EMB-13PA
25	SOLID COPPER CONDUCTOR
26	#4 SOLID COPPER
27	5/8" x 8' GROUND ROD
28	GROUND ROD CLAMP
29	8" X 8" COPPER GROUND MESH (5' x 6' GRID)
30	#2 CRUSHED STONE, 6" MIN. DEPTH
35	LIGHTNING ARRESTOR - EATON HEAVY DUTY, 3KV, 2.55MCOV
36	METAL CROSSARM BRACE - 26"
37	3CT / 3PT METER CLUSTER - (BY NATIONAL GRID)
38	1.5" RIGID CONDUIT, LENGTH AS REQD. FOR SECONDARY METERING AND RECLOSER
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42	STANDOFF INSULATOR, 5KV
43	FIBERGLASS GUY STRAIN INSULATOR, 60" MINIMUM
44	BONDING JUMPER TO GUY WIRE
45	LABEL INDICATING SWITCH DESIGNATION
46	SECONDARY CLEVIS WITH SPOOL INSULATOR
51	1/2" EXTRA HIGH STRENGTH, 7 STRAND GALV. STEEL GUY WIRE
52	1/2" UTILITY GRADE DEAD END FORMED WIRE
53	YELLOW GUY MARKER, 96" LONG
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55	CHANCE SS5 SCREW ANCHOR EXTENSIONS (AS REQUIRED)
56	CHANCE SS5 SCREW ANCHOR, 8"-10"-12" HELIX COMBO W/ TWINEYE PULLING EYE OR APPROVED EQUAL (CHANCE CAT #012642AEJ)
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BETWEEN LIVE PARTS: 12" / 7"
LIVE PARTS TO GROUND: 8" / 6"
LIVE PARTS TO VEHICULAR TRAFFIC: 22" (N/A)

POLE BURIAL DEPTH	
POLE	DEPTH
40'	6'-0"
45'	6'-6"
50'	7'-0"
55'	7'-6"

REV #	DESCRIPTION	DATE	BY
2	UPDATES PER DEC COMMENTS	3/22/24	JAT
1	UPDATES PER NATIONAL GRID COMMENTS	3/5/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

UTILITY POLE ELEVATIONS - SHEET 3

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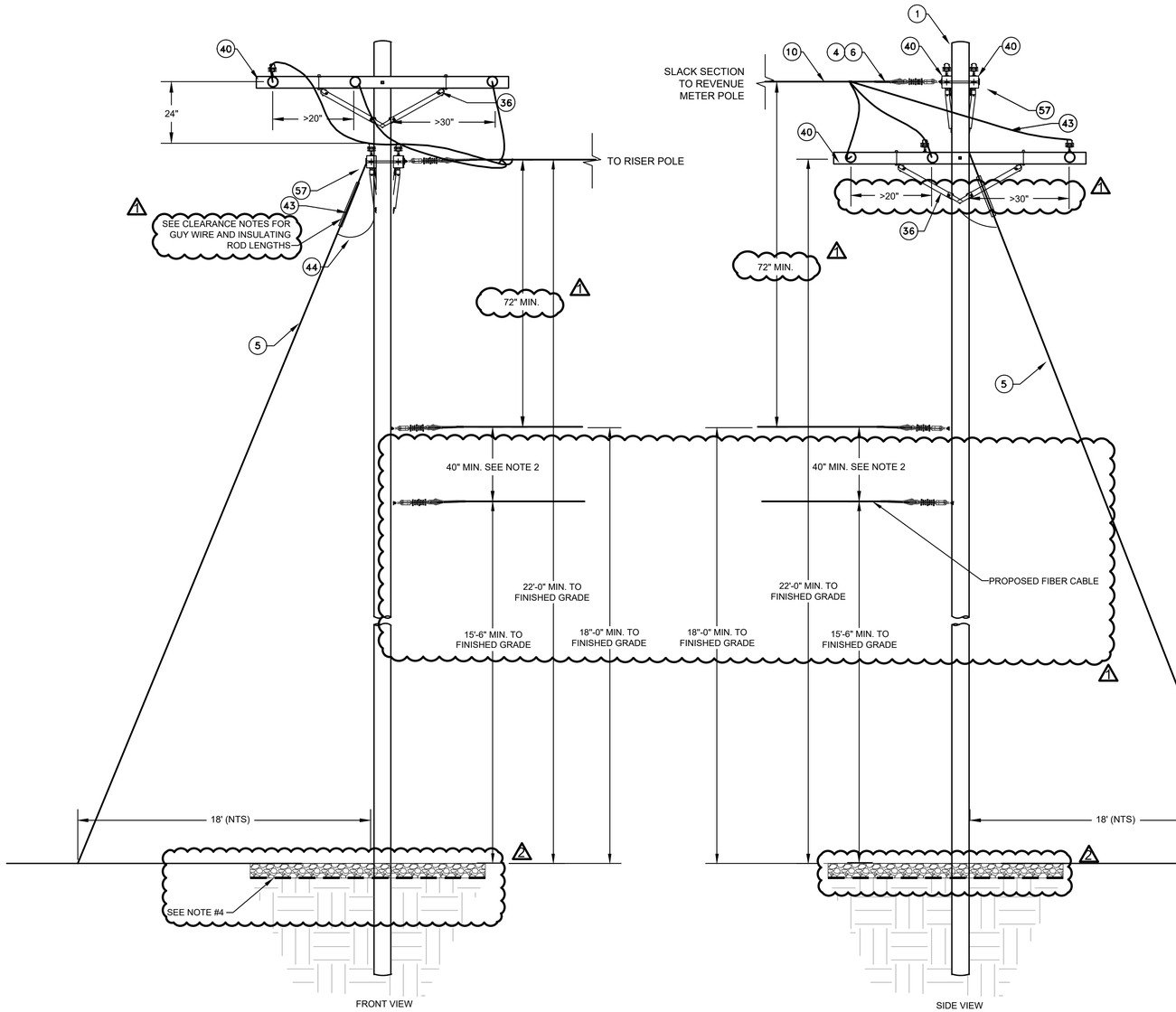
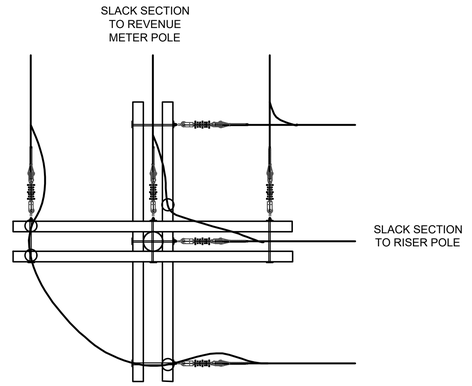
STATE OF NEW YORK — JENNIFER SUZANNE GRANCHELLI — 150556 — LICENSED PROFESSIONAL ENGINEER

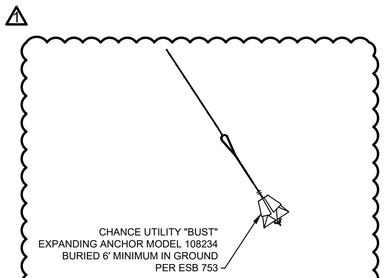
9/5/2024

DATE	DRAWN BY: JAT	H:\WORK\5566.02 Elk Street\DWG\5566.02 DETAILS.dwg
9/5/2023	DESIGNED BY: JAT	
SCALE	CHECKED BY: JSC	C&A JOB# 5566.03
AS SHOWN	APPROVED BY: JSC	DRAWING: E-2.3





(PLAN VIEW)



GUY ANCHOR DETAIL

SCHEDULE OF POLE EQUIPMENT	
NO.	DESCRIPTION
1	40' SOUTHERN YELLOW PINE CLASS 2 POLE
2	CORRUGATED METAL PIPE - 4' DIAMETER
4	INSULATOR SUSPENSION TYPE 5 KV
5	7/16" HIGH STRENGTH GALV STEEL GUY WIRE
6	STRAIGHT STRAIN DEAD END CLAMP
8	RIGID CONDUIT RISER WITH END FITTING, 5" UNLESS OTHERWISE INDICATED
9	1/C TERMINATION, 15 KV
10	PRIMARY CONDUCTOR
18	SIEMENS SWITCH, 25KV, 150KV BIL, 900A VERTICAL MOUNT
19	SIEMENS SWITCH CONTROL ROD
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29	8" X 8" COPPER GROUND MESH (5' x 6' GRID)
30	#2 CRUSHED STONE, 6" MIN. DEPTH
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36	METAL CROSSARM BRACE - 26"
37	3CT / 3PT METER CLUSTER - (BY NATIONAL GRID)
38	1.5" RIGID CONDUIT, LENGTH AS REQD. FOR SECONDARY METERING AND RECLOSER
39	15KV, 600A SINGLE PHASE DISCONNECT
40	DOUBLE 8' WOOD CROSSARM (8' L x 4.25" H x 3.25" W)
41	SINGLE 8' WOOD CROSSARM (8' L x 4.25" H x 3.25" W)
42	STANDOFF INSULATOR, 5KV
43	FIBERGLASS GUY STRAIN INSULATOR, 60" MINIMUM
44	BONDING JUMPER TO GUY WIRE
45	LABEL INDICATING SWITCH DESIGNATION
46	SECONDARY CLEVIS WITH SPOOL INSULATOR
51	1/2" EXTRA HIGH STRENGTH, 7 STRAND GALV. STEEL GUY WIRE
52	1/2" UTILITY GRADE DEAD END FORMED WIRE
53	YELLOW GUY MARKER, 96" LONG
54	EXTRA HIGH STRENGTH STEEL, ALUMOWELD, STRANDVICE (RANGE 0.455"-0.520")
55	CHANCE SS5 SCREW ANCHOR EXTENSIONS (AS REQUIRED)
56	CHANCE SS5 SCREW ANCHOR, 8"-10"-12" HELIX COMBO W/ TWINEYE PULLING EYE OR APPROVED EQUAL (CHANCE CAT #012642AEJ)
57	SINGLE DOWN GUY ASSEMBLY - HEAVY DUTY (THROUGH BOLT)
58	0.5A FUSED CUTOUT

GENERAL NOTES:

1. UTILITY POLES ARE SHOWN AS CONCEPTUAL AND ARE FOR DIAGRAMMATIC PURPOSES ONLY. SCHEDULE ABOVE LISTS THE MAJOR ITEMS OF EQUIPMENT ONLY. ALL OTHER EQUIPMENT NECESSARY FOR PURPOSE INDICATED SHALL BE PROVIDED UNDER THIS CONTRACT.
2. ALL EQUIPMENT AND MATERIALS SHALL BE LISTED FOR THE PURPOSE AND INSTALLED IN ACCORDANCE WITH THE CURRENT VERSION OF THE NATIONAL ELECTRICAL CODE AND NATIONAL ELECTRIC SAFETY CODE.
3. RECLOSER SHALL BE EQUIPPED WITH THREE (3) 400:1 CURRENT TRANSFORMERS AND SIX(6) LOW ENERGY VOLTAGE SENSING DEVICES ON LINE/UTILITY SIDE. CPT TO BE MOUNTED TO RECLOSER FRAME BY VENDOR.
4. RECLOSER CONTROLLER SHALL BE PROVIDED BY RECLOSER MANUFACTURER AND BE EQUIPPED WITH LOW ENERGY ANALOG INPUTS. ALL NECESSARY CABLING SHALL BE PROVIDED BY RECLOSER MANUFACTURER TO PROVIDE A COMPLETE AND OPERABLE SYSTEM.
5. CONTRACTOR SHALL LEAVE ADEQUATE CONDUCTOR LENGTH PER PHASE FOR UTILITY CONNECTION.
6. CONTRACTOR SHALL INSTALL AND MAKE ALL ELECTRICAL AND COMMUNICATION CONNECTIONS AS SHOWN ON THESE CONTRACT DOCUMENTS.
7. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND IN ACCORDANCE WITH THE CURRENT VERSION OF THE NEC AND ALL LOCAL APPLICABLE CODES AND STANDARDS.
8. THE SWITCH OPERATING HANDLE SHALL BE GROUNDED AND CONNECTED TO A GROUND EQUIPOTENTIAL MAT AT THE BASE OF THE POLE. HANDLE TO BE MOUNTED BETWEEN 3' AND 4' TO GROUND
9. ALL CLEARANCES TO MEET NESC AND NATIONAL GRID 753 SPECIFICATIONS

ESB 753 CLEARANCES (RECOMMENDED / MINIMUM):
BETWEEN LIVE PARTS: 12" / 7"
LIVE PARTS TO GROUND: 8" / 6" 1
LIVE PARTS TO VEHICULAR TRAFFIC: 22" (N/A)

POLE BURIAL DEPTH	
POLE	DEPTH
40'	6'-0"
45'	6'-6"
50'	7'-0"
55'	7'-6"

CLEARANCE NOTES:

1. GUY WIRES SHALL BE 25 FT. MINIMUM LEAD WITH INSULATOR.
2. GUY WIRES SHALL UTILIZE AN INSULATING ROD THAT IS MINIMUM 54" LONG, BUT LONGER IF THERE IS THE POTENTIAL TO COME INTO CONTACT WITH ENERGIZED EQUIPMENT UPON FAILURE OF THE GUY WIRE ANCHOR.
3. THE SECTION OF THE GUY WIRE BELOW THE INSULATING ROD SHALL BE BONDED TO NEUTRAL.
4. CLEARANCE FROM THE INSULATING ROD TO THE PRIMARY CONDUCTOR SHALL BE A MINIMUM OF 6" FOR DOWN GUYS, OR 11" MINIMUM FOR SPAN GUYS.
5. ANCHOR SHALL BE BURIED 6 FT. IN GROUND MINIMUM.

A E2.4 CUSTOMER TURNING POLE (C-4)

SCALE: N.T.S.

NOTES:
1. POLE DRAWINGS TAKEN FROM UTILITY COORDINATION DRAWING TITLED "INTERCONNECT POLE#4 TURNING POLE", REVISION NUMBER 1, DATED 10/17/2022 BY JEM ENGINEERING.
2. CONTRACTOR TO PROVIDE AS-BUILT DISTANCES FOR USE IN RECORD DRAWINGS.
3. CUSTOMER TO OWN AND INSTALL POLE.
4. EXISTING DEMARCATION LAYER TO BE CUT AS NEEDED TO ALLOW FOR POLE INSTALLATION. NEW DEMARCATION LAYER TO BE PLACED AROUND POLE DURING BACKFILL PRIOR TO REPLACING STONE COVER MATERIAL. SEE WORK PLAN FOR ADDITIONAL INFORMATION.

REV #	DESCRIPTION	DATE	BY
2	UPDATES PER DEC COMMENTS	3/22/24	JAT
1	UPDATES PER NATIONAL GRID COMMENTS	3/5/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

UTILITY POLE ELEVATIONS - SHEET 4

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

STATE OF NEW YORK — JENNIFER SUZANNE CROUCH — LICENSED PROFESSIONAL ENGINEER — 150556

3/22/2024

DATE	9/5/2023	DRAWN BY:	JAT
SCALE	AS SHOWN	DESIGNED BY:	JAT
		CHECKED BY:	JSC
		APPROVED BY:	JSC

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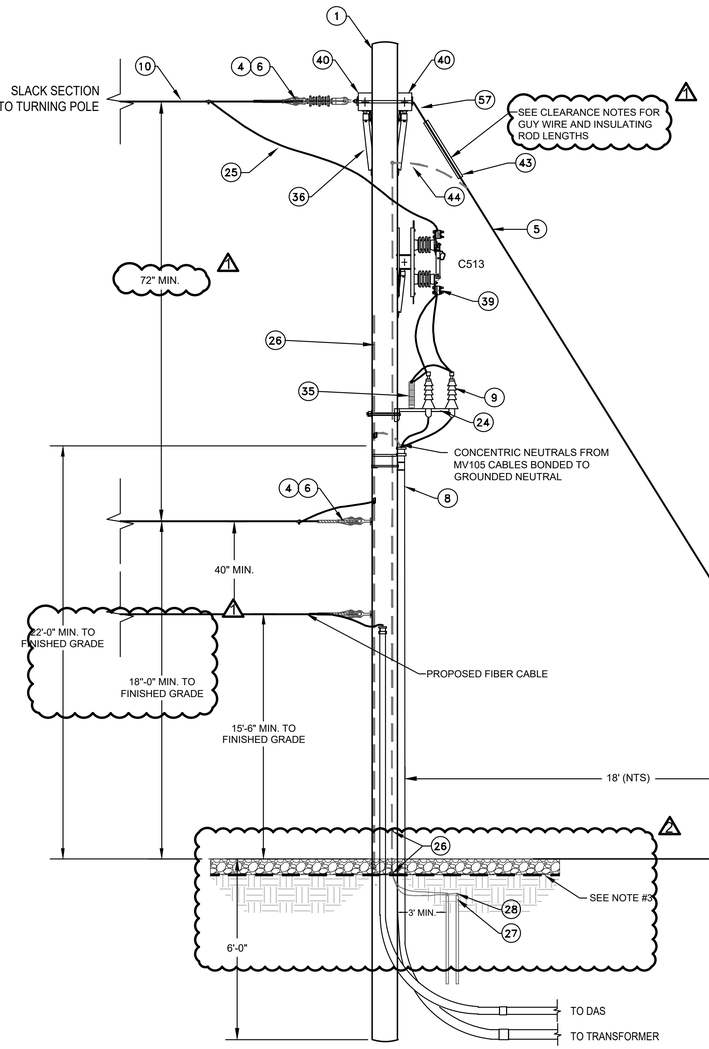
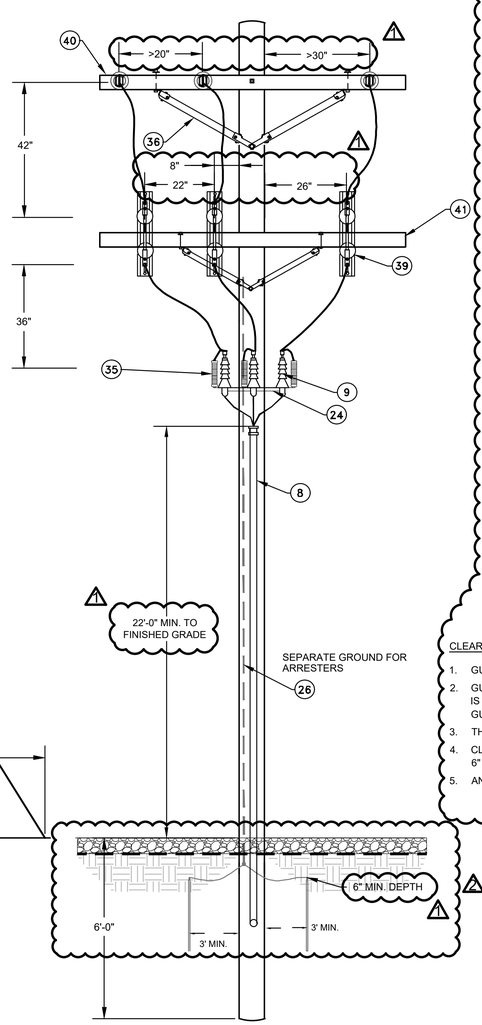
C&A JOB# 5566.03 — DRAWING: E-2.4



FRONT VIEW



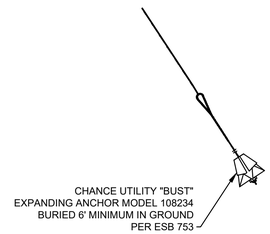
SIDE VIEW

A E2.5 CUSTOMER OWNED RISER POLE (C-5)

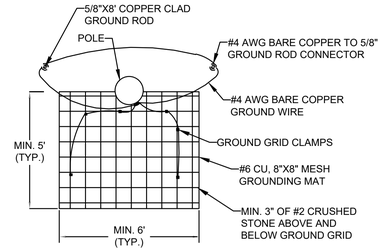
SCALE: N.T.S.

NOTES:

1. POLE DRAWINGS TAKEN FROM UTILITY COORDINATION DRAWING TITLED "INTERCONNECT POLE#5 RISER POLE", REVISION NUMBER 1, DATED 10/17/2022 BY JEM ENGINEERING.
2. CUSTOMER TO OWN AND INSTALL POLE.
3. EXISTING DEMARCATION LAYER TO BE CUT AS NEEDED TO ALLOW FOR POLE INSTALLATION. NEW DEMARCATION LAYER TO BE PLACED AROUND POLE DURING BACKFILL PRIOR TO REPLACING STONE COVER MATERIAL. SEE WORK PLAN FOR ADDITIONAL INFORMATION.



GUY ANCHOR DETAIL



GROUND GRID DETAIL

CLEARANCE NOTES:

1. GUY WIRES SHALL BE 25 FT. MINIMUM LEAD WITH INSULATOR.
2. GUY WIRES SHALL UTILIZE AN INSULATING ROD THAT IS MINIMUM 54" LONG, BUT LONGER IF THERE IS THE POTENTIAL TO COME INTO CONTACT WITH ENERGIZED EQUIPMENT UPON FAILURE OF THE GUY WIRE ANCHOR.
3. THE SECTION OF THE GUY WIRE BELOW THE INSULATING ROD SHALL BE BONDED TO NEUTRAL.
4. CLEARANCE FROM THE INSULATING ROD TO THE PRIMARY CONDUCTOR SHALL BE A MINIMUM OF 6" FOR DOWN GUYS, OR 11" MINIMUM FOR SPAN GUYS.
5. ANCHOR SHALL BE BURIED 6 FT. IN GROUND MINIMUM.

SCHEDULE OF POLE EQUIPMENT

NO.	DESCRIPTION
1	40' SOUTHERN YELLOW PINE CLASS 2 POLE
2	CORRUGATED METAL PIPE - 4' DIAMETER
4	INSULATOR SUSPENSION TYPE 5 KV
5	7/16" HIGH STRENGTH GALV STEEL GUY WIRE
6	STRAIGHT STRAIN DEAD END CLAMP
8	RIGID CONDUIT RISER WITH END FITTING, 5" UNLESS OTHERWISE INDICATED
9	1/C TERMINATION, 15 KV
10	PRIMARY CONDUCTOR
18	SIEMENS SWITCH, 25KV, 150KV BIL, 900A VERTICAL MOUNT
19	SIEMENS SWITCH CONTROL ROD
20	G&W RECLOSER, 15KV WITH 400:1 CTS, VOLTAGE SENSING (X6), EXTERNAL CPT
21	SEL-651R RECLOSER CONTROLLER
24	POTHEAD BRACKET - ALUMA-FORM TB-EMB-13PA
25	SOLID COPPER CONDUCTOR
26	#4 SOLID COPPER
27	5/8" x 8' GROUND ROD
28	GROUND ROD CLAMP
29	8" X 8" COPPER GROUND MESH (5' x 6' GRID)
30	#2 CRUSHED STONE, 6" MIN. DEPTH
35	LIGHTNING ARRESTOR - EATON HEAVY DUTY, 3KV, 2.55MCOV
36	METAL CROSSARM BRACE - 26"
37	3CT / 3PT METER CLUSTER - (BY NATIONAL GRID)
38	1.5" RIGID CONDUIT, LENGTH AS REQD. FOR SECONDARY METERING AND RECLOSER
39	15KV, 600A SINGLE PHASE DISCONNECT
40	DOUBLE 8' WOOD CROSSARM (8' L x 4.25" H x 3.25" W)
41	SINGLE 8' WOOD CROSSARM (8' L x 4.25" H x 3.25" W)
42	STANDOFF INSULATOR, 5KV
43	FIBERGLASS GUY STRAIN INSULATOR, 60" MINIMUM
44	BONDING JUMPER TO GUY WIRE
45	LABEL INDICATING SWITCH DESIGNATION
46	SECONDARY CLEVIS WITH SPOOL INSULATOR
51	1/2" EXTRA HIGH STRENGTH, 7 STRAND GALV. STEEL GUY WIRE
52	1/2" UTILITY GRADE DEAD END FORMED WIRE
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54	EXTRA HIGH STRENGTH STEEL, ALUMOWELD, STRANDVICE (RANGE 0.455"-0.520")
55	CHANCE SS5 SCREW ANCHOR EXTENSIONS (AS REQUIRED)
56	CHANCE SS5 SCREW ANCHOR, 8"-10"-12" HELIX COMBO W/ TWINEYE PULLING EYE OR APPROVED EQUAL (CHANCE CAT #012642AEJ)
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58	0.5A FUSED CUTOUT

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9. ALL CLEARANCES TO MEET NESC AND NATIONAL GRID 753 SPECIFICATIONS

ESB 753 CLEARANCES (RECOMMENDED / MINIMUM):
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LIVE PARTS TO GROUND: 8" / 6"
LIVE PARTS TO VEHICULAR TRAFFIC: 22" (N/A)

POLE BURIAL DEPTH

POLE	DEPTH
40'	6'-0"
45'	6'-6"
50'	7'-0"
55'	7'-6"

REV #	DESCRIPTION	DATE	BY
2	UPDATES PER DEC COMMENTS	3/22/24	JAT
1	UPDATES PER NATIONAL GRID COMMENTS	3/5/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

UTILITY POLE ELEVATIONS - SHEET 5

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

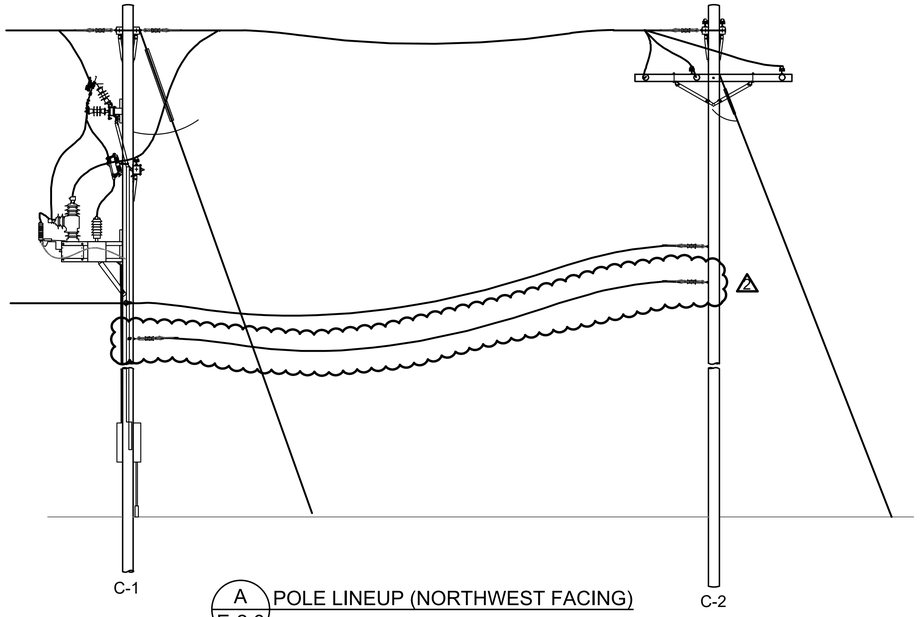
CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

STATE OF NEW YORK — JENNIFER SUZANNE CROWFORD — LICENSED PROFESSIONAL ENGINEER — 100566

5/22/2024

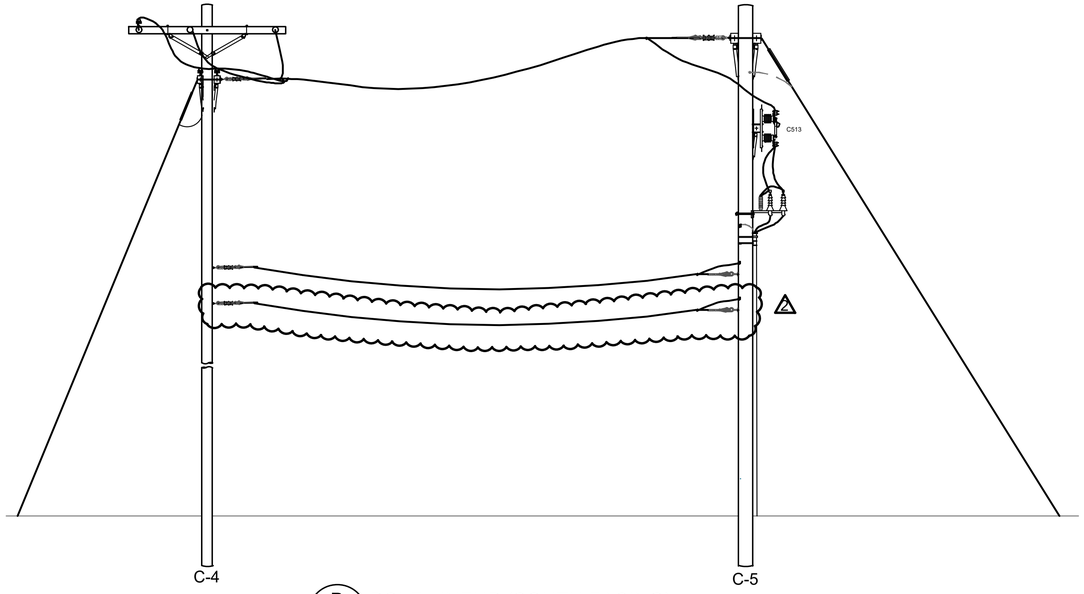
IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON TO ALTER THESE DOCUMENTS IN ANY WAY, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

DATE	DRAWN BY: JAT	n:\WORK\5566.02 Elk Street\DWG\5566.02 DETAILS.dwg
9/5/2023	DESIGNED BY: JAT	
SCALE	CHECKED BY: JSC	C&A JOB#: 5566.03
AS SHOWN	APPROVED BY: JSC	DRAWING: E-2.5



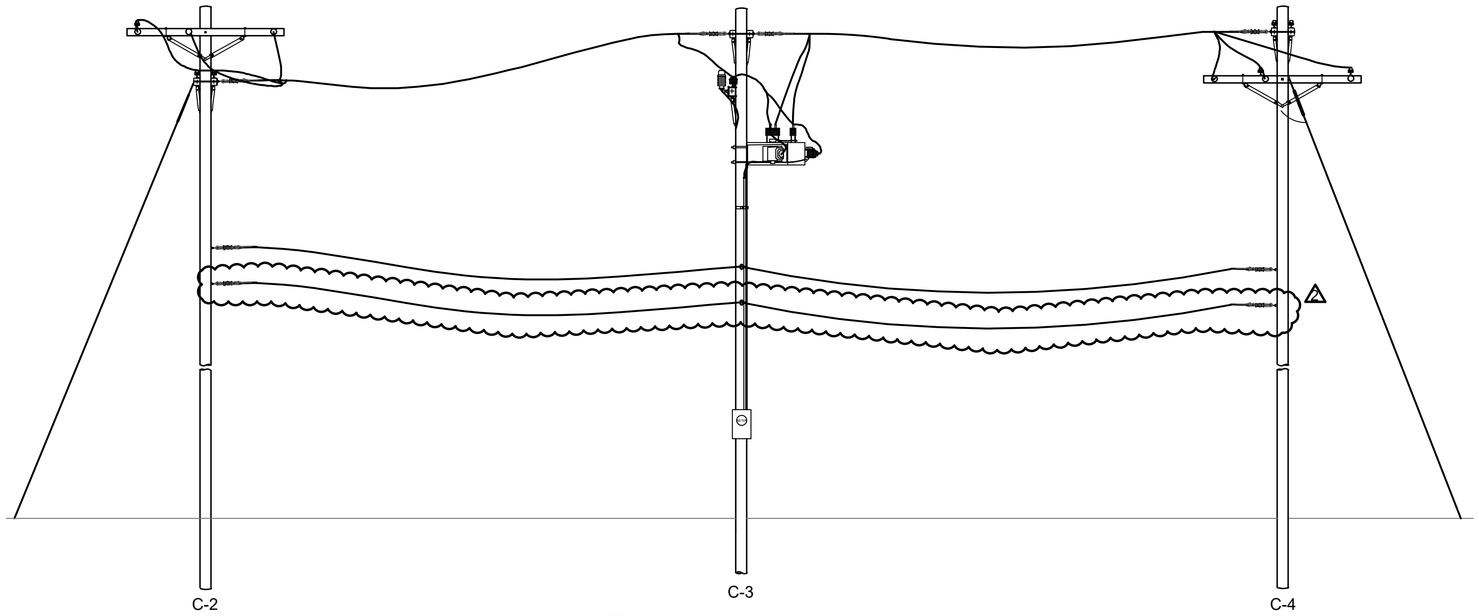
A E-2.6 POLE LINEUP (NORTHWEST FACING)

SCALE: N.T.S.



B E-2.6 POLE LINEUP (SOUTH FACING)

SCALE: N.T.S.



C E-2.6 POLE LINEUP (WEST FACING)

SCALE: N.T.S.

REV #	DESCRIPTION	DATE	BY
2	OVERHEAD COMMUNICATION CABLE UPDATE	3/22/24	JAT
1	SHEET TITLE UPDATE	9/7/23	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

UTILITY POLE ELEVATIONS - SHEET 6

INOVATEUS SOLAR LLC
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4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

LICENSED PROFESSIONAL ENGINEER — JENNIFER SUZANNE CRAWFORD — STATE OF NEW YORK — 100556

9/7/2024

DATE	9/5/2023
SCALE	AS SHOWN
DRAWN BY:	JAT
DESIGNED BY:	JAT
CHECKED BY:	JSC
APPROVED BY:	JSC
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C&A JOB#	5566.03
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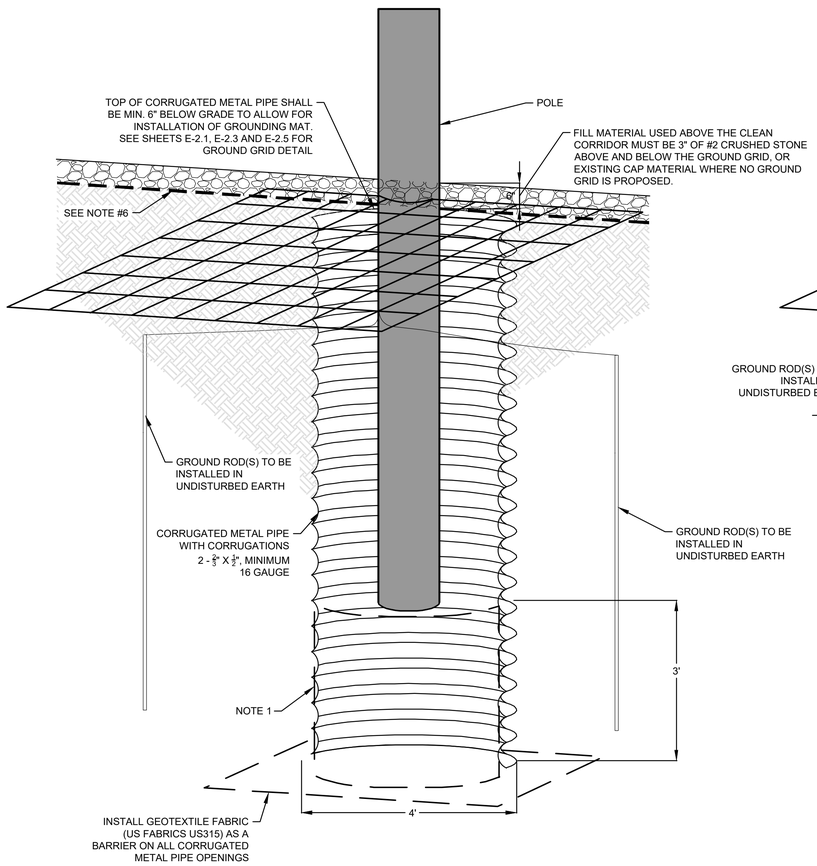
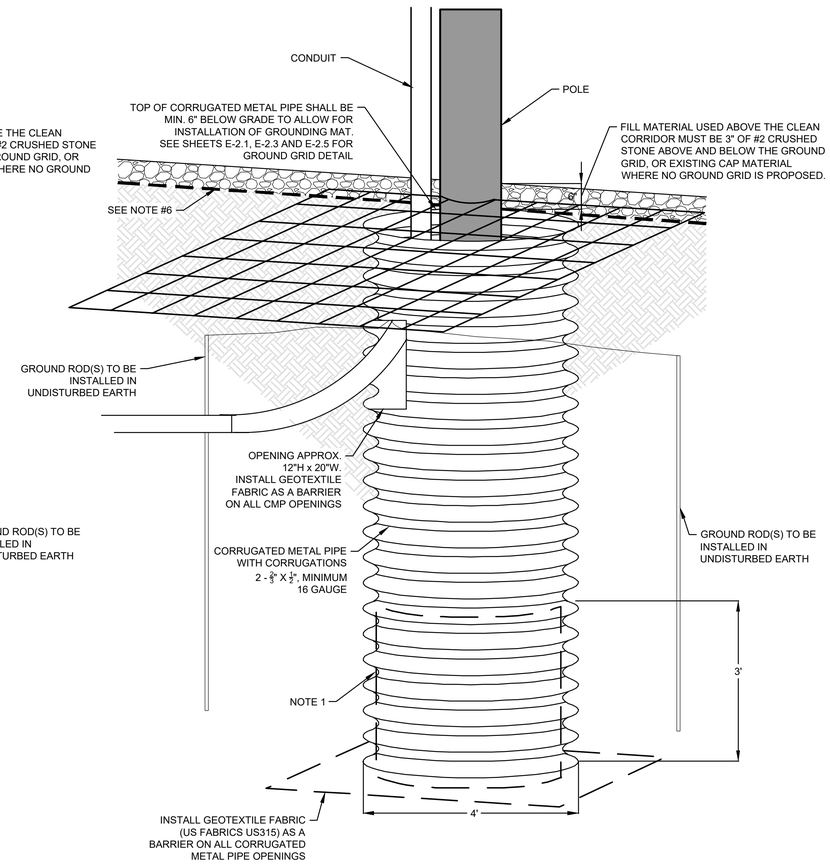




A E-2.7 CLEAN CORRIDOR DETAIL

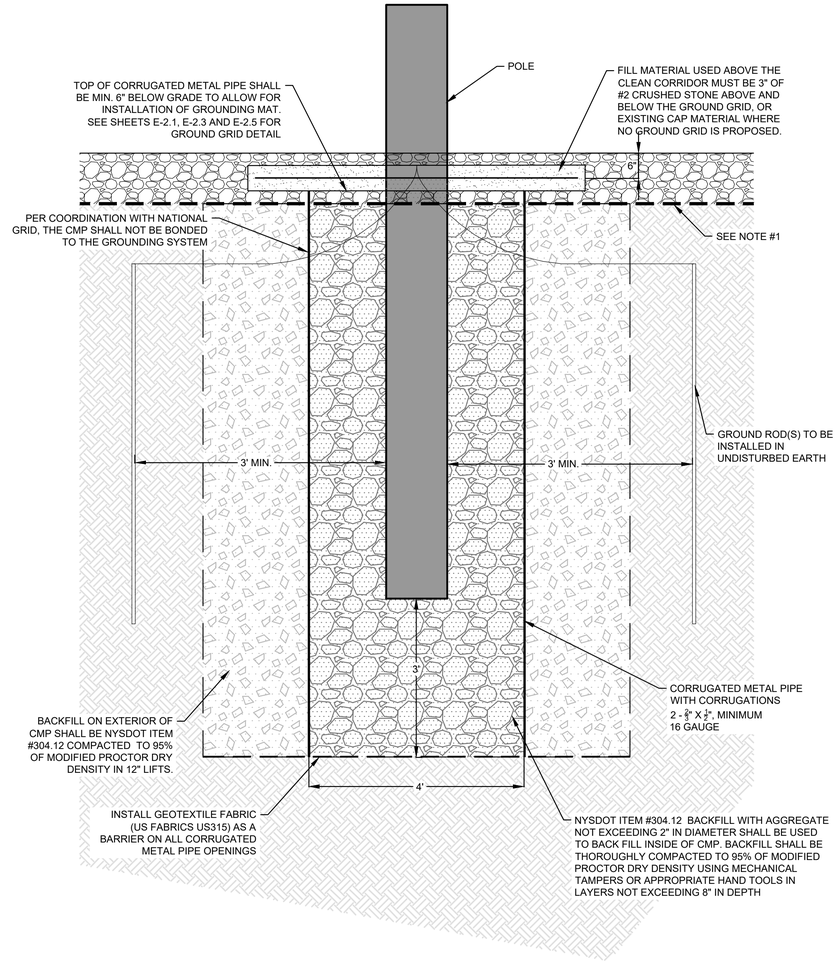
SCALE: N.T.S.

NOTES:

1. NYSDOT ITEM #304.12 BACKFILL WITH AGGREGATE NOT EXCEEDING 2" IN DIAMETER SHALL BE USED TO BACK FILL POLES. BACKFILL SHALL BE THOROUGHLY COMPACTED TO 95% OF MODIFIED PROCTOR DRY DENSITY USING MECHANICAL TAMPERS OR APPROPRIATE HAND TOOLS IN LAYERS NOT EXCEEDING 8" IN DEPTH.
2. UTILITY CREWS TO INSTALL POLE AND CONNECT TO GROUNDING ALREADY INSTALLED WITH CORRUGATED PIPE, GEOTEXTILE BARRIER AND NYSDOT ITEM #304.12 COMPACTED IN 8" LIFTS.
3. BACKFILL SHALL BE NYSDOT ITEM #304.12 COMPACTED IN 12" LIFTS.
4. CORRUGATED STEEL PIPE SHALL BE FREE OF ALL BURRS AND JAGGED EDGES IN ORDER TO REDUCE THE RISK OF CUTTING INJURIES DURING HANDLING. CORRUGATED PIPE SHALL BE FITTED WITH EDGE TRIM SUCH AS NEOPRENE RUBBER TO COVER BURRS AND JAGGED EDGES.
5. GROUND MATS INSTALLED ABOVE CORRUGATED METAL PIPES SHALL BE LEFT EXPOSED AND BLOCKED OFF WITH CAUTION TAPE FOR AUDIT, THEN COVERED AS NECESSARY. GROUND MAT SHALL BE INSTALLED AFTER THE POLE IS INSTALLED.
6. EXISTING DEMARCATION LAYER TO BE CUT AS NEEDED TO ALLOW FOR POLE INSTALLATION. NEW DEMARCATION LAYER TO BE PLACED AROUND POLE DURING BACKFILL PRIOR TO REPLACING STONE COVER MATERIAL. SEE WORK PLAN FOR ADDITIONAL INFORMATION

CORRUGATED METAL PIPE DEPTH TABLE	
POLE	DEPTH
40'	9'-0"
45'	9'-6"
50'	10'-0"
55'	10'-6"

NOTE:
1. CLEAN CORRIDOR TO BE USED ON ALL UTILITY OWNED AND INSTALLED POLES, "U-1" AND "U-2"



B E-2.7 CLEAN CORRIDOR PROFILE VIEW

SCALE: N.T.S.

NOTES:

1. EXISTING DEMARCATION LAYER TO BE CUT AS NEEDED TO ALLOW FOR POLE INSTALLATION. NEW DEMARCATION LAYER TO BE PLACED AROUND POLE DURING BACKFILL PRIOR TO REPLACING STONE COVER MATERIAL. SEE WORK PLAN FOR ADDITIONAL INFORMATION.

REV #	DESCRIPTION	DATE	BY
1	SHEET ADDED PER NATIONAL GRID COMMENTS	3/5/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

UTILITY POLE ELEVATIONS - SHEET 7

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
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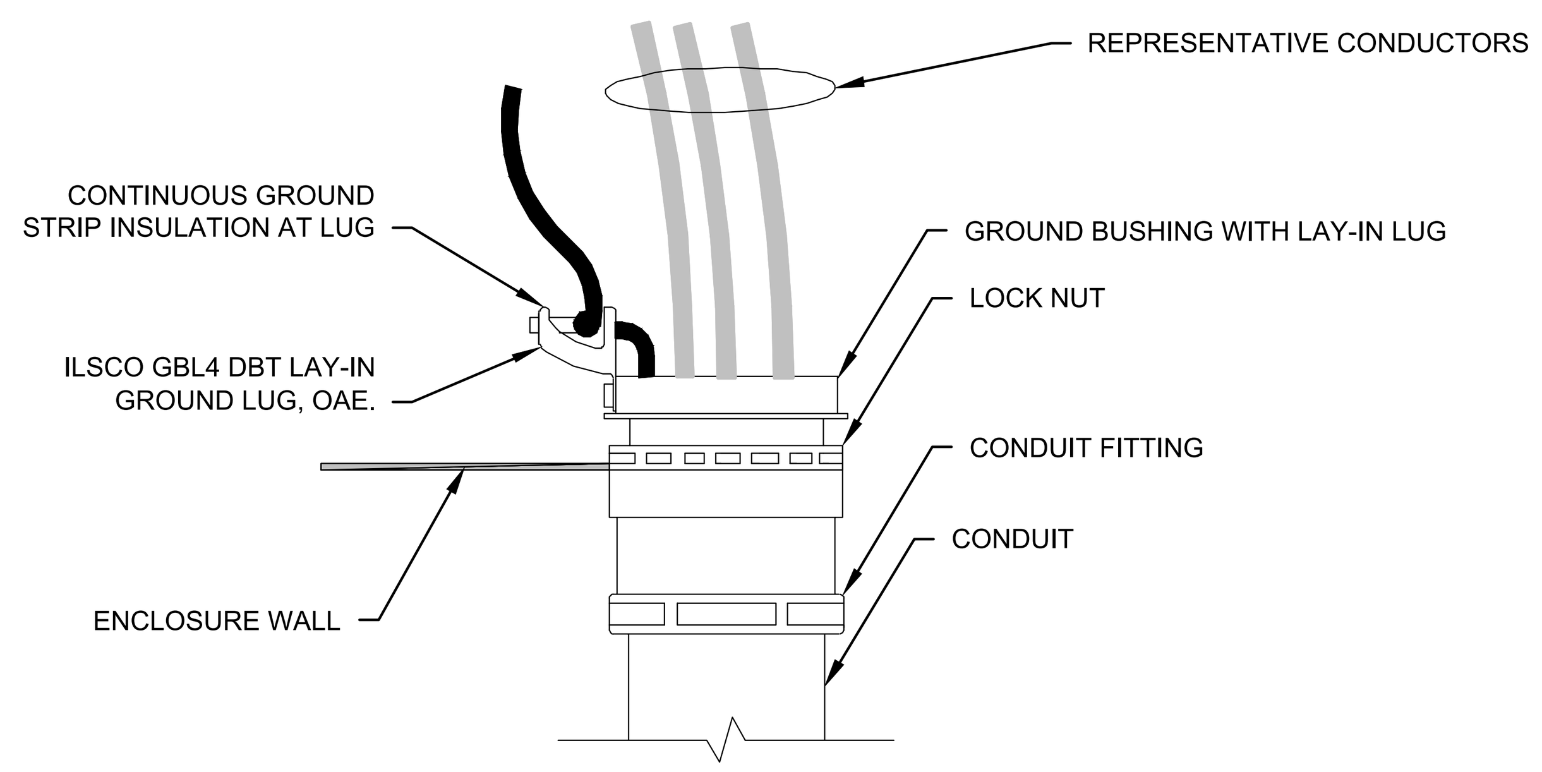
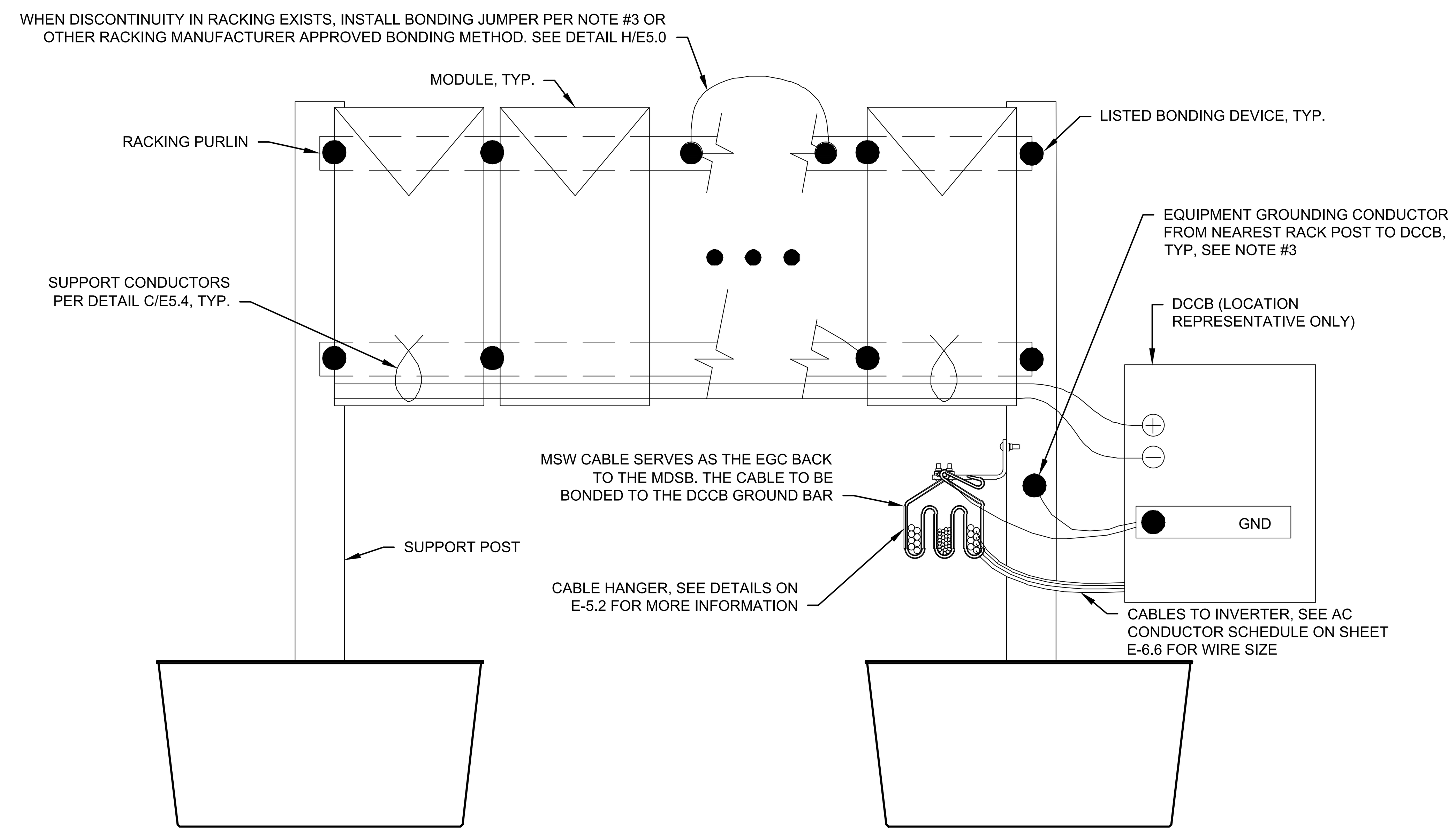
STATE OF NEW YORK — JENNIFER SUZANNE CRAWFORD — 122056 — LICENSED PROFESSIONAL ENGINEER
3/5/2024

DATE	3/5/24
SCALE	AS SHOWN
DRAWN BY:	JAT
DESIGNED BY:	JAT
CHECKED BY:	JSC
APPROVED BY:	JSC
H:\WORK\5566.02 Elk Street\DWG\5566.02 DETAILS.dwg	
C&A JOB#	5566.03
DRAWING:	E-2.7

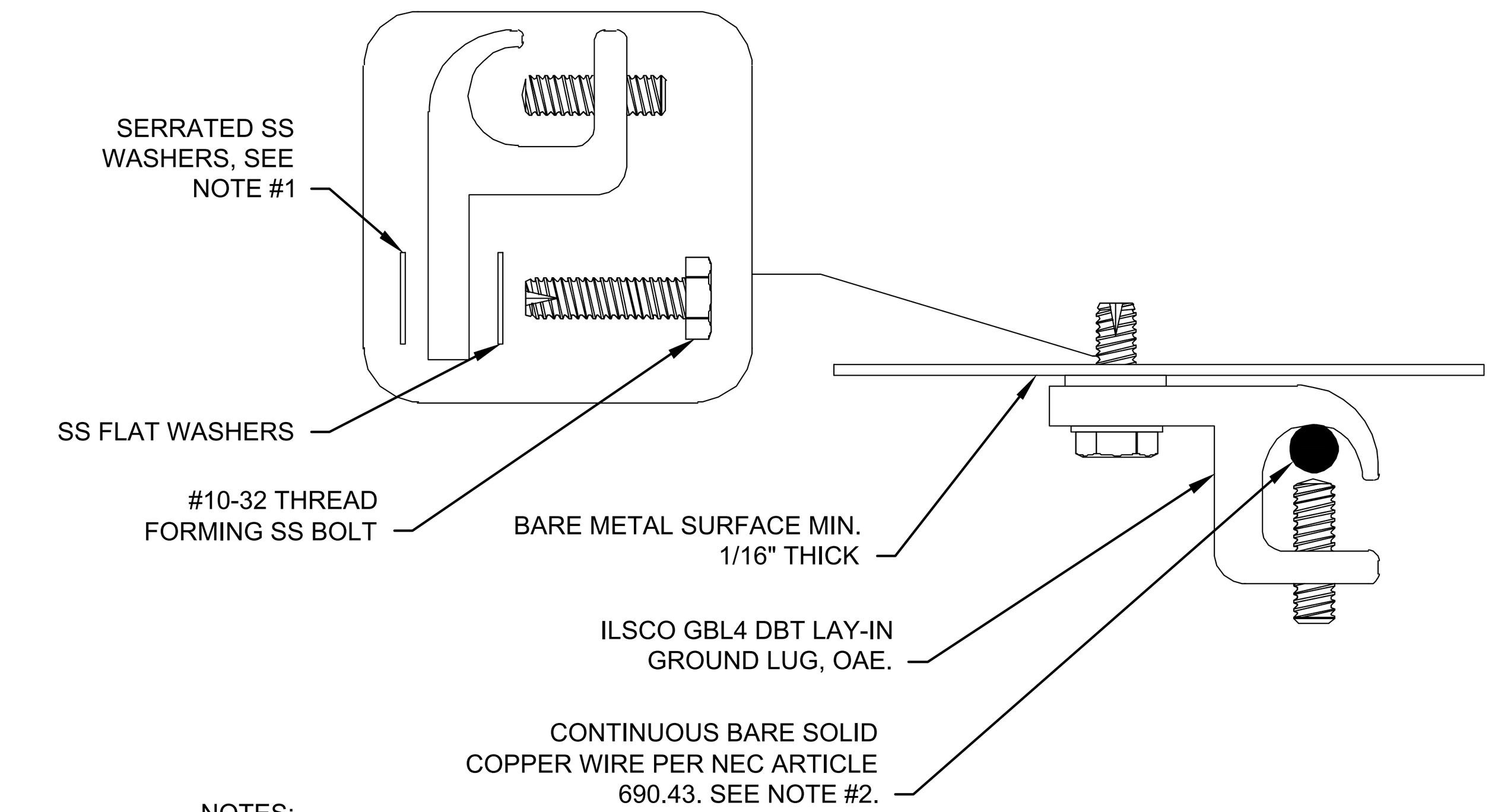


A
E5.0
CONDUIT GROUNDING DETAIL
SCALE: N.T.S.



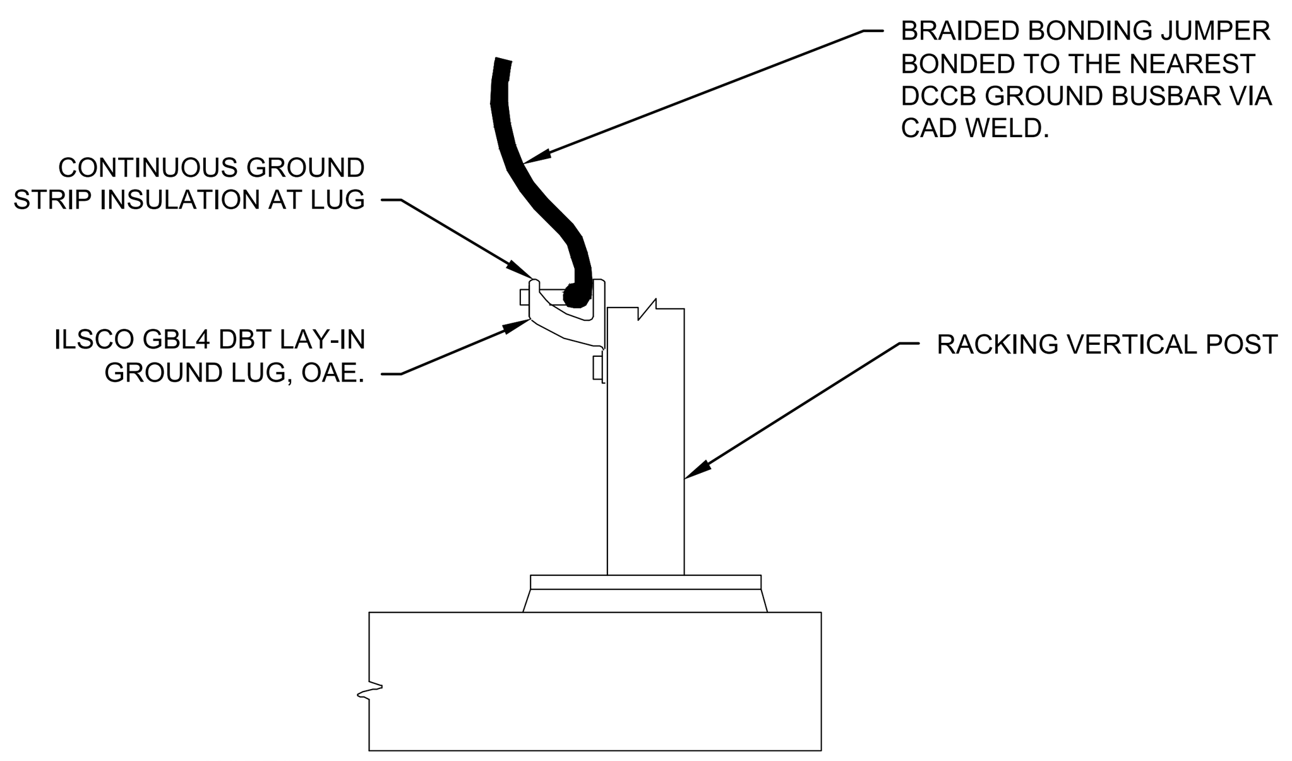
NOTES:
1. ALL EXPOSED CURRENT CARRYING METAL LIKELY TO BECOME ENERGIZED SHALL BE GROUNDED PER NEC690.43
2. ALL LUGS USED FOR BONDING SHALL BE RATED FOR DIRECT BURIAL AND LISTED FOR THE PURPOSE OF BONDING.
3. ARRAY EGC SHALL BE PROTECTED FROM PHYSICAL DAMAGE PER NEC 250.120(C). IF EGC IS SUBJECT TO PHYSICAL DAMAGE, USE #6 AWG MIN. OR INSTALL EGC IN A CONDUIT. IF INSTALLED IN CONDUIT, REFER TO CONDUCTOR SCHEDULE FOR SIZE. WHERE INSTALLED IN CONDUIT, AT LEAST ONE EGC IS REQUIRED WITHIN EACH CONDUIT.
4. MODULE GROUNDING REPRESENTATIVE. REFER TO RACKING MANUFACTURER INSTALLATION MANUAL FOR MORE INFORMATION.

F
E5.0
GROUND MOUNT MODULE GROUNDING
SCALE: N.T.S.



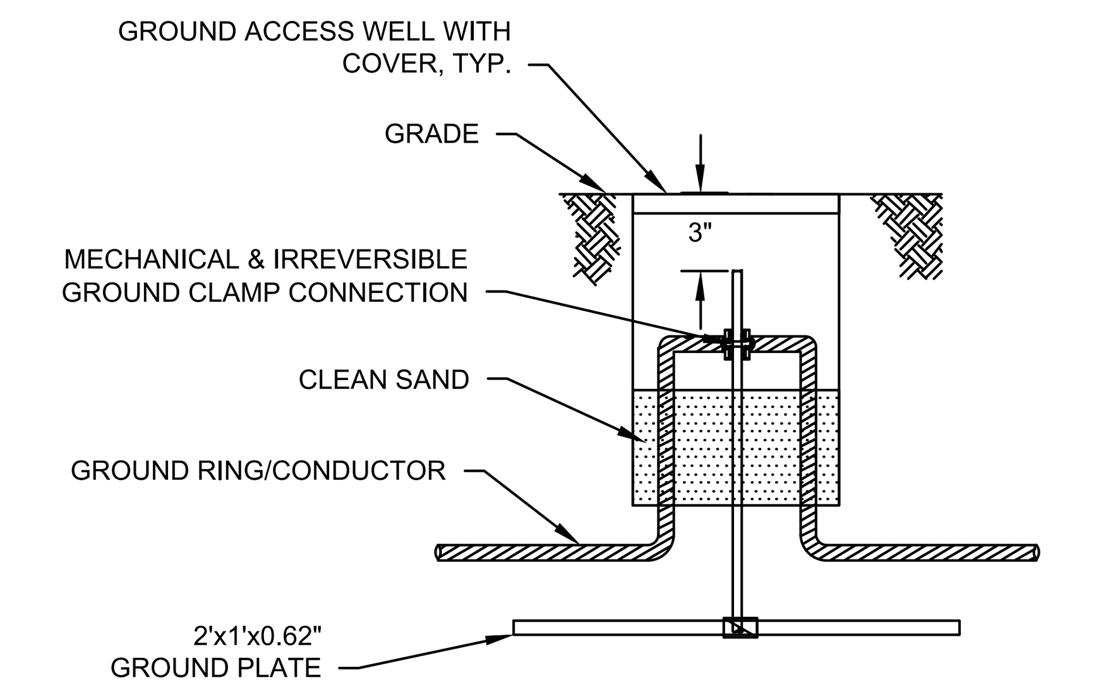
NOTES:
1. BARE METAL OR GALVANIZED SURFACES DO NOT REQUIRE ADDITIONAL STAR WASHER
2. ARRAY EGC SHALL BE PROTECTED FROM PHYSICAL DAMAGE PER NEC 250.120(C). IF EGC IS SUBJECT TO PHYSICAL DAMAGE, USE #6 AWG MIN.

B
E5.0
EQUIPMENT GROUNDING
SCALE: N.T.S.



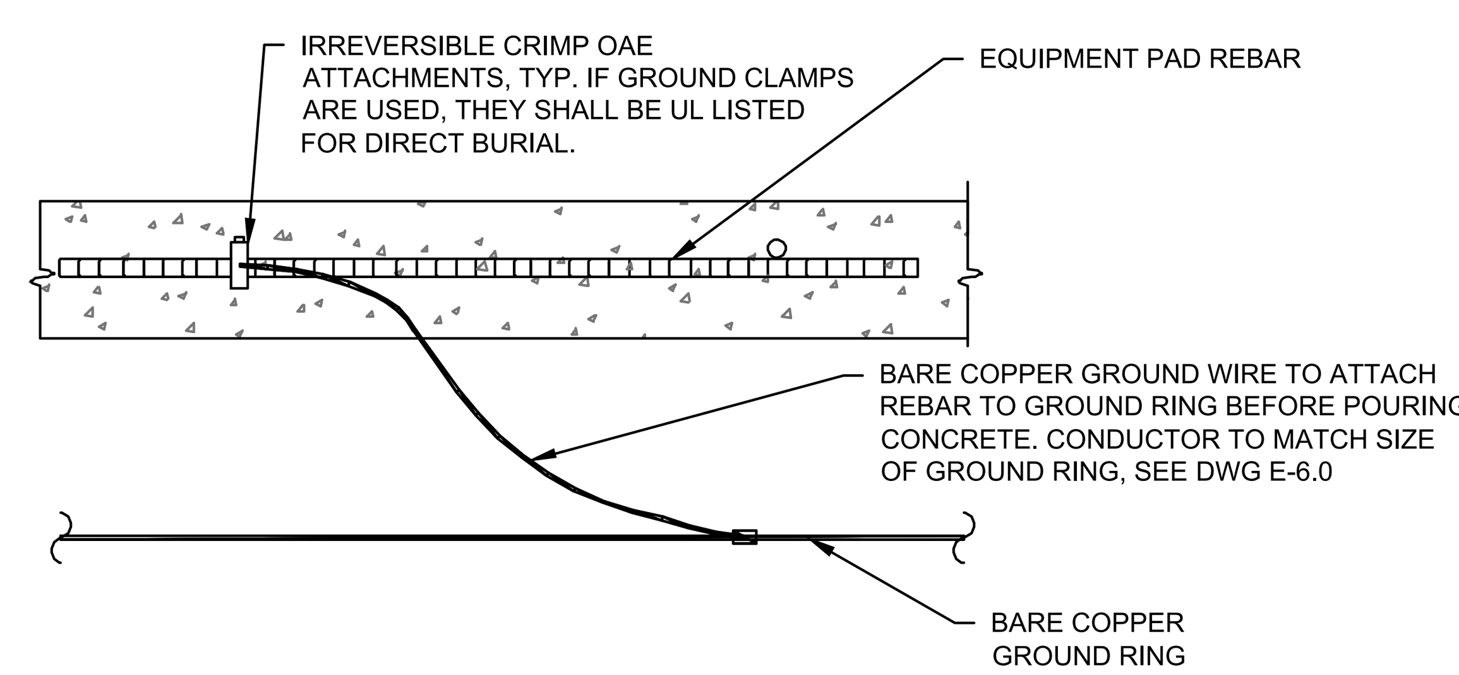
NOTES:
1. REMOVE ANY PAINT OR COATINGS TO ENSURE ADEQUATE ELECTRICAL CONTACT

C
E5.0
RACKING GROUNDING
SCALE: N.T.S.

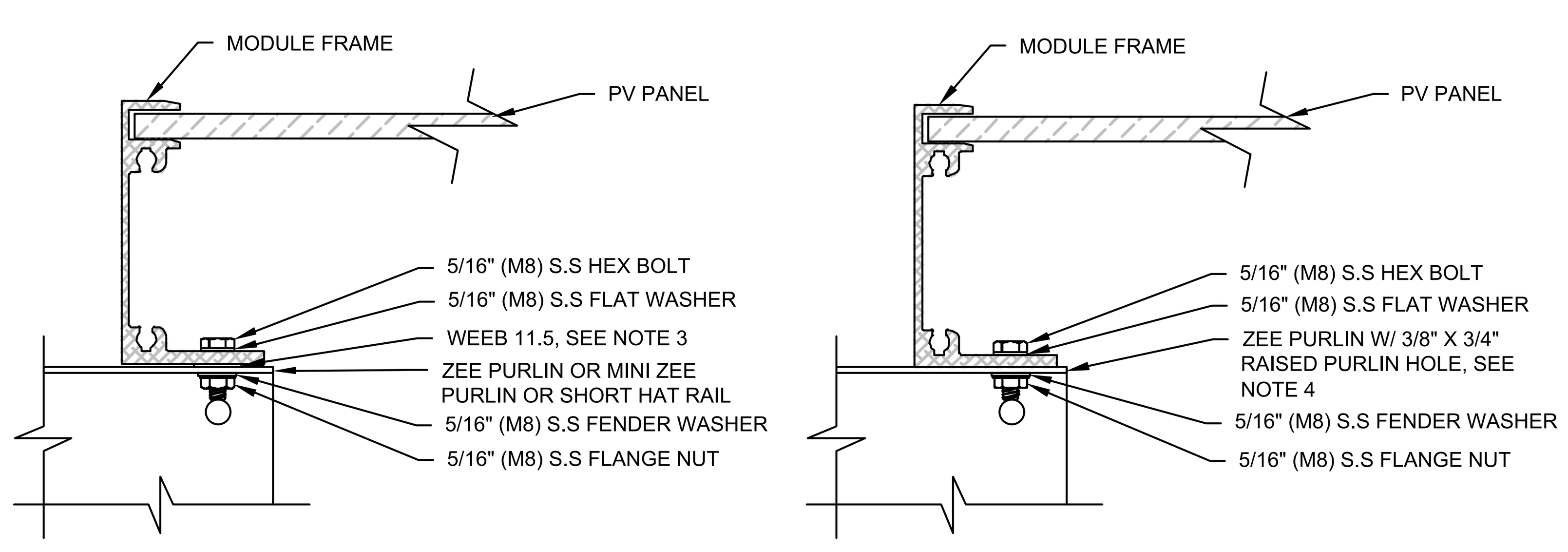


D
E5.0
GROUND TEST WELL
SCALE: N.T.S.

NOTES:
1. SEE DETAIL A/E5.1 FOR MORE INSTALLATION DETAILS.

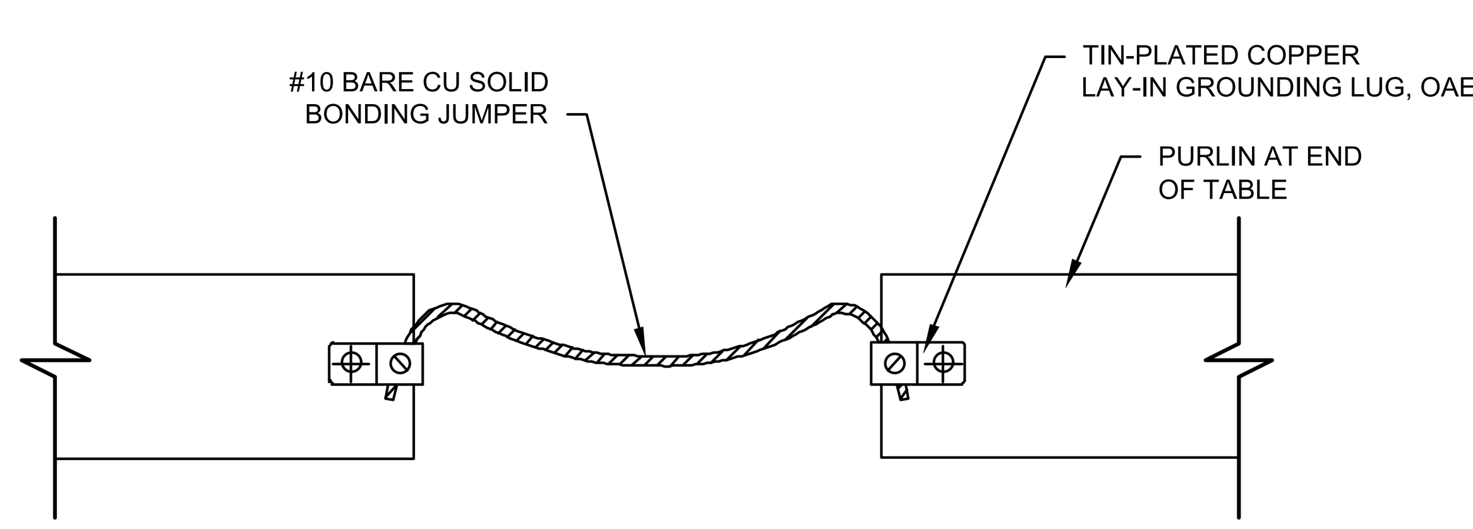


G
E5.0
GROUND RING-PAD BONDING
SCALE: N.T.S.



NOTES:
1. DRILLING A HOLE OR ALTERING THE MODULE FRAME IN ANY WAY MAY INVALIDATE THE MODULE WARRANTY.
2. "5/16" HEX BOLT W/ RAISED PURLIN HOLE" AND "WEEB 11.5" ARE UL 2703 APPROVED BONDING METHODS FOR VSUN545-144BMH-DG MODULES PER THE RBI GLIDE WAVE INSTALLATION GUIDE.
3. WEEB 11.5 REQUIRED IN 1 OF 4 PV MODULE MOUNTING HOLE LOCATIONS.
4. RAISED PURLIN HOLES TYPICALLY IN 2 OF 4 PV MODULE MOUNTING HOLE LOCATIONS, BUT ONLY REQUIRED IN 1. ZEE PURLINS WITHOUT RAISED PURLIN HOLES MAY BE USED FOR THE REMAINING MOUNTING HOLE LOCATIONS.

E
E5.0
MODULE GROUNDING DETAIL
SCALE: N.T.S.



H
E5.0
RACKING STRUCTURE ADJACENT TABLE BONDING CONNECTION
SCALE: N.T.S.

REV #	DESCRIPTION	DATE	BY

ELK STREET
SOLAR DEVELOPMENT PROJECT
CITY OF BUFFALO — ERIE COUNTY, NY

GROUNDING DETAILS

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
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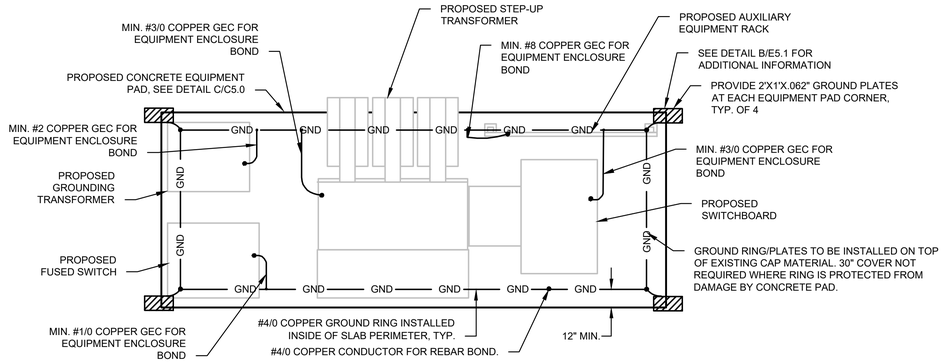
www.crawfordandassociates.com

STATE OF NEW YORK · JENNIFER SUZANNE CRAWFORD · 100566 · LICENSED PROFESSIONAL ENGINEER — 9/5/2024

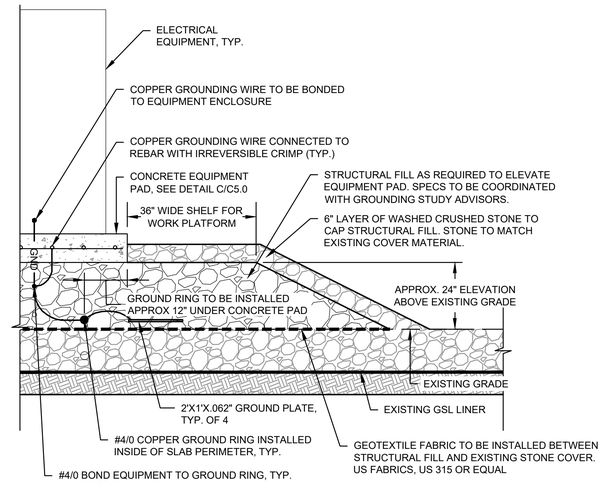
DATE	DRAWN BY: TSB	C&A JOB#	DRAWING:
9/5/2023	DESIGNED BY: TSB	5566.03	E-5.0
SCALE	CHECKED BY: JSC		
AS SHOWN	APPROVED BY: JSC		



A E5.1 GROUND RING DETAIL

SCALE: N.T.S.

NOTES:
1. EQUIPMENT LAYOUT IN THIS DETAIL IS REPRESENTATIVE ONLY AND IS SUBJECT TO CHANGE BASED ON SKID DESIGN. REFER TO DETAIL A/E5.4 FOR EQUIPMENT PAD LAYOUT.
2. GROUND RING/PLATES TO BE INSTALLED ON TOP OF EXISTING CAP MATERIAL.
3. GROUNDING RESISTANCE IS TO BE 5 OHMS OR LESS.
4. IF GROUNDING RESISTANCE VALUES CANNOT BE OBTAINED, INSTALL ADDITIONAL GROUNDING ELECTRODES AND RE-TEST.
5. GROUNDING RODS MAY NOT BE USED AS THEY WILL DAMAGE THE EXISTING GSL LINER.
6. EXTREME CAUTION MUST BE TAKEN TO ENSURE GROUND RING AND/OR ELECTRODES DO NOT PUNCTURE THE GSL LINER.
7. ALL UNDERGROUND CONDUCTOR TERMINATIONS AND SPLICES SHALL BE IRREVERSIBLY CRIMPED, AND CONNECTORS SHALL BE LISTED FOR USE IN GROUNDING SYSTEMS RATED FOR DIRECT BURIAL.
8. EQUIPMENT PAD GROUNDING DESIGN PENDING FINALIZATION OF GROUNDING STUDY.



B E5.1 GROUND RING TRENCHING DETAIL

SCALE: N.T.S.

NOTES:
1. GROUND RING/PLATES TO BE INSTALLED ON TOP OF EXISTING CAP MATERIAL.
2. GROUNDING RESISTANCE IS TO BE 5 OHMS OR LESS. GROUNDING RESISTANCE TO BE MEASURED AND RECORDED BEFORE CONCRETE EQUIPMENT PAD IS POURED.
3. IF GROUNDING RESISTANCE VALUES CANNOT BE OBTAINED, INSTALL ADDITIONAL GROUNDING ELECTRODES AND RE-TEST.
4. GROUNDING RODS MAY NOT BE USED AS THEY WILL DAMAGE THE EXISTING GSL LINER.
5. EXTREME CAUTION MUST BE TAKEN TO ENSURE GROUND RING AND/OR ELECTRODES DO NOT PUNCTURE THE GSL LINER.
6. NO EXCAVATION SHALL OCCUR ABOVE THE GSL LINER UNLESS SPECIFICALLY NOTED IN THIS DRAWING SET.
8. EQUIPMENT PAD GROUNDING DESIGN PENDING FINALIZATION OF GROUNDING STUDY.

REV #	DESCRIPTION	DATE	BY

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

GROUNDING RING DETAILS

INOVATEUS SOLAR LLC
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LICENSED PROFESSIONAL ENGINEER — JENNIFER SUZANNE CRAWFORD — STATE OF NEW YORK — 150556

9/5/2024

IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON TO ALTER THESE DOCUMENTS IN ANY WAY, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

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		CHECKED BY:	JSC
		APPROVED BY:	JSC

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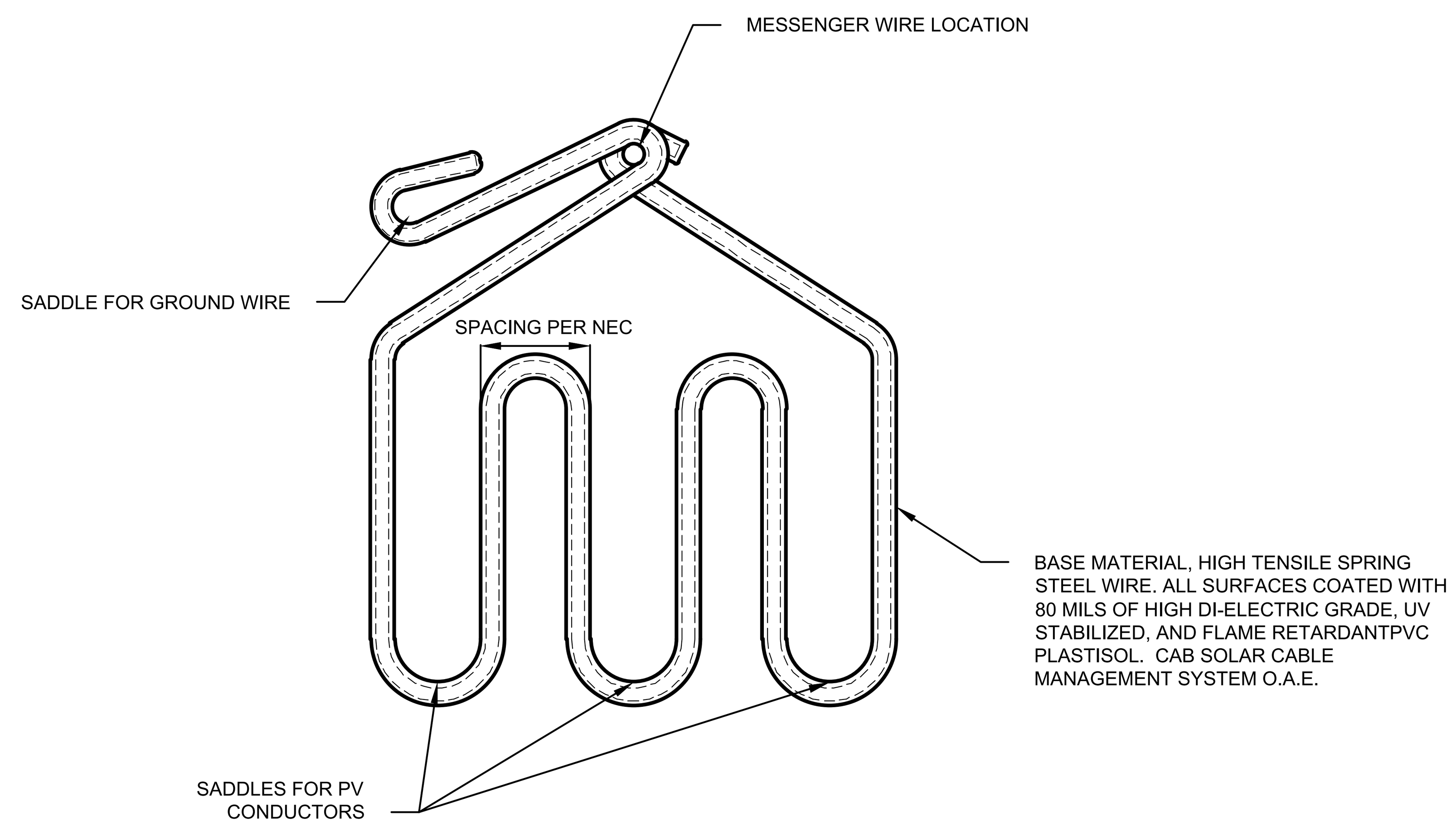
C&A JOB# 5566.03

DRAWING: E-5.1

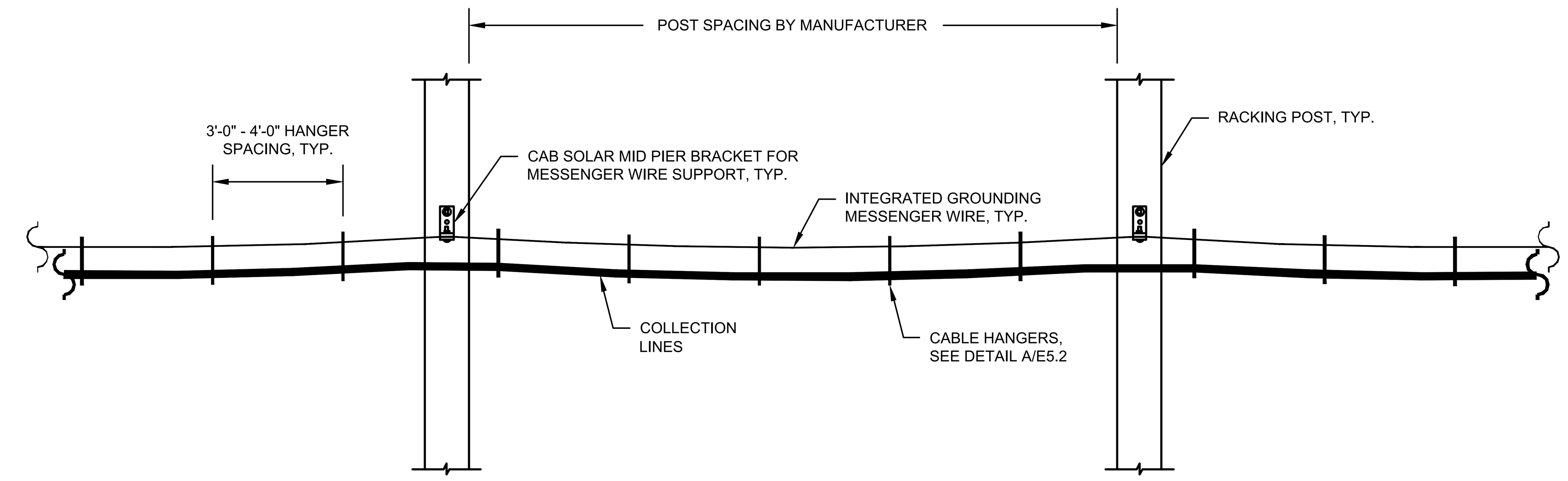


A MSW HANGER, TYP.

E5.2

SCALE: N.T.S.

NOTE:
1. DETAIL PROVIDED BY CAMBRIA COUNTY ASSOCIATION FOR THE BLIND AND HANDICAPPED (CAB SOLAR), AND MODIFIED BY CRAWFORD & ASSOCIATES ENGINEERING & LAND SURVEYING, PC.

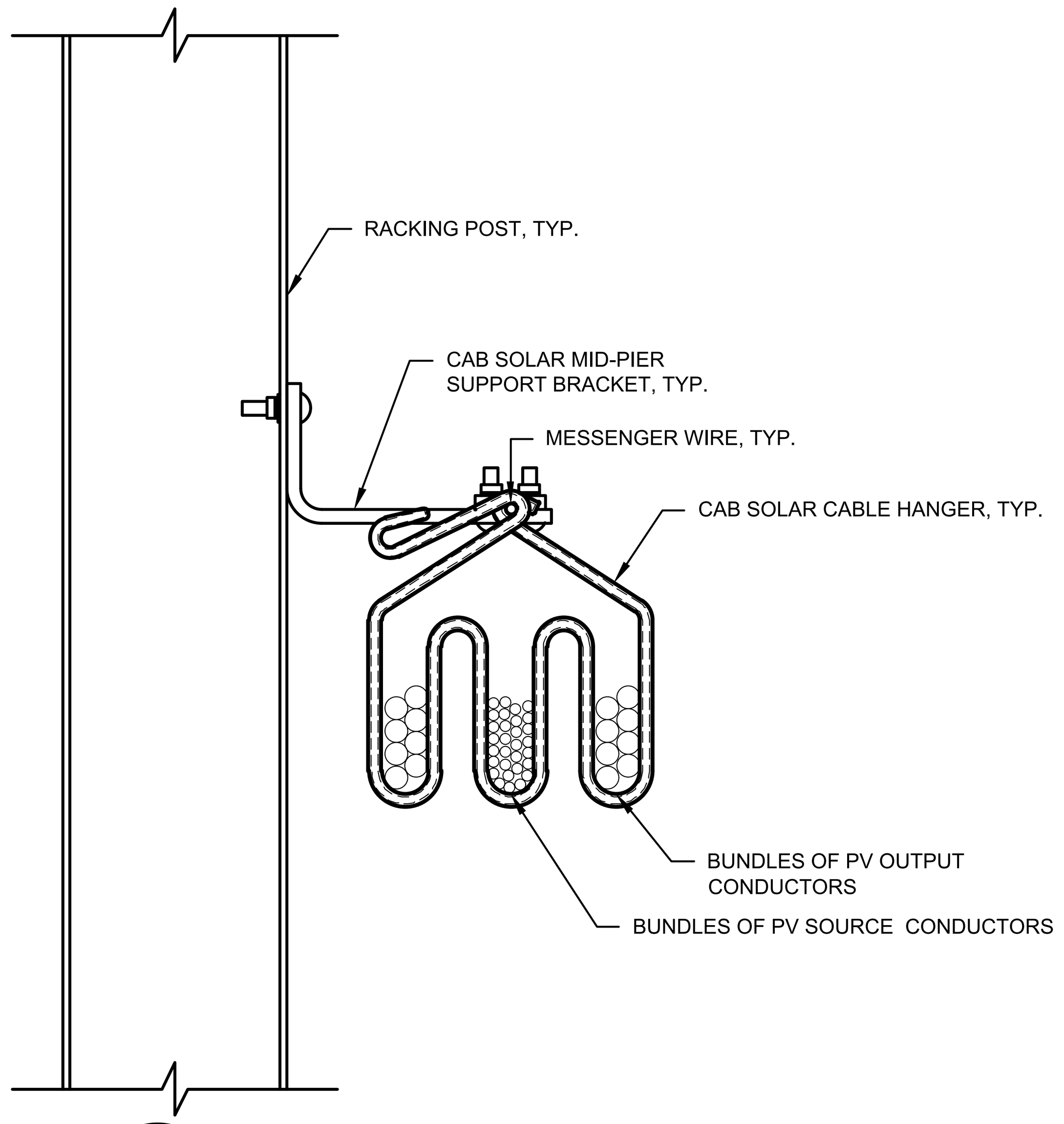


B TYPICAL MESSENGER SUPPORTED WIRING (MSW) DETAIL

E5.2

SCALE: N.T.S.

NOTE:
1. DETAIL FOR PATENTED SOLAR CABLE MANAGEMENT SYSTEM PROVIDED BY CAMBRIA COUNTY ASSOCIATION FOR THE BLIND AND HANDICAPPED (CAB SOLAR), AND MODIFIED FOR PRESENTATION BY CRAWFORD & ASSOCIATES ENGINEERING & LAND SURVEYING, PC.
2. MESSENGER SUPPORTED WIRING TO COMPLY WITH NYSERDA GUIDELINES. MIN. HEIGHT ABOVE GRADE TBD PENDING FINAL RESOLUTION.

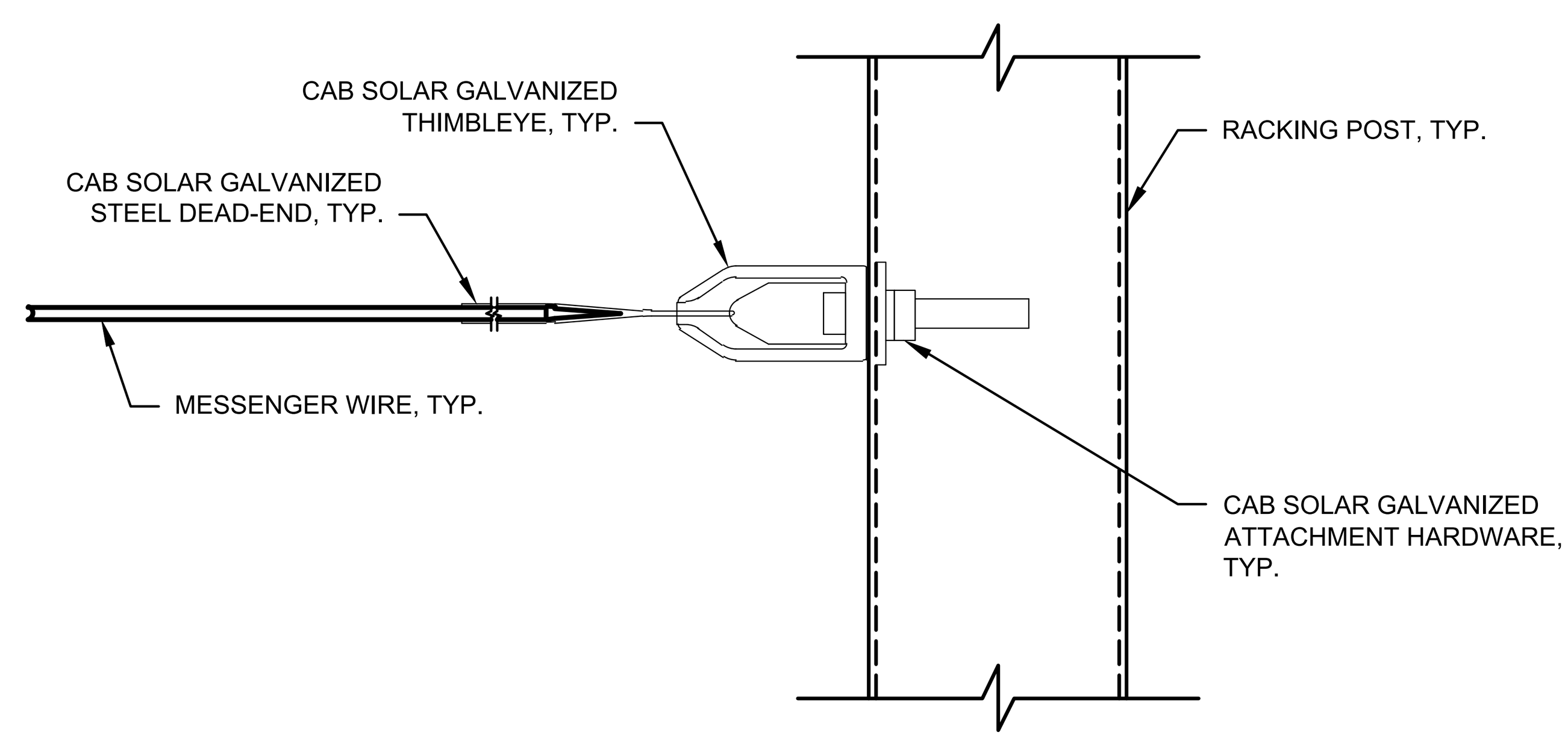


C MSW HANGER CROSS SECTION DETAIL

E5.2

SCALE: N.T.S.

NOTE:
1. DETAIL PROVIDED BY CAMBRIA COUNTY ASSOCIATION FOR THE BLIND AND HANDICAPPED (CAB SOLAR), AND MODIFIED BY CRAWFORD & ASSOCIATES ENGINEERING & LAND SURVEYING, PC.
2. BUNDLED CONDUCTORS TO BE SIZED IN ACCORDANCE WITH THERMAL AMPACITY LIMITS AS REQUIRED BY NEC. CONDUCTOR SIZE AND GROUPING TO BE REVIEWED BY EOR PRIOR TO CONSTRUCTION.

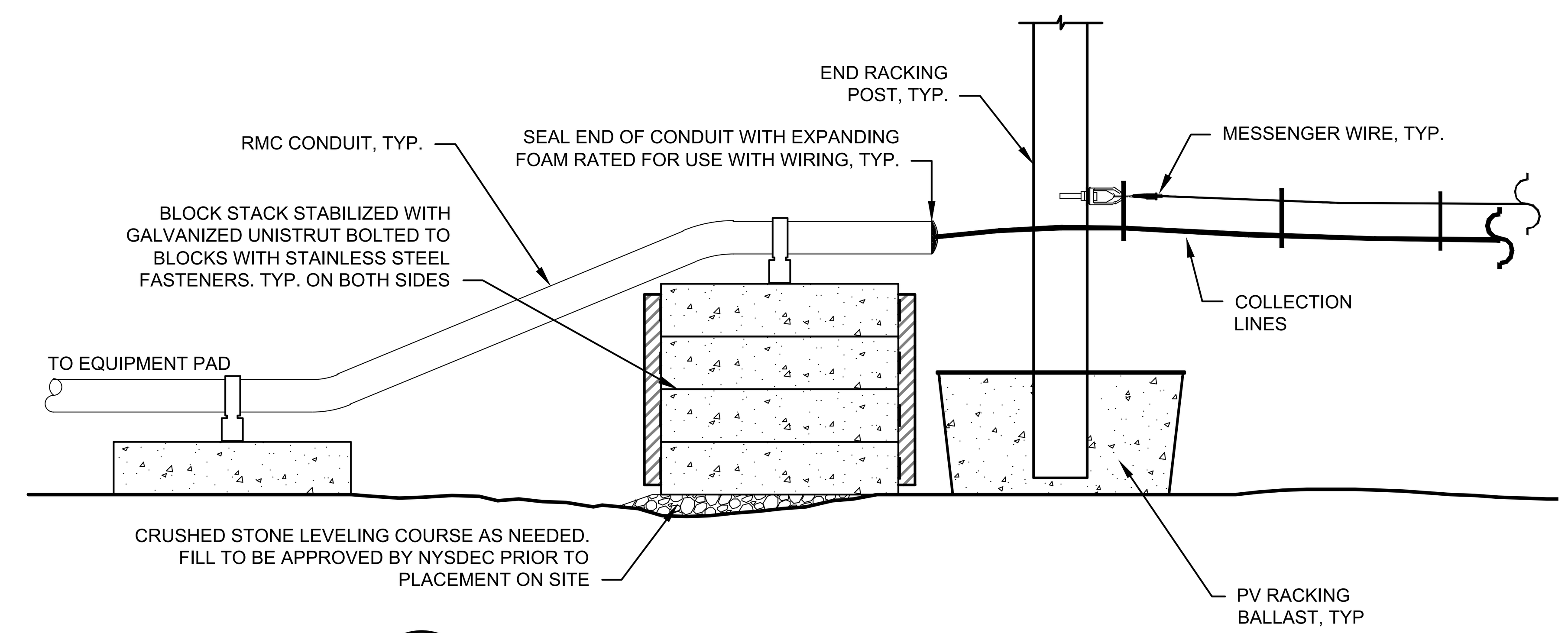


D MSW END PIER ATTACHEMENT DETAIL

E5.2

SCALE: N.T.S.

NOTE:
1. DETAIL PROVIDED BY CAMBRIA COUNTY ASSOCIATION FOR THE BLIND AND HANDICAPPED (CAB SOLAR), AND MODIFIED BY CRAWFORD & ASSOCIATES ENGINEERING & LAND SURVEYING, PC.



E CABLE TRAY TO CONDUIT TRANSITION

E5.2

SCALE: N.T.S.

REV #	DESCRIPTION	DATE	BY

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

WIRE MANAGEMENT
DETAILS

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STATE OF NEW YORK — JENNIFER SUZANNE CRAWFORD — LICENSED PROFESSIONAL ENGINEER — 100556 — 3/12/2024

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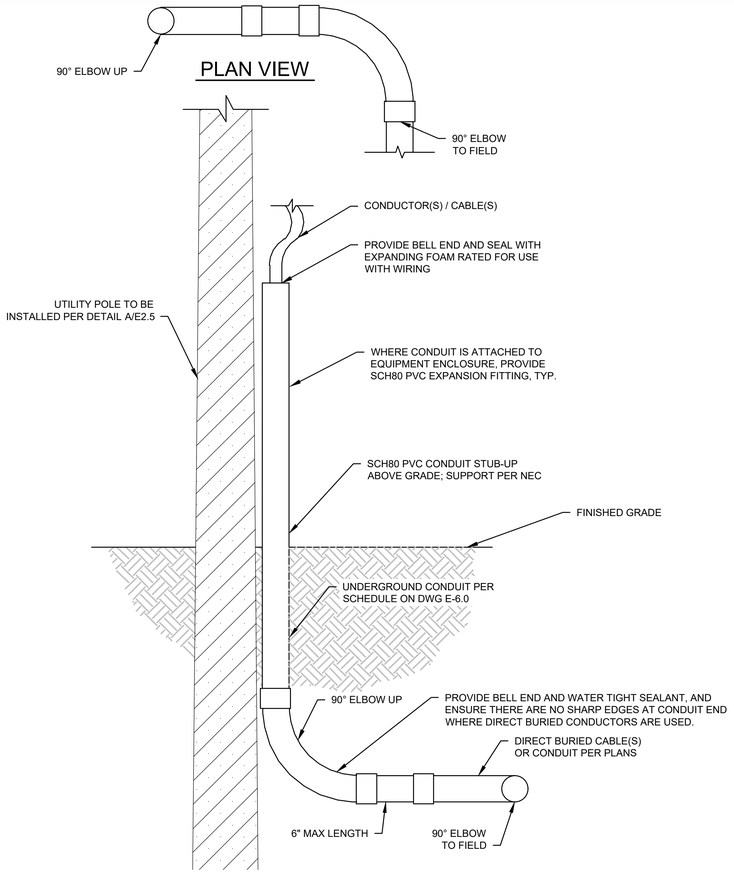
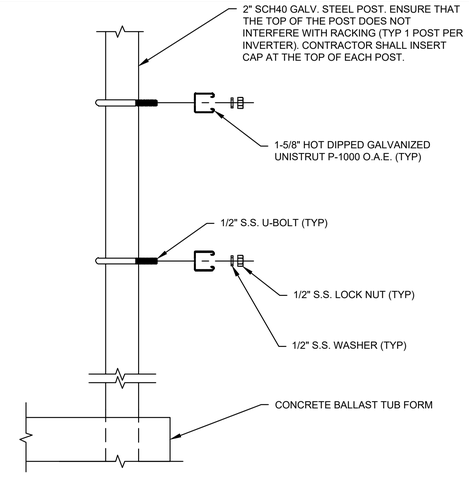


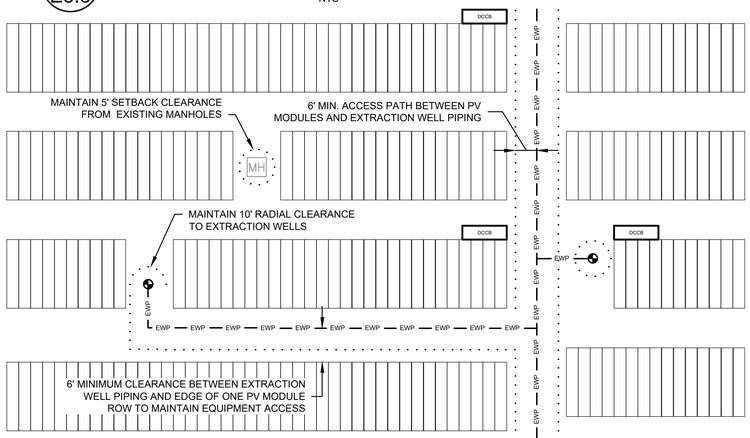
A E5.3 TYPICAL CONDUIT STUB-UP AND TRANSITION BELOW GRADE AT RISER POLE

SCALE: N.T.S.



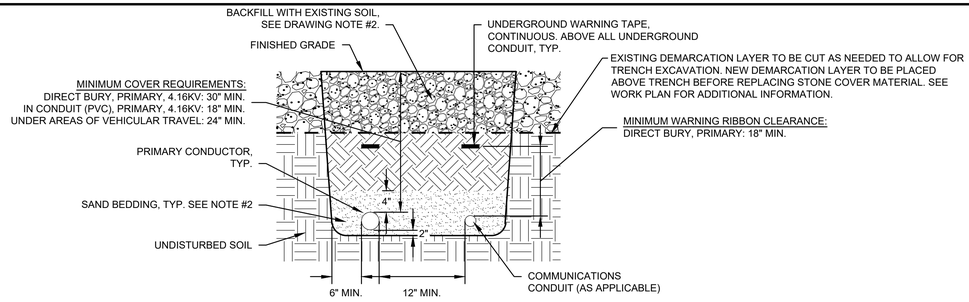
B E5.3 EQUIPMENT MOUNTING

NTS



F E5.3 EXTRACTION SYSTEM OFFSET DETAIL

SCALE: N.T.S.

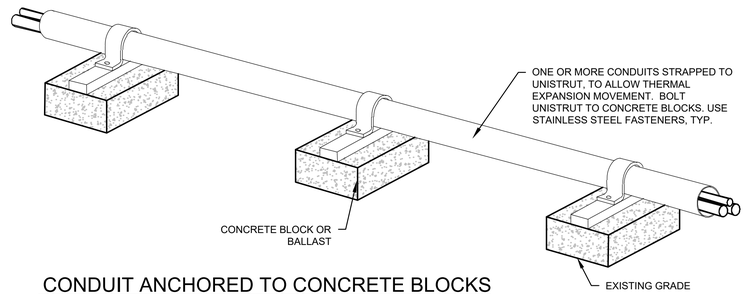


C E5.3 CONDUIT TRENCH DETAIL OFF EXTENT OF GSL LINER

SCALE: N.T.S.

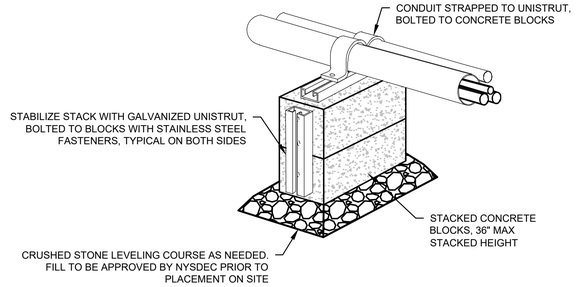
TRENCHING NOTES:

1. VEHICLE ACTIVITY AND SURFACE LOADING OVER THE BURIED CONDUIT OR CONDUCTORS SHALL NOT EXCEED THEIR RATED CRUSH TEST CAPACITY.
2. BACKFILL MATERIAL SHALL BE SPOILS FROM EXCAVATION, COMPACTED. NATIVE BACKFILL MATERIAL ONLY ACCEPTABLE IF IT CAN PASS THROUGH A 3" SCREEN. SAND BEDDING SHALL BE USED AROUND CONDUCTORS FOR PADDING, TYP.
3. THE NUMBER OF CONDUITS/CIRCUITS SHOWN IS REPRESENTATIVE AND WILL VARY PER THE PLANS AND SCHEDULES.
4. 12" MIN. CLEARANCE SHALL BE MAINTAINED BETWEEN POWER AND DATA WIRING.
5. EDGE OF TRENCH SHALL BE A MIN. OF 3' CLEAR FROM THE EDGE OF EQUIPMENT PAD UNLESS APPROVED BY E.O.R.
6. ALL CONDUIT INSTALLATION TO CONFORM TO NEC TABLE 300.5.



CONDUIT ANCHORED TO CONCRETE BLOCKS

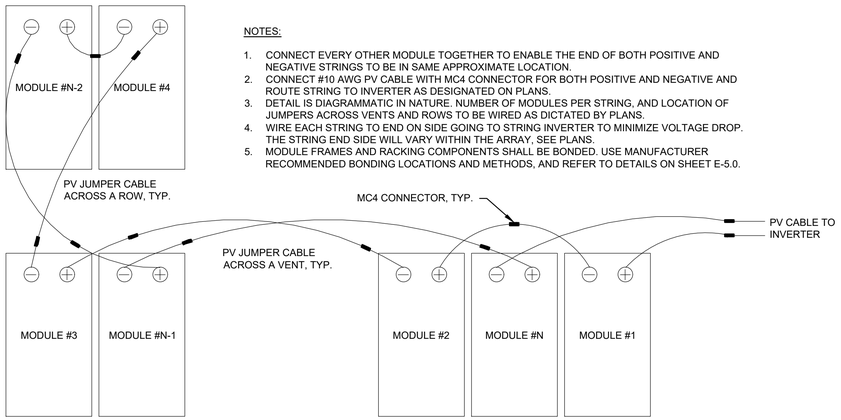
SCALE: N.T.S.



CONDUIT ANCHORED TO STACKED BLOCKS

E E5.3 CONDUIT ANCHORED TO CONCRETE BLOCKS

SCALE: N.T.S.

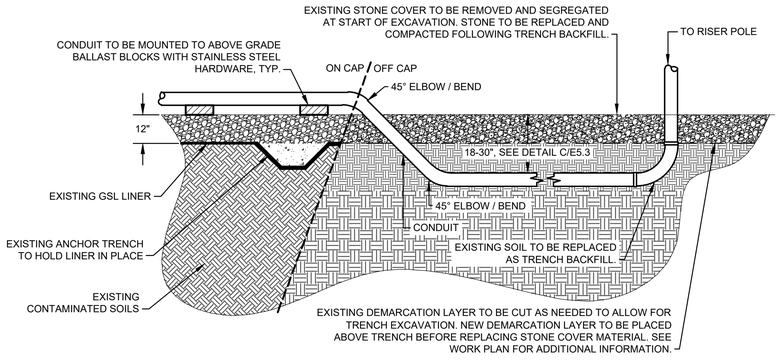


NOTES:

1. CONNECT EVERY OTHER MODULE TOGETHER TO ENABLE THE END OF BOTH POSITIVE AND NEGATIVE STRINGS TO BE IN SAME APPROXIMATE LOCATION.
2. CONNECT #10 AWG PV CABLE WITH MC4 CONNECTOR FOR BOTH POSITIVE AND NEGATIVE AND ROUTE STRING TO INVERTER AS DESIGNATED ON PLANS.
3. DETAIL IS DIAGRAMMATIC IN NATURE. NUMBER OF MODULES PER STRING, AND LOCATION OF JUMPERS ACROSS VENTS AND ROWS TO BE WIRED AS DICTATED BY PLANS.
4. WIRE EACH STRING TO END ON SIDE GOING TO STRING INVERTER TO MINIMIZE VOLTAGE DROP. THE STRING END SIDE WILL VARY WITHIN THE ARRAY, SEE PLANS.
5. MODULE FRAMES AND RACKING COMPONENTS SHALL BE BONDED. USE MANUFACTURER RECOMMENDED BONDING LOCATIONS AND METHODS, AND REFER TO DETAILS ON SHEET E-5.0.

D E5.3 STRING WIRING DETAIL, TYP.

SCALE: N.T.S.



G E5.3 CONDUIT TRENCH AT EDGE OF CAP

SCALE: N.T.S.

NOTES:

1. NO EXCAVATION SHALL OCCUR ABOVE THE GSL LINER UNLESS SPECIFICALLY NOTED.
2. SEE DETAIL C/E-5.3 ON THIS SHEET FOR TRENCHING SPECIFICATIONS.

REV #	DESCRIPTION	DATE	BY

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

MISC. ELECTRICAL DETAILS-SHEET 1

INOVATEUS SOLAR LLC
19890 State Line Road
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9/5/2024

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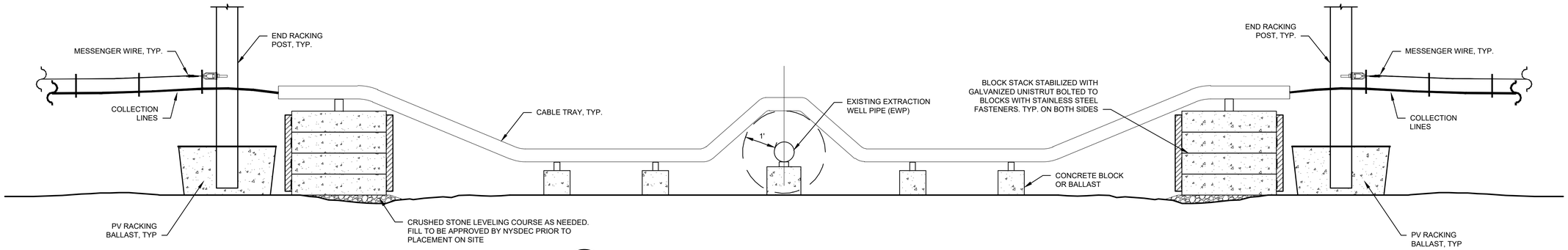
9/5/2023	DESIGNED BY: TSH	
SCALE AS SHOWN	CHECKED BY: JSC	C&A JOB# 5566.03
	APPROVED BY: JSC	DRAWING: E-5.3

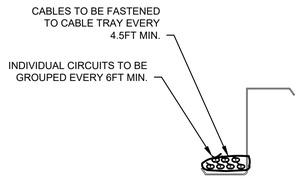


E / E5.4 EXTRACTION WELL PIPING CROSSING - SECTION VIEW

SCALE: N.T.S.

GENERAL NOTES:

1. ENCLOSURES SHOULD BE MOUNTED TO NEC STANDARDS AND IN A SHADED AREA.
2. ALL PENETRATIONS SHOULD BE MADE ON THE BOTTOM WITH WATER TIGHT CONNECTORS.
3. ONE STRAIN RELIEF COUPLING FOR EACH SENSOR WIRE RUN FREE AIR TO SENSOR WITH PROPER CABLE SECURING AND ROUTING TO INSURE A MAINTENANCE FREE LIFE.
4. FOR REMOTE WS: ONE TO CONNECT CONDUIT FOR MAIN TO REMOTE CAT 5 COMMUNICATION AND 24 VDC
5. MODULE TEMP SENSOR (BAPI BA/T1K-RPP-10'-BB2) RATED FOR -47 TO 57°C. THIS MODULE SHALL BE MOUNTED IN A SHADED AREA NEAR A MODULE. SENSOR SHOULD BE SECURED WITH CLEAR EPOXY AND FOIL TAPE IN THE MIDDLE OF A MODULE AND THE MIDDLE OF A STRING. SENSOR PROVIDED IN WEATHER PROOF MOUNTING. 2 WIRES NEED TO BE EXTENDED TO THE WEATHER STATION BOARD WITH INSTALLER SUPPLIED OUTDOOR SHIELDED CAT 5 (STP OR FTP) OR BELDEN 9842.
6. FOR THE AMBIENT TEMPERATURE SENSOR (BAPI BA/T1K-0-BB2) SHOULD BE MOUNTED IN THE SHADE NEAR THE WEATHER STATION BOARD. AMBIENT TEMPERATURE SENSOR PROVIDED IN WEATHER PROOF MOUNTING. 2 WIRES NEED TO BE EXTENDED (MAX. 30 FT) TO THE WEATHER STATION BOARD WITH INSTALLER SUPPLIED OUTDOOR SHIELDED CAT 5 (STP OR FTP) OR OR BELDEN 9842.
7. WIND SPEED AND DIRECTION ANEMOMETER SHALL BE A DAVIS 7911. MOUNTING BRACKET, SCREWS AND 1.25 INCHES U-BOLTS INCLUDED. MOUNTED TO A POLE OR STRUT 3 TO 4 FEET ABOVE SURROUNDING SURFACES. CONNECTED TO WEATHER STATION BOARD, INCLUDES 30 FEET OF CAT 5 (STP OR FTP) AND SHOULD NOT BE EXTENDED.
8. PRECISION PYRANOMETER FOR GLOBAL HORIZONTAL IRRADIATION (GHI) MEASUREMENTS SHOULD BE MOUNTED LEVEL AT THE HIGHEST POINT OF THE ARRAY. CLEAR OF ANY SHADOWS THROUGHOUT THE YEAR. IF ANY OBJECT IS HIGHER IT NEEDS TO BE GREATER THAN 10 TIMES FARTHER AWAY THAN IT IS HIGHER IN ORDER TO NOT EFFECT THE MEASUREMENT. CONNECT TO THE WEATHER STATION BOARD, 30FT CABLE IS PROVIDED AND SHOULD NOT BE EXTENDED OR CUT.

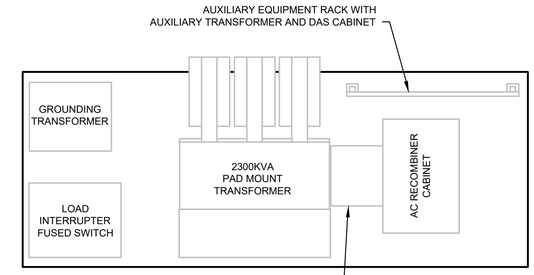


C / E5.4 CABLE TRAY DETAIL

SCALE: N.T.S.

NOTES:

1. THE CABLE TRAYS ON THE RACKING SYSTEM MAY SUPPORT THE SPECIFIED 1500V PV CABLES. WHERE AC CONDUCTORS RATED LESS THAN 1500V ARE INSTALLED IN THE SAME CABLE TRAY, THEY MUST BE SEPARATED BY A SOLID FIXED BARRIER OF MATERIAL COMPATIBLE WITH THE CABLE TRAY.
2. CABLES SHALL BE SECURED TO THE CABLE TRAY AT LEAST EVERY 4.5FT.
3. CABLES OF THE SAME CIRCUIT SHALL BE BOUND TOGETHER AT LEAST EVERY 6FT.
4. WHERE CABLES ENTER AND EXIT THE CABLE TRAY, THEY SHALL BE SECURED SO AS TO PREVENT STRESS ON CABLES. CABLES SHALL BE ROUTED IN A STRAIGHT PATH FROM PANEL CONNECTION TO FASTENER ON CABLE TRAY WHILE MAINTAINING A MINIMUM BEND RADIUS PER THE MANUFACTURER'S SPECIFICATIONS. LOOSE SECTIONS OF CABLE SHALL NOT BE PERMITTED.
5. ON ROWS CONTAINING MORE THAN (4) STRINGS, PV CABLES SHALL BE DISTRIBUTED TO UTILIZE EACH OF THE (4) CABLE TRAYS PROVIDED BY THE RACKING SYSTEM.

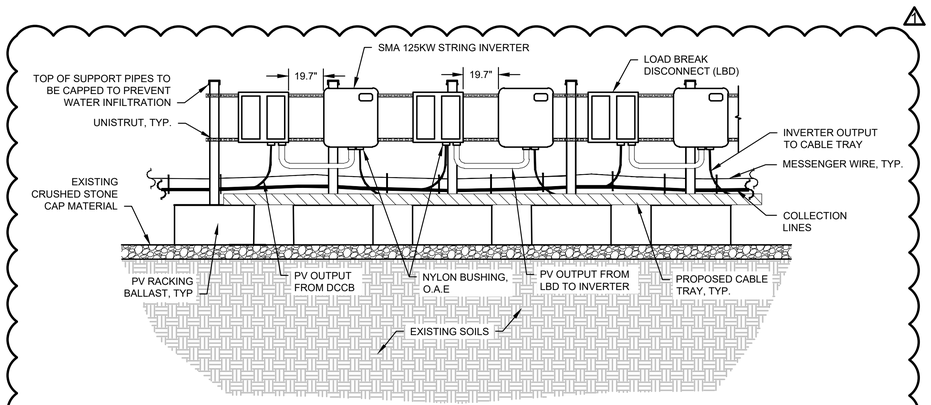


A / E-5.4 TYPICAL EQUIPMENT PAD PLAN VIEW

SCALE: N.T.S.

NOTES:

1. EQUIPMENT LAYOUT IS DIAGRAMMATIC IN NATURE, PAD LAYOUT DEPENDANT ON SKID DESIGN.
2. PAD MOUNT TRANSFORMER AND GROUNDING TRANSFORMER DIMENSIONS WILL BE UPDATED WHEN SCHEMATICS ARE AVAILABLE.

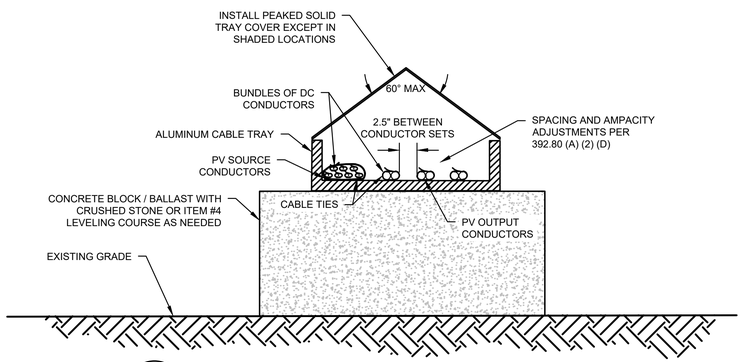


B / E5.4 INVERTER MOUNTING SYSTEM DETAIL

SCALE: N.T.S.

NOTES:

1. SUPPORT PIPES TO SHARE CONCRETE RACKING BALLASTS WHEN POSSIBLE. ADDITIONAL BALLASTS TO BE ADDED AS REQUIRED.
2. INVERTERS TO BE SPACED 12" MINIMUM FROM BACK OF RACKING POSTS.
3. SEE CONDUCTOR SCHEDULES ON SHEETS E-6.5 AND E-6.6 FOR DETAILS ON CONDUIT SIZING.



D / E5.4 ABOVE GRADE ELECTRIC IN CABLE TRAY

SCALE: N.T.S.

REV #	DESCRIPTION	DATE	BY
1	INVERTER RACK DETAIL UPDATES	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

MISC. ELECTRICAL DETAILS-SHEET 2

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LICENSED PROFESSIONAL ENGINEER — JENNIFER SUZANNE CRAWFORD — STATE OF NEW YORK — 150556

9/5/2024

DATE	9/5/2023	DRAWN BY:	TSH
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		CHECKED BY:	JSC
		APPROVED BY:	JSC

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C&A JOB# 5566.03

DRAWING: E-5.4

PHOTOVOLTAIC SYSTEM LABELS		
LABEL ID	DESCRIPTION	LABEL LOCATION
1	*LEAD WIRES SHALL HAVE POLARITY MARKING OVERCURRENT PROTECTION = 30A OPEN-CIRCUIT VOLTAGE = 49.81VDC RATED VOLTAGE = 41.8VDC MAXIMUM SYSTEM VOLTAGE =1500VDC RATED CURRENT = 13.04A SHORT CIRCUIT CURRENT = 13.92A RATED MAXIMUM POWER = 545W	PV MODULES
2	ELK STREET SOLAR - ROW __ ⚠1	PERMANENTLY AFFIXED TO THE OUTERMOST RACKING POST OF EACH ROW, FACING THE ROW ACCESS POINT . LABELS SHALL BE BLUE BACKGROUND WITH WHITE CAPITAL LETTERS
3	INVERTER ___ STRING ___ (+ / -)	PERMANENTLY AFFIXED TO THE BOTTOM OF THE MODULE AT THE BEGINNING/END OF EACH STRING TO IDENTIFY EACH DC HOMERUN. NEGATIVE HOMERUN LABELS SHALL BE BLACK WITH WHITE CAPITAL LETTERS, POSITIVE LABELS SHALL BE RED WITH WHITE CAPITAL LETTERS. EACH LABEL SHALL INCLUDE THE CORRECT POLARITY MARKING (+ OR -)
4	WARNING ELECTRIC SHOCK HAZARD. THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED.	ALL UNGROUNDED JUNCTION BOXES, COMBINER BOXES, AND DISCONNECTS. LABELS SHALL BE REFLECTIVE ORANGE BACKGROUND WITH BLACK CAPITAL LETTERS
5	PHOTOVOLTAIC SYSTEM DC DISCONNECT MAXIMUM RATED POWER POINT CURRENT: 182.6A-DC MAXIMUM RATED POWER POINT VOLTAGE: 1086.8V-DC MAXIMUM RATED SYSTEM CURRENT: 214.4A-DC MAXIMUM RATED SYSTEM VOLTAGE:1460.1 V-DC	DC DISCONNECTS INCLUDING DCCB-1 THROUGH DCCB-7 AND LBD-1 THROUGH LBD-7. LABELS SHALL BE RED BACKGROUND WITH WHITE CAPITAL LETTERS
6	PHOTOVOLTAIC SYSTEM DC DISCONNECT MAXIMUM RATED POWER POINT CURRENT: 169.5A-DC MAXIMUM RATED POWER POINT VOLTAGE: 1086.8V-DC MAXIMUM RATED SYSTEM CURRENT: 199.1A-DC MAXIMUM RATED SYSTEM VOLTAGE:1460.1 V-DC	DC DISCONNECTS INCLUDING DCCB-8 THROUGH DCCB-19 AND LBD-8 THROUGH LBD-19. LABELS SHALL BE RED BACKGROUND WITH WHITE CAPITAL LETTERS
7	WARNING! ELECTRIC SHOCK HAZARD - TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION.	ALL DC DISCONNECTS WHERE LINE AND LOAD TERMINALS MAY BE ENERGIZED IN THE OPEN (OFF) POSITION. LABELS SHALL BE REFLECTIVE ORANGE BACKGROUND WITH BLACK CAPITAL LETTERS
8	PHOTOVOLTAIC GENERATOR DISCONNECT SWITCH	UTLITY DISCONNECT POLE (SEE LABELS C AND D ON SHEET E-5.6)
8B	PHOTOVOLTAIC GENERATOR DISCONNECT IS LOCATED AT CUSTOMER POLE "C-1"	UTILITY METER POLE
9	PHOTOVOLTAIC GENERATOR DISCONNECT WARNING DUAL POWER SOURCE SECOND SOURCE IS A PV SYSTEM MAX OPERATING CURRENT: 331.0A MAX OPERATING VOLTAGE: 4.16KV	AT POINT OF INTERCONNECTION TO EXISTING SYSTEM. LABELS SHALL BE REFLECTIVE ORANGE BACKGROUND WITH BLACK CAPITAL LETTERS (SEE LABEL B ON SHEET E-5.6)

PHOTOVOLTAIC SYSTEM LABELS		
LABEL ID	DESCRIPTION	LABEL LOCATION
10	A PERMANENT PLAQUE INDICATED LOCATION OF ALL ELECTRIC POWER SOURCES ON OR IN THE PREMISES	ALL SERVICE EQUIPMENT AND AC DISCONNECTS AT INTERCONNECTION EQUIPMENT PADS.PLAQUES SHALL BE BLUE BACKGROUND WITH WHITE CAPITAL LETTERS (SEE LABEL A ON SHEET E-5.6)
11	LABELS ON ALL ELECTRICAL EQUIPMENT INSTALLED AS PART OF THE SOLAR INSTALLATION, CORRESPONDING TO THE LABELS ON E-6.0 AND E-6.2	ALL INVERTERS, COMBINERS, AND DISCONNECTS. LABELS SHALL BE BLUE BACKGROUND WITH WHITE CAPITAL LETTERS

NOTES:
1. SEE SHEETS E-5.6 AND E-5.7 FOR ADDITIONAL EQUIPMENT LABELING REQUIREMENTS.
2. FLASH HAZARD BOUNDARY, CAL/CM2 AND APPROACH BOUNDARY LABELS TO BE PROVIDED BY E.O.R. THROUGH ETAP PENDING FINAL ARC FLASH ANALYSIS REPORT.
3. ALL SIGNAGE AND LABELS TO BE COMPLIANT WITH NFPA70-110.20, ANSI Z535.4 AND UL969
4. LABEL & TEXT SIZES SHOWN ARE ENGINEERING RECOMMENDATIONS. SIZES ARE PERMITTED TO BE ADJUSTED. FINAL LABELS MUST BE LEGIBLE AND MEET ALL CODE REQUIREMENTS.

REV #	DESCRIPTION	DATE	BY
1	ROW LABEL UPDATE	3/22/24	ESA

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

SYSTEM SIGNAGE AND LABELING - SHEET 1

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

STATE OF NEW YORK · JENNIFER SUZANNE CRAWFORD · LICENSED PROFESSIONAL ENGINEER · 120556 · 3/22/2024

DATE	9/5/2023	DRAWN BY:	TSH
SCALE	AS SHOWN	DESIGNED BY:	TSH
		CHECKED BY:	JSC
		APPROVED BY:	JSC

N:\WORK\5566.02 Elk Street\DWG\5566.02 DETAILS.dwg

C&A JOB# 5566.03

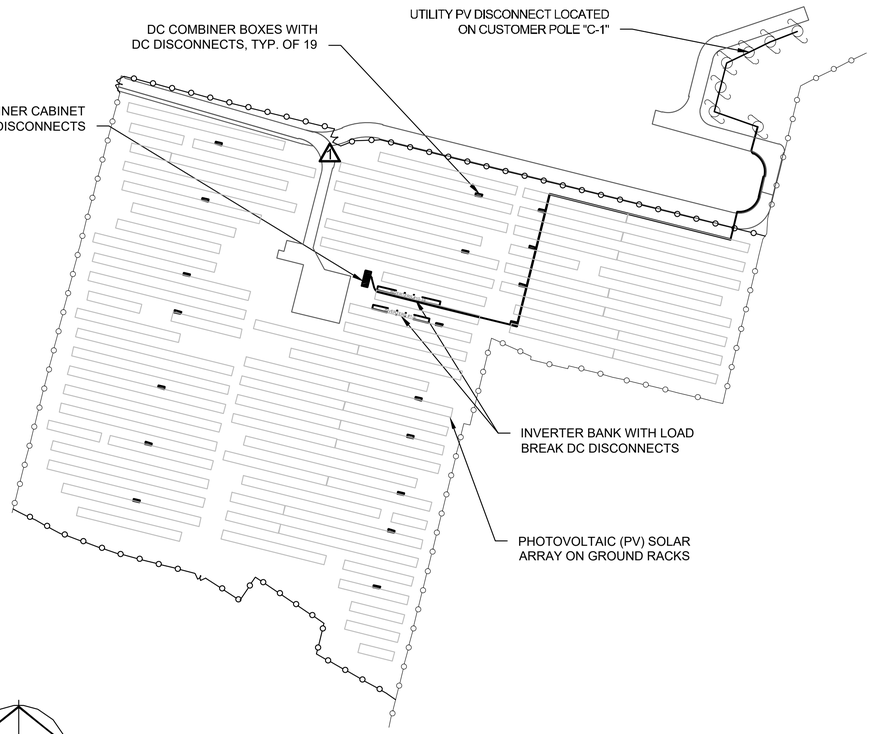
DRAWING: E-5.5

CAUTION

POWER IS SUPPLIED
FROM THE FOLLOWING SOURCES WITH
DISCONNECTS LOCATED AS SHOWN.

3/4" (TYP)

1/4" (TYP)



APPROX
NORTH

503 ELK STREET
BUFFALO, NY 14210

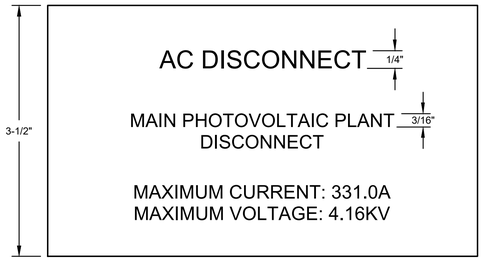
MAP OF POWER SOURCE
DISCONNECTING MEANS

1/4" (TYP)

1'0"

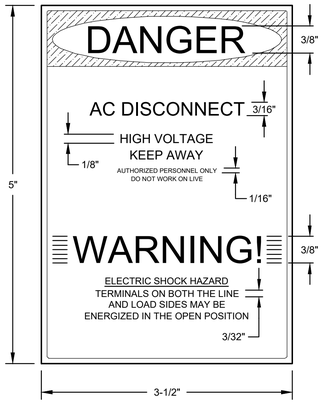
TO BE INSTALLED AT:
- PV SYSTEM AC SERVICE DISCONNECTING MEANS
- UTILITY MAIN SERVICE DISCONNECTING MEANS
- MAIN SITE ACCESS GATE

A / E5.6 FACILITIES WITH UTILITY SERVICES AND PV SYSTEMS DIRECTORY NTS



NOTES:
1. LABEL TO BE INSTALLED AT POLE "C-1"

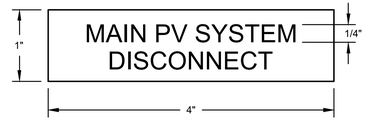
B / E5.6 INTERACTIVE SYSTEM POI LABEL NTS



NOTES:
1. LABEL TO BE INSTALLED AT POLE "C-1"

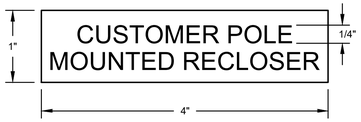
C / E5.6 PV SYSTEM DISCONNECTING MEANS LABEL NTS

NOTES:
1. SEE SHEETS E-5.5 AND E-5.7 FOR ADDITIONAL EQUIPMENT LABELING REQUIREMENTS.
2. FLASH HAZARD BOUNDARY, CAL/CM2 AND APPROACH BOUNDARY LABELS TO BE PROVIDED BY E.O.R. THROUGH ETAP PENDING FINAL ARC FLASH ANALYSIS REPORT.
3. ALL SIGNAGE AND LABELS TO BE COMPLIANT WITH NFPA70-110.20, ANSI Z535.4 AND UL969
4. LABEL & TEXT SIZES SHOWN ARE ENGINEERING RECOMMENDATIONS. SIZES ARE PERMITTED TO BE ADJUSTED. FINAL LABELS MUST BE LEGIBLE AND MEET ALL CODE REQUIREMENTS.



NOTES:
1. LABEL TO BE INSTALLED AT POLE "C-1"

D / E5.6 MAIN DISCONNECT EQUIPMENT LABEL NTS



NOTES:
1. LABEL TO BE INSTALLED AT POLE "C-1"

E / E5.6 CUSTOMER RECLOSER EQUIPMENT LABEL NTS

REV #	DESCRIPTION	DATE	BY
1	UPDATED LAYOUT	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

SYSTEM SIGNAGE AND
LABELING - SHEET 2

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

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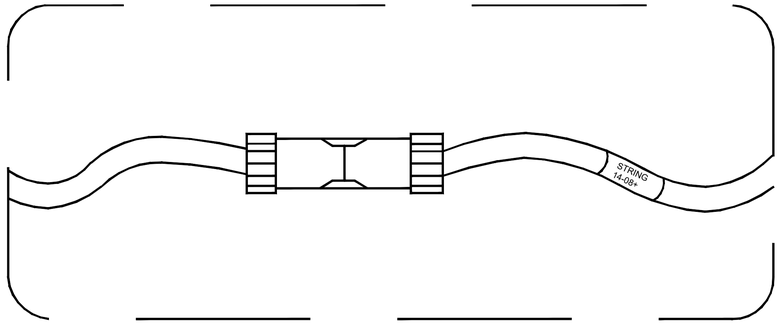
STATE OF NEW YORK · JENNIFER SUZANNE CRAWFORD · LICENSED PROFESSIONAL ENGINEER · 150556 · 3/22/2024

IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON TO ALTER THESE DOCUMENTS IN ANY WAY, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

DATE	DRAWN BY: TSH	H:\WORK\5566.02 Elk Street\DWG\5566.02 DETAILS.dwg
9/5/2023	DESIGNED BY: TSH	
SCALE	CHECKED BY: JSC	C&A JOB#
AS SHOWN	APPROVED BY: JSC	5566.03

DRAWING: E-5.6



A E5.7 STRING WIRE LABEL

SCALE: N.T.S.

B E5.7 CONDUIT LABEL

SCALE: N.T.S.

⚠ WARNING

HAZARDOUS VOLTAGE INSIDE

FOR YOUR SAFETY

-KEEP OUT-

CAN SHOCK, BURN, OR CAUSE DEATH

AUTHORIZED PERSONNEL ONLY

C E5.7 FENCE LABEL

SCALE: N.T.S.

NOTES:
1. SEE SHEETS E-5.5 AND E-5.6 FOR ADDITIONAL EQUIPMENT LABELING REQUIREMENTS.
2. FLASH HAZARD BOUNDARY, CAL/CM2 AND APPROACH BOUNDARY LABELS TO BE PROVIDED BY E.O.R. THROUGH ETAP PENDING FINAL ARC FLASH ANALYSIS REPORT.
3. ALL SIGNAGE AND LABELS TO BE COMPLIANT WITH NFPA70-110.20, ANSI Z535.4 AND UL969
4. CONDUIT LABEL TO BE PERMANENTLY AFFIXED TO RACEWAYS, CABLE TRAYS, AND JUNCTION BOXES THAT CONTAIN PV CONDUCTORS EVERY 10'. LABEL TO BE REFLECTIVE WITH RED BACKGROUND AND LETTERS WITH A MINIMUM HEIGHT OF 3/8".

REV #	DESCRIPTION	DATE	BY

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

SYSTEM SIGNAGE AND LABELING - SHEET 3

INOVATEUS SOLAR LLC
19890 State Line Road
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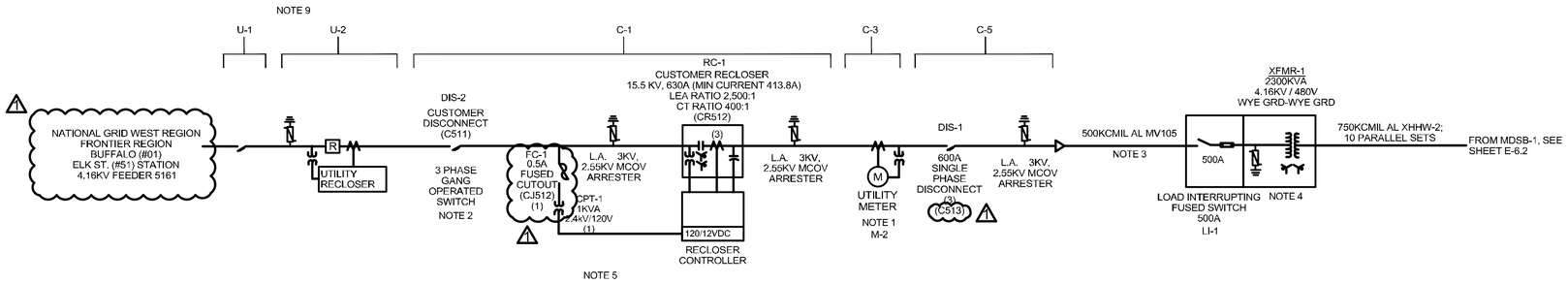
STATE OF NEW YORK · LICENSED · JENNIFER SUZANNE CRAWFORD · PROFESSIONAL ENGINEER · 120556

9/5/2024

DATE	DRAWN BY: TSB	N:\WORK\5566.02 Elk Street\DWG\5566.02 DETAILS.dwg
9/5/2023	DESIGNED BY: TSB	
SCALE	CHECKED BY: JSC	C&A JOB# 5566.03
AS SHOWN	APPROVED BY: JSC	DRAWING: E-5.7



SMA SUNNY HIGHPOWER PEAK3 125-US

NOMINAL APPARENT POWER AC	125 KVA
RATED OUTPUT POWER AC	125 KW
OPERATING VOLTAGE	480 V
ELECTRICAL SERVICE	3 AC 480V WYE + N
MAX CONTINUOUS CURRENT	151 RMS
PEAK EFFICIENCY	98.5%
WEIGHTED EFFICIENCY	98%
REGULATORY COMPLIANCE	UL 1741SB, IEEE 1547(2018)

SYSTEM CAPACITY

NUMBER OF INVERTERS	19 (NOTE 8)
TOTAL CAPACITY (AC)	2300 KVA/ 2300KW (NOTE 8)
TOTAL CAPACITY (DC)	3,599 KW
MODULE WATTAGE/QTY	545W/ 6,604

DRAWING NOTES:

1. EPC TO SUPPLY POLE MOUNTED METERING EQUIPMENT PER UTILITY SPECIFICATIONS.
2. SIGNAGE TO INCLUDE "PHOTOVOLTAIC SYSTEM AC DISCONNECT SWITCH" DISCONNECTING MEANS SHALL BE INSTALLED AT A READILY ACCESSIBLE LOCATION. DISCONNECT TO BE A 900A (MINIMUM CURRENT RATING TO BE AT LEAST 413.8A), 15KV GANG OPERATED DISCONNECT THAT CAN BE LOCKED IN THE OPEN POSITION.
3. 5KV CABLE TO BE IN CONDUIT. MV-105 WITH 133% INSULATION LEVEL AND FULL CONCENTRIC NEUTRAL.
4. TRANSFORMER TO BE 5-LEGGED CORE CONSTRUCTION, 5.75%Z, Z/R=8 AND DESIGNED FOR STEP UP OPERATION.
5. THE RECLOSER TO BE A G&W VIPER RECLOSER WITH 5V MAX LEA (PT) RATIO OF 2,500:1 AND CT RATIO OF 400:1. THE RECLOSER CONTROLLER TO BE A SEL-651R2 AND WILL OPEN THE RECLOSER FOR THE INDICATED SYSTEM CONDITIONS. THE SEL651R WILL ALSO PROVIDE FAIL SAFE CONTROLS BY TRIPPING FOR LOSS OF AC POWER AND BTFAIL (12VDC BATTERY AND/OR TEST FAILURE) CONDITIONS. THE RECLOSER WILL PROVIDE OPEN PHASE PROTECTION AND RECLOSING WILL BE ALLOWED ONCE VOLTAGE AND FREQUENCY IS RESTORED TO NORMAL LEVELS.
6. C-1 TO INCLUDE THE CUSTOMER OWNED GOAB AND THE CUSTOMER OWNED RECLOSER, C-3 TO INCLUDE THE UTILITY OWNED METER, C-5 TO INCLUDE THE DISCONNECT AND RISER. U-2 TO BE UTILITY OWNED AND TO INCLUDE UTILITY OWNED RECLOSER. POLES TO BE LOCATED 20 FT APART.
7. CONDUCTOR SIZES AND EQUIPMENT RATINGS TO BE REVIEWED BY EOR PRIOR TO CONSTRUCTION, PENDING FINAL EQUIPMENT SUBMITTALS BY INOVATEUS SOLAR, LLC.
8. PROJECT TO BE SOFTWARE LIMITED TO 2300KW AT THE POI BY LIMITING INVERTER #1-10 TO 121.1KW AND #11-19 TO 121.0KW.
9. U-1 AND U-2 TO BE INSTALLED BY THE UTILITY.

INTERCONNECTION SINGLE LINE DIAGRAM

WIRE AND CONDUIT SCHEDULE - INTERCONNECTION

FROM	TO	COMMENT	# OF PHASE COND.	PHASE & NEUTRAL WIRE TYPE	# OF PARALLEL SETS	MIN. PHASE WIRE SIZE	ESTIMATED ONE-WAY DISTANCE (MAX, FEET)	VOLTAGE DROP[1] (%)	MIN. NEUTRAL WIRE SIZE	EQUIPMENT GROUNDING CONDUCTOR (CU)	SHALLOW BURIED ON LANDFILL/ABOVE GROUND CONDUIT TYPE	NORMAL BURIAL DEPTH CONDUIT TYPE	CONDUIT SIZE[3]
XFMR-1	LBD	AC INTERCONNECT CIRCUIT	3	MV-105 (AL, FULL CONCENTRIC NEUTRAL, 15KV 133%)	2	250	10	0.01%	N/A	N/A	N/A	PVC	6"[2]
LBD	C-5	AC INTERCONNECT CIRCUIT	3	MV-105 (AL, FULL CONCENTRIC NEUTRAL, 15KV 133%)	2	250	950	0.50%	N/A	N/A	RMC	PVC	6"[2]
C-5	C-4	AC INTERCONNECT CIRCUIT	3	ACSR	1	WAXWING	75	0.11%	WAXWING	#2	N/A	N/A	N/A
C-4	C-3	AC INTERCONNECT CIRCUIT	3	ACSR	1	WAXWING	40	0.06%	WAXWING	#2	N/A	N/A	N/A
C-3	C-2	AC INTERCONNECT CIRCUIT	3	ACSR	1	WAXWING	40	0.06%	WAXWING	#2	N/A	N/A	N/A
C-2	C-1	AC INTERCONNECT CIRCUIT	3	ACSR	1	WAXWING	40	0.06%	WAXWING	#2	N/A	N/A	N/A
C-1	U-2	AC INTERCONNECT CIRCUIT	3	ACSR	1	WAXWING	40	0.06%	WAXWING	#2	N/A	N/A	N/A
U-2	U-1	BY UTILITY	3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NOTES:
1. AC VOLTAGE DROP CALCULATIONS ASSUME POWER FACTOR = 1.
2. CIRCUIT MAY BE SEPARATED INTO PARALLEL CONDUITS OF A SMALLER SIZE.
3. CONDUCTORS ARE ASSUMED TO BE IN MSW UNLESS OTHERWISE NOTED ON SITE PLAN.

REV #	DESCRIPTION	DATE	BY
1	UPDATES PER NATIONAL GRID COMMENTS	3/5/24	ESA

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

INTERCONNECTION
SINGLE LINE DIAGRAM

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

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4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
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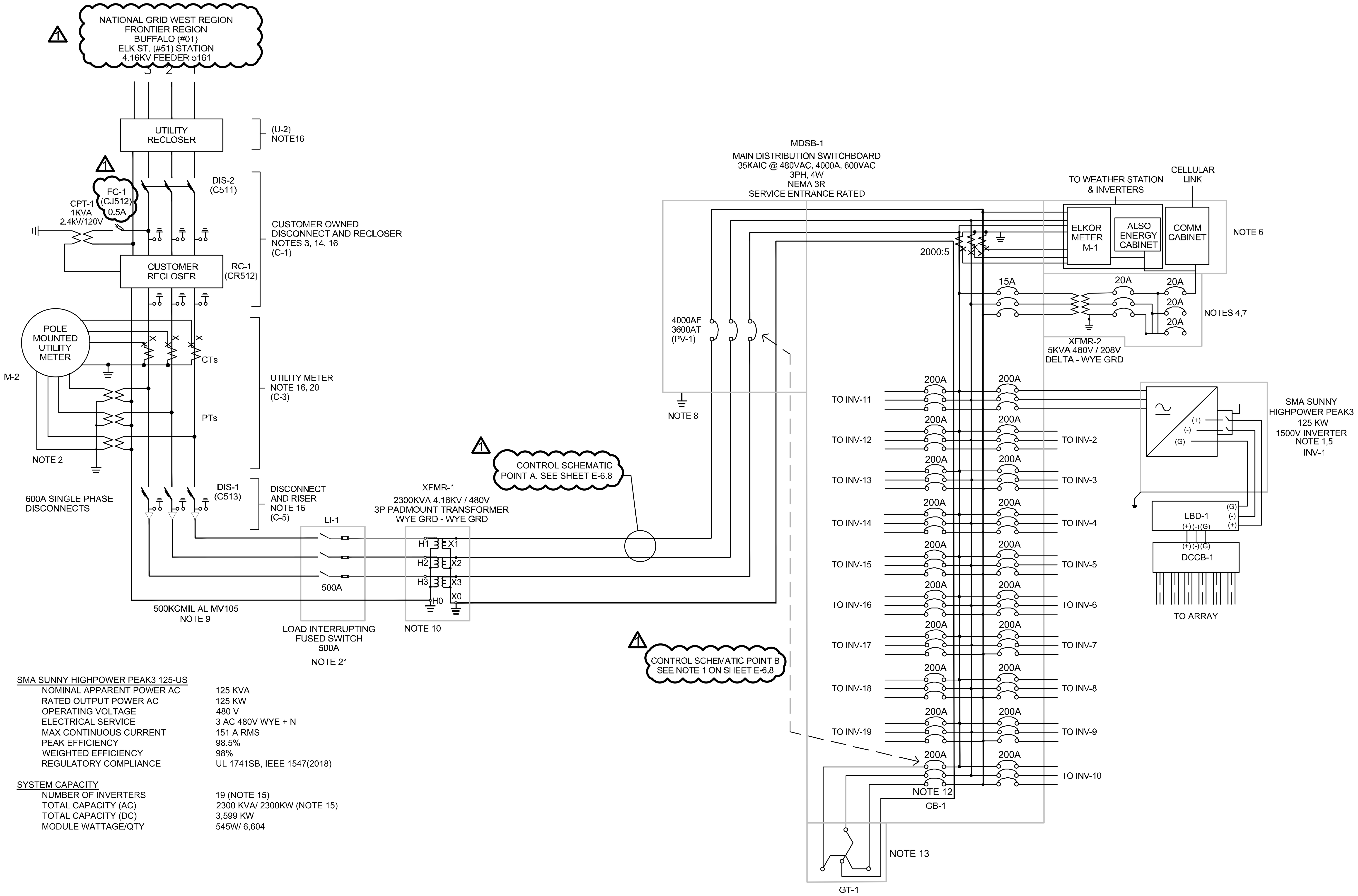
STATE OF NEW YORK — JENNIFER SUZANNE CRAWFORD — LICENSED PROFESSIONAL ENGINEER — 150556 — 9/5/2024

DATE	9/5/2023	DRAWN BY: TSB, JAT, ESA	N:\WORK\5566.02 Elk Street\DWG\5566.02 SCHEDULES AND DIAGRAMS.dwg
SCALE	AS SHOWN	DESIGNED BY: TSB, JAT	
		CHECKED BY: TSB, JSC	C&A JOB# 5566.03
		APPROVED BY: JSC	DRAWING: E-6.0



SYSTEM THREE LINE DIAGRAM

SMA SUNNY HIGHPOWER PEAK3 125-US

NOMINAL APPARENT POWER AC	125 KVA
RATED OUTPUT POWER AC	125 KW
OPERATING VOLTAGE	480 V
ELECTRICAL SERVICE	3 AC 480V WYE + N
MAX CONTINUOUS CURRENT	151 A RMS
PEAK EFFICIENCY	98.5%
WEIGHTED EFFICIENCY	98%
REGULATORY COMPLIANCE	UL 1741SB, IEEE 1547(2018)

SYSTEM CAPACITY

NUMBER OF INVERTERS	19 (NOTE 15)
TOTAL CAPACITY (AC)	2300 KVA/ 2300KW (NOTE 15)
TOTAL CAPACITY (DC)	3,599 KW
MODULE WATTAGE/QTY	545W/ 6,604

DRAWING NOTES:

1. THE INVERTERS WILL AUTOMATICALLY DE-ENERGIZE THE OUTPUTS IF THE UTILITY GRID IS REMOVED AND WILL NOT RE-ENERGIZE FOR 5 MINUTES AFTER ACCEPTABLE UTILITY VOLTAGE LEVELS ARE ESTABLISHED.
2. EPC TO SUPPLY POLE MOUNTED METERING EQUIPMENT PER UTILITY SPECIFICATIONS.
3. SIGNAGE TO INCLUDE "PHOTOVOLTAIC SYSTEM AC DISCONNECT SWITCH" DISCONNECTING MEANS SHALL BE INSTALLED AT A READILY ACCESSIBLE LOCATION. DISCONNECT TO BE A 900A, 15KV GANG OPERATED DISCONNECT THAT CAN BE LOCKED IN THE OPEN POSITION.
4. LIGHTS AND 120V GFI OUTLETS TO BE INCLUDED IN SWITCHPAD.
5. WIRES TO INVERTERS WILL BE 3W, 1GRD. SIZE TO BE DETERMINED BASED ON FINAL PANEL LAYOUT FOR VOLTAGE DROP CONSIDERATIONS.
6. WEATHER STATION, PV METER AND TELECOMMUNICATIONS EQUIPMENT TO BE MOUNTED IN NEMA 3R PANEL AND MOUNTED TO SWITCHBOARD. POWER TO BE SUPPLIED FROM MINI POWER ZONE.
7. 120V POWER TO BE FED FROM SQUARE D MINI POWER ZONE (MPZ5S40F) OR EQUIVALENT.
8. THE GROUND GRID WILL BE CONSTRUCTED OF 4/0 BARE CONDUCTOR WITH A MAXIMUM RESISTANCE TO GROUND OF 5 OHMS.
9. 5KV CABLE TO BE IN CONDUIT. MV-105 WITH 133% INSULATION LEVEL AND FULL CONCENTRIC NEUTRAL.
10. TRANSFORMER AS-BUILT TO BE TRIPLEX CORE, 5.75%Z, Z/R=8 AND DESIGNED FOR STEP UP OPERATION.
11. MAIN BREAKER AS-BUILT TO BE 100% RATED.
12. GB-1 BREAKER AS-BUILT WILL BE A SQUARE D J FRAME TYPE BREAKER WITH AUXILIARY CONTACTS. PV-1 BREAKER WILL BE INTERLOCKED TO TRIP WHEN THE GB-1 BREAKER IS OPEN.
13. GROUNDING TRANSFORMER AS-BUILT TO BE A 3 PHASE ZIG-ZAG 119.3KVA GROUNDING TRANSFORMER RATED FOR 430A NEUTRAL CURRENT, 144A PHASE CURRENT, X/R OF 4, ZERO SEQ IMPEDANCE (ZG) OF 0.10 OHMS AND SHORT CIRCUIT RATING OF 6143A.
14. THE RECLOSER AS-BUILT TO BE A G&W VIPER RECLOSER WITH 5V MAX LEA (PT) RATIO OF 2,500:1 AND CT RATIO OF 400:1. THE RECLOSER CONTROLLER TO BE A SEL-651R2 AND WILL OPEN THE RECLOSER FOR THE INDICATED SYSTEM CONDITIONS. THE SEL651R WILL ALSO PROVIDE FAIL SAFE CONTROLS BY TRIPPING FOR LOSS OF AC POWER AND BTFAIL (12VDC BATTERY AND/OR TEST FAILURE) CONDITIONS. THE RECLOSER WILL PROVIDE OPEN PHASE PROTECTION AND RECLOSING WILL BE ALLOWED ONCE VOLTAGE AND FREQUENCY IS RESTORED TO NORMAL LEVELS.
15. PROJECT TO BE SOFTWARE LIMITED TO 2300KW AT THE POI BY DERATING INVERTERS #1-10 TO 121.1KW AND #11-19 TO 121.0KW. A LETTER FROM THE MANUFACTURER IS REQUIRED SHOWING INVERTERS ARE DERATED.
16. C-1 TO INCLUDE THE CUSTOMER OWNED GOAB AND THE CUSTOMER OWNED RECLOSER, C-3 TO INCLUDE THE UTILITY OWNED METER, C-5 TO INCLUDE THE DISCONNECT AND RISER. U-2 TO BE UTILITY OWNED AND TO INCLUDE UTILITY OWNED RECLOSER.
17. THREE LINE DIAGRAM BASED ON UTILITY COORDINATION DRAWING TITLED "THREE LINE UTILITY INTERCONNECTION", REVISION NUMBER 6, DATED JANUARY 13, 2022 BY JEM ENGINEERING SERVICES, LLC.
18. CONDUCTOR SIZES AND EQUIPMENT RATINGS TO BE REVIEWED BY EOR PRIOR TO CONSTRUCTION, PENDING FINAL EQUIPMENT SUBMITTALS BY INOVATEUS SOLAR, LLC.
19. BIFACIAL GAIN ASSUMED TO BE 12%.
20. UTILITY METER CT AND PT RATIOS TO BE PROVIDED BY THE UTILITY.
21. FINAL COORDINATION ANALYSIS TO BE REVIEWED UPON RECEIPT OF FUSE SPECIFICATIONS.
22. XFMR-1 AND GT-1 ARE SPACED 3 FT APART ON THE EQUIPMENT PAD.

REV #	DESCRIPTION	DATE	BY
1	UPDATES PER NATIONAL GRID COMMENTS	3/5/24	ESA

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

SYSTEM THREE LINE DIAGRAM

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

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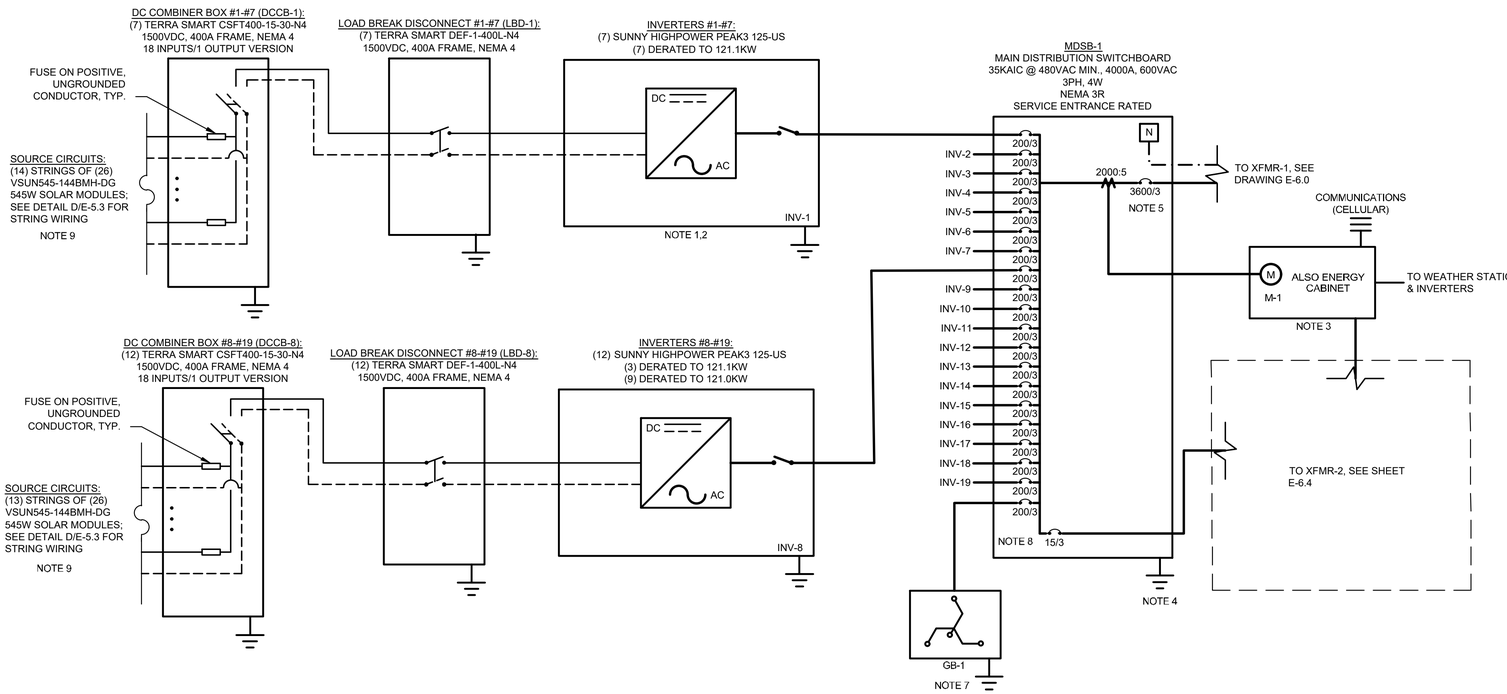
STATE OF NEW YORK ★ JENNIFER SUZANNE CRAWFORD ★ LICENSED PROFESSIONAL ENGINEER 100566
3/22/2024

DATE 9/5/2023	DRAWN BY: TSB, JAT, ESA	H:\WORK\5566.02 Elk Street\DWG\5566.02 SCHEDULES AND DIAGRAMS.dwg	
	DESIGNED BY: TSB, JAT	C&A JOB# 5566.03	DRAWING: E-6.1
SCALE AS SHOWN	CHECKED BY: TSB, JSC		
	APPROVED BY: JSC		



LEGEND

- DC POWER - POSITIVE
- DC POWER - NEGATIVE
- AC POWER, 3 PHASE

DRAWING NOTES:

1. THE INVERTERS WILL AUTOMATICALLY DE-ENERGIZE THE OUTPUTS IF THE UTILITY GRID IS REMOVED AND WILL NOT RE-ENERGIZE FOR 5 MINUTES AFTER ACCEPTABLE UTILITY VOLTAGE LEVELS ARE ESTABLISHED.
2. WIRES TO INVERTERS WILL BE 3W, 1GRD. SIZE TO BE DETERMINED BASED ON FINAL PANEL LAYOUT FOR VOLTAGE DROP CONSIDERATIONS.
3. WEATHER STATION, PV METER AND TELECOMMUNICATIONS EQUIPMENT TO BE MOUNTED IN NEMA 3R PANEL AND MOUNTED TO SWITCHBOARD. POWER TO BE SUPPLIED FROM MINI POWER ZONE.
4. THE GROUND GRID WILL BE CONSTRUCTED OF 4/0 BARE CONDUCTOR WITH A MAXIMUM RESISTANCE TO GROUND OF 5 OHMS.
5. MAIN BREAKER TO BE 100% RATED.
6. GB-1 BREAKER WILL BE A SQUARE D J FRAME TYPE BREAKER WITH AUXILIARY CONTACTS. PV-1 BREAKER WILL BE INTERLOCKED TO TRIP WHEN THE GB-1 BREAKER IS OPEN.
7. GROUNDING TRANSFORMER TO BE A 3 PHASE ZIG-ZAG 119.3KVA GROUNDING TRANSFORMER RATED FOR 430A NEUTRAL CURRENT, 144A PHASE CURRENT, X/R OF 4, ZERO SEQ IMPEDANCE (ZG) OF 0.10 OHMS AND SHORT CIRCUIT RATING OF 6143A.
8. PROJECT TO BE SOFTWARE LIMITED TO 2300KW AT THE POI BY LIMITING INVERTER #1-10 TO 121.1KW AND #11-19 TO 121.0KW.
9. BIFACIAL GAIN ASSUMED TO BE LESS THAN 25%.

INVERTER WIRING DIAGRAM

SYSTEM DESIGN CALCULATIONS

DESCRIPTION	CALCULATION
THE NUMBER OF MODULES IN A STRING IS BASED ON MANUFACTURER'S SPECIFICATIONS FOR THE TEMPERATURE CO-EFFICIENT FOR VOLTAGE. FOR THE VSUN545-144BMH-DG (545W) MODULE IS -0.27%/ºC AT AN AMBIENT TEMPERATURE OF 25ºC. BASED ON THE RECORD LOW OF -18.6ºC THE TEMPERATURE DIFFERENTIAL IS 43.6ºC. FORMULA: VOC*TEMPERATURE DIFFERENTIAL*TEMPERATURE COEFFICIENT	VOLTAGE INCREASE FOR 43.6ºC DIFFERENTIAL IS = 49.81Vx(43.6Vx0.0027) = 5.86V MODULE MAXIMUM ALLOWABLE MODULES IN SERIES FOR A 1500V SYSTEM = 1500V/(49.81V+5.86V) = 26.94 NUMBER OF MODULES IN SERIES IN ONE STRING SELECTED = 26 MODULES TOTAL OPEN CIRCUIT VOLTAGE WITH CORRECTION FACTOR = 26x(49.81V+5.86V) = **1447.42V**
BIFACIAL GAIN OF 12% INCLUDED IN CALCULATIONS (PER NEC 2017 690.8(A)(1)(1), SAM SIMULATION RESULTS) FORMULA: I_{MP} OF MODULE*1.12	I_{MAX} = 13.04A*1.12 = **14.605A**
STRING FUSE DISCONNECT SIZING (PER NEC 2017 690.9B) FORMULA: I_{MAX}*1.25	1 STRING (26 MODULES) = 14.605A*1.25 = 18.256A. NEXT SIZE UP = **20A**
COMBINER BOX MAX CURRENT FORMULA (PER NEC 2017 690.8(A)(1)) FORMULA: I_{MAX} *NUMBER OF STRINGS	$ISC_{MAX,PCCB}$ =14.605A*14 = **204.47A**
COMBINER BOX FUSE DISCONNECT SIZING (PER NEC 2017 690.9(B)) FORMULA: I_{MAX} *1.25*NUMBER OF STRINGS	14 STRING COMBINER BOX =14.605A*1.25*14 = 255.58A. NEXT SIZE UP = **300A**
14 STRING COMBINER BOX OUTPUT CONDUCTOR SIZING PER NEC 2017 690.8(A)&(B): FORMULA: I_{MAX} *1.25*NUMBER OF STRINGS	14 STRING COMBINER BOX = 14.605A*1.25*14 = **255.58A** PER NEC 2017 TABLE 310.15(B)(16) FOR ALUMINUM CONDUCTORS WITH 90ºC TEMPERATURE RATING, 300KCMIL CONDUCTOR CAN HANDLE UP TO 260A.
THERMAL AMPACITY CORRECTIONS	SEE ELK STREET PRELIMINARY THERMAL AMPACITY AND CONDUIT FILL STUDY

REV #	DESCRIPTION	DATE	BY

ELK STREET SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

INVERTER WIRING DIAGRAM

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STATE OF NEW YORK — LICENSED — KIMBERLY SUZANNE CRAWFORD — 150556 — PROFESSIONAL ENGINEER
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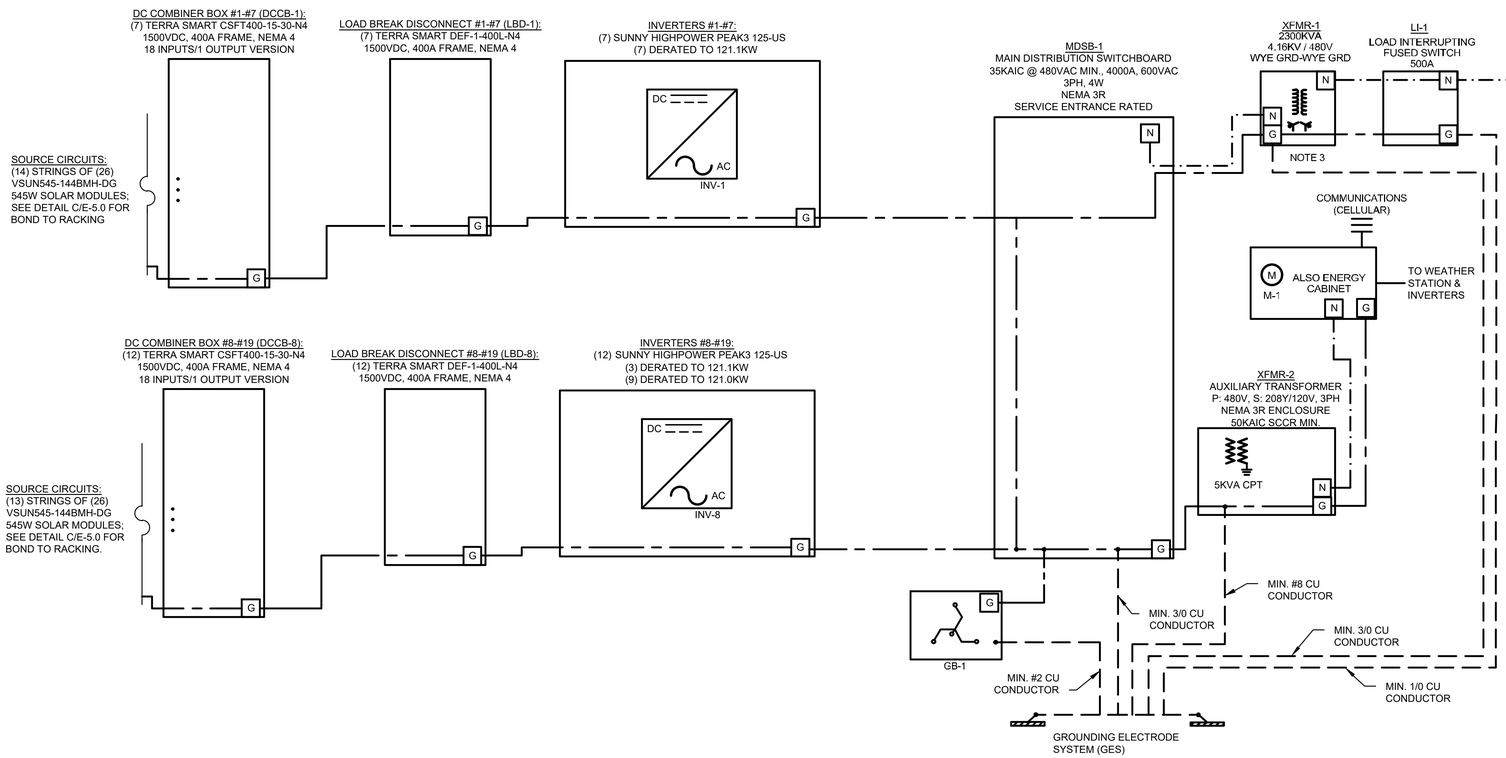
		DRAWING: E-6.2



LEGEND

- EQUIPMENT GROUNDING CONDUCTOR (EGC)
- GROUNDING ELECTRODE CONDUCTOR (GEC)
- GROUNDED CONDUCTOR (NEUTRAL)
- GROUND PLATE

DRAWING NOTES:

1. THE GROUND GRID WILL BE CONSTRUCTED OF 4/0 BARE CONDUCTOR WITH A MAXIMUM RESISTANCE TO GROUND OF 5 OHMS.
2. SEE CONDUCTOR SCHEDULES ON SHEETS E-6.5 THROUGH E-6.6 FOR EGC SIZES.
3. N-G BOND TO OCCUR AT XFMR-1 AND RISER POLE (C-5) WITH MIN. 1/0 CU CONDUCTOR.
4. N-G BOND TO OCCUR AT XFMR-2 WITH MIN. #8 CU CONDUCTOR.
5. TO BE FINALIZED BASED ON FINAL GROUNDING STUDY.

GROUNDING DIAGRAM

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ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

GROUNDING DIAGRAM

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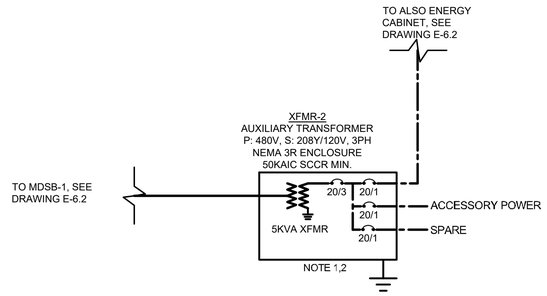
LEGEND

AC POWER, SINGLE PHASE

AC POWER, 3 PHASE

DRAWING NOTES:
1. LIGHTS AND 120V GFI OUTLETS TO BE INCLUDED IN SWITCHPAD.
2. 120V POWER TO BE FED FROM SQUARE D MINI POWER ZONE (MPZ5S40F) OR EQUIVALENT.



AUXILIARY POWER DIAGRAM

REV #	DESCRIPTION	DATE	BY

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SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

AUXILIARY POWER
DIAGRAM

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9/5/2024

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	APPROVED BY: JSC		

WIRE AND CONDUIT SCHEDULE - DC

FROM	TO	COMMENT	OCPD RATING	# OF PHASE COND.	PHASE & NEUTRAL WIRE TYPE	# OF PARALLEL SETS[4]	MIN. PHASE WIRE SIZE	ESTIMATED ONE-WAY DISTANCE (MAX, FEET)	VOLTAGE DROP[5] (%)	EQUIPMENT GROUNDING CONDUCTOR WIRE SIZE (CU)[6]	SHALLOW BURIED ON LANDFILL/ABOVE GROUND CONDUIT TYPE	NORMAL BURIAL DEPTH CONDUIT TYPE	CONDUIT SIZE[7]
PV MODULES	INVERTERS	PV SOURCE CIRCUITS, TYP.	30	2	PV CABLE (CU, 1500V)	1	#10	250	0.87%	#6	N/A	N/A	SEE NOTE 5
DCCB-01	LBD-01	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	500	750	1.11%	#1	RMC	N/A	3-1/2"
DCCB-02	LBD-02	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	500	660	0.98%	#1	RMC	N/A	3-1/2"
DCCB-03	LBD-03	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	400	545	1.01%	#2	RMC	N/A	3"
DCCB-04	LBD-04	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	400	585	1.08%	#2	RMC	N/A	3"
DCCB-05	LBD-05	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	500	695	1.03%	#1	RMC	N/A	3-1/2"
DCCB-06	LBD-06	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	600	785	0.97%	#1	RMC	N/A	3-1/2"
DCCB-07	LBD-07	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	600	850	1.05%	#1	RMC	N/A	3-1/2"
DCCB-08	LBD-08	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	235	0.63%	#4	RMC	N/A	3"
DCCB-09	LBD-09	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	105	0.28%	#4	RMC	N/A	3"
DCCB-10	LBD-10	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	205	0.55%	#4	RMC	N/A	3"
DCCB-11	LBD-11	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	290	0.77%	#4	RMC	N/A	3"
DCCB-12	LBD-12	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	320	0.85%	#4	RMC	N/A	3"
DCCB-13	LBD-13	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	410	1.01%	#4	RMC	N/A	3"
DCCB-14	LBD-14	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	400	470	0.87%	#2	RMC	N/A	3"
DCCB-15	LBD-15	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	400	560	1.04%	#2	RMC	N/A	3"
DCCB-16	LBD-16	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	410	1.01%	#4	RMC	N/A	3"
DCCB-17	LBD-17	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	350	0.86%	#4	RMC	N/A	3"
DCCB-18	LBD-18	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	290	0.77%	#4	RMC	N/A	3"
DCCB-19	LBD-19	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	230	0.61%	#4	RMC	N/A	3"
LBD-01	INV-01	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.02%	#4	RMC	N/A	3"
LBD-02	INV-02	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.02%	#4	RMC	N/A	3"
LBD-03	INV-03	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.02%	#4	RMC	N/A	3"
LBD-04	INV-04	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.02%	#4	RMC	N/A	3"
LBD-05	INV-05	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.02%	#4	RMC	N/A	3"
LBD-06	INV-06	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.02%	#4	RMC	N/A	3"
LBD-07	INV-07	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.02%	#4	RMC	N/A	3"
LBD-08	INV-08	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.03%	#4	RMC	N/A	3"
LBD-09	INV-09	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.03%	#4	RMC	N/A	3"
LBD-10	INV-10	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.03%	#4	RMC	N/A	3"
LBD-11	INV-11	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.03%	#4	RMC	N/A	3"
LBD-12	INV-12	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.03%	#4	RMC	N/A	3"
LBD-13	INV-13	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.03%	#4	RMC	N/A	3"
LBD-14	INV-14	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.03%	#4	RMC	N/A	3"
LBD-15	INV-15	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.03%	#4	RMC	N/A	3"
LBD-16	INV-16	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.03%	#4	RMC	N/A	3"
LBD-17	INV-17	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.03%	#4	RMC	N/A	3"
LBD-18	INV-18	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.03%	#4	RMC	N/A	3"
LBD-19	INV-19	PV OUTPUT CIRCUITS, TYP.	300	2	RHW-2 (AL)	1	300	10	0.03%	#4	RMC	N/A	3"

NOTES:

1. CONDUCTOR SIZING ASSUMES THAT NO MORE THAN ONE CIRCUIT WILL BE INSTALLED IN EACH CONDUIT. SEE THE "MAXIMUM # OF CONDUCTORS ALLOWABLE" TABLE IF MSW HANGERS ARE TO BE SHARED BY MULTIPLE CIRCUITS.
2. EQUIPMENT GROUNDING CONDUCTORS SIZED 8AWG AND SMALLER THAT ARE SUBJECT TO PHYSICAL DAMAGE MUST BE INSTALLED IN A RACEWAY. WHERE MULTIPLE CIRCUITS ARE IN THE SAME MSW, USE THE MAX EGC FOR ALL CIRCUITS IN THAT BUNDLE.
3. CONDUCTOR TERMINALS SHALL BE RATED TO 75°C MINIMUM ON AC EQUIPMENT, 90°C ON DC EQUIPMENT.
4. EACH PARALLEL SET IS ASSUMED TO CONTAIN (2) CONDUCTORS AND (1) EGC CONTAINED IN (1) CONDUIT FOR DC CIRCUITS.
5. INSTALL PV WIRE IN MESSENGER SUPPORTED WIRING OR USING CABLE CLIPS ATTACHED TO THE RACKING. WHERE INSTALLING IN MSW IS NOT POSSIBLE, INSTALL IN 1/2" CONDUIT. WHEN PENETRATING EQUIPMENT ENCLOSURES, CONDUIT IS NOT NECESSARY, BUT NYLON BUSHINGS, OR APPROVED EQUAL, ARE NECESSARY FOR ABRASION RESISTANCE.
6. DC FUSES SHALL BE LISTED FOR 1,500 VDC. & BE RATED FOR USE IN PV SYSTEMS.
7. CONDUCTORS ARE ASSUMED TO BE IN MSW UNLESS OTHERWISE NOTED ON SITE PLAN.

DC CONDUCTOR SCHEDULE

MAXIMUM # OF CONDUCTORS ALLOWABLE							
	PV SOURCE CONDUCTORS	PV OUTPUT CONDUCTORS				INVERTER OUTPUT CONDUCTORS	
	#10 AWG	300 KCMIL	400 KCMIL	500 KCMIL	600 KCMIL	250 KCMIL	300 KCMIL
IN MSW[1]							
1 BUNDLE	36	4	8	10	14	6	9
IN CONDUIT[2,3]							
1-1/2"	6	N/A	N/A	N/A	N/A	N/A	N/A
2"	10						
2-1/2"	16						
3"	26	2	2			3	3
3-1/2"	N/A	2	2	2	2	3	3
4"		4	2	2	2	6	3
5"		6	6	4	4	9	6

[1] MAXIMUM # OF CONDUCTORS SHOWN LIMITED BY AMPACITY AND MAY BE FURTHER LIMITED BY MECHANICAL CONSTRAINTS. WIND SPEED = 1.34 MPH AND AMBIENT TEMP = 30 °C USED IN AMPCALC CALCULATIONS.

[2] MAXIMUM # OF CONDUCTORS LIMITED BY AMPACITY AND MAXIMUM OF 20% CONDUIT FILL. WIND SPEED = 1.34 MPH AND AMBIENT TEMP = 30 °C USED IN AMPCALC CALCULATIONS.

[3] CONDUIT ASSUMED TO BE ABOVE GRADE WITH MIN. 1" SPACING.

[4] CONDUCTORS OF DIFFERENT VOLTAGES MUST BE KEPT IN SEPARATE BUNDLES/CONDUITS, SEPARATED BY MIN. 1" SPACING.

[4] MINIMUM EGC SIZE PER BUNDLE/CONDUIT TO CORRESPOND TO SPECIFIED GROUND WIRE SIZE FOR LARGEST CONDUCTOR INCLUDED IN THE BUNDLE/CONDUIT.

MAXIMUM # OF CONDUCTORS ALLOWABLE TABLE

REV #	DESCRIPTION	DATE	BY
1	UPDATED DC CONDUCTOR SIZING	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

DC CONDUCTOR SCHEDULE

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STATE OF NEW YORK — LICENSED PROFESSIONAL ENGINEER — JENNIFER SUZANNE CRAWFORD — 100556

9/5/2024

DATE	9/5/2023
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WIRE AND CONDUIT SCHEDULE - AC

		COMMENT	OCPD RATING	# OF PHASE COND.	PHASE & NEUTRAL WIRE TYPE	# OF PARALLEL SETS[4]	MIN. PHASE WIRE SIZE	ESTIMATED ONE-WAY DISTANCE (MAX, FEET)	VOLTAGE DROP[5] (%)	MIN. NEUTRAL WIRE SIZE	EQUIPMENT GROUND CONDUCTOR WIRE SIZE (CU)[2]	SHALLOW BURIED ON LANDFILL/ABOVE GROUND CONDUIT TYPE	NORMAL BURIAL DEPTH CONDUIT TYPE	CONDUIT SIZE[6]
INV-01	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	75	0.34%	N/A	#4	RMC	N/A	3"
INV-02	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	85	0.38%	N/A	#4	RMC	N/A	3"
INV-03	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	95	0.42%	N/A	#4	RMC	N/A	3"
INV-04	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	105	0.47%	N/A	#4	RMC	N/A	3"
INV-05	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	110	0.49%	N/A	#4	RMC	N/A	3"
INV-06	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	120	0.54%	N/A	#4	RMC	N/A	3"
INV-07	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	130	0.58%	N/A	#4	RMC	N/A	3"
INV-08	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	135	0.60%	N/A	#4	RMC	N/A	3"
INV-09	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	145	0.65%	N/A	#4	RMC	N/A	3"
INV-10	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	40	0.18%	N/A	#4	RMC	N/A	3"
INV-11	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	50	0.22%	N/A	#4	RMC	N/A	3"
INV-12	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	60	0.27%	N/A	#4	RMC	N/A	3"
INV-13	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	65	0.29%	N/A	#4	RMC	N/A	3"
INV-14	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	75	0.33%	N/A	#4	RMC	N/A	3"
INV-15	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	85	0.38%	N/A	#4	RMC	N/A	3"
INV-16	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	90	0.40%	N/A	#4	RMC	N/A	3"
INV-17	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	100	0.45%	N/A	#4	RMC	N/A	3"
INV-18	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	110	0.49%	N/A	#4	RMC	N/A	3"
INV-19	MDSB-1	INVERTER OUTPUT CIRCUIT	200	3	XHHW-2 (AL)	1	250	120	0.54%	N/A	#4	RMC	N/A	3"
MDSB-1	XFMR-1	AC BRANCH CIRCUIT	3600	3	BUSBAR CONNECTION	N/A	N/A	N/A	N/A	BUSBAR NEUTRAL	N/A	N/A	N/A	N/A
MDSB-1	AUX-1	AC BRANCH CIRCUIT	15	3	XHHW-2 (CU)	1	#12	20	0.14%	N/A	#12	RMC	N/A	3/4"
MDSB-1	GB-1	AC BRANCH CIRCUIT	200	3	XHHW-2 (AL)	1	#4/0	20	0.10%	(2)500	#6	RMC	N/A	4"

NOTES:
1. CONDUCTOR SIZING ASSUMES THAT NO MORE THAN THREE-CURRENT CARRYING CONDUCTORS WILL BE INSTALLED IN EACH CONDUIT. SEE THE "MAXIMUM # OF CONDUCTORS ALLOWABLE" TABLE IF MSW HANGERS ARE TO BE SHARED BY MULTIPLE CIRCUITS.
2. EQUIPMENT GROUNDING CONDUCTORS SIZED 8AWG AND SMALLER THAT ARE SUBJECT TO PHYSICAL DAMAGE MUST BE INSTALLED IN A RACEWAY. WHERE MULTIPLE CIRCUITS ARE IN THE SAME MSW, USE THE MAX EGC FOR ALL CIRCUITS IN THAT BUNDLE.
3. CONDUCTOR TERMINALS SHALL BE RATED TO 75°C MINIMUM ON AC EQUIPMENT, 90°C ON DC EQUIPMENT.
4. EACH PARALLEL SET IS ASSUMED TO CONTAIN (2-3) PHASE CONDUCTORS, (1) NEUTRAL AND (1) EGC CONTAINED IN (1) CONDUIT FOR AC CIRCUITS.
5. AC VOLTAGE DROP CALCULATIONS ASSUME POWER FACTOR = 1.
6. CONDUCTORS ARE ASSUMED TO BE IN MSW UNLESS OTHERWISE NOTED ON SITE PLAN.

AC CONDUCTOR SCHEDULE

REV #	DESCRIPTION	DATE	BY
1	UPDATED AC CONDUCTOR SIZING	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

AC CONDUCTOR SCHEDULE

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STATE OF NEW YORK — JENNIFER SUZANNE CRAWFORD — 130556 — LICENSED PROFESSIONAL ENGINEER
3/22/2024

DATE	DRAWN BY: TSB, JAT, ESA	N:\WORK\5566.02 Elk Street\DWG\5566.02 SCHEDULES AND DIAGRAMS.dwg
9/5/2023	DESIGNED BY: TSB, JAT	
SCALE: AS SHOWN	CHECKED BY: TSB, JSC	C&A JOB#: 5566.03
	APPROVED BY: JSC	DRAWING: E-6.6

AUXILIARY POWER SCHEDULE

FROM	TO	COMMENT	OCPD RATING	# OF PHASE COND.	PHASE & NEUTRAL WIRE TYPE	# OF PARALLEL SETS[4]	MIN. PHASE WIRE SIZE	ESTIMATED ONE-WAY DISTANCE (MAX, FEET)	VOLTAGE DROP[5] (%)	MIN. NEUTRAL WIRE SIZE	GROUND WIRE SIZE (CU)[2]	CONDUIT TYPE	CONDUIT SIZE[6]
AUX-1	A.E. CABINET	AC BRANCH CIRCUIT	20	1	XHHW-2 (CU)	1	#12	10	0.40%	#12	#12	PVC	3/4"
AUX-1	ACCESSORY POWER	AC BRANCH CIRCUIT	20	1	XHHW-2 (CU)	1	#12	10	0.40%	#12	#12	PVC	3/4"
AUX-1	SPARE	AC BRANCH CIRCUIT	20	1	XHHW-2 (CU)	1	#12	10	0.40%	#12	#12	PVC	3/4"
A.E DAS (L1)	WEATHER STATION (L31)	WEATHER STATION POWER	N/A	2	XHHW-2 (CU)	1	#14	40	0.09%	N/A	#14	RMC	1-1/2"
A.E DAS (L1)	PY1 (L31)	COMMUNICATION/POWER	N/A	N/A	RS-485	1	N/A	40	N/A	N/A	N/A		
A.E. DAS (L1)	WEATHER STATION (L31)	COMMUNICATION	N/A	N/A	RS-485	1	N/A	40	N/A	N/A	N/A		
SEL-651R RELAY	POI(L51)	SWITCH POWER	N/A	2	XHHW-2 (CU)	1	#14	15	0.26%	N/A	#14	PVC	1"
POI (L51)	RECLOSER	COMM	N/A	N/A	CAT 5E	1	N/A	15	N/A	N/A	N/A		
INV-1 THROUGH INV-19	A.E. DAS (L1)	COMMUNICATION	N/A	N/A	CAT 5E	1	N/A	285	N/A	N/A	N/A	PVC	3/4"
A.E. DAS (L1)	POI (L51)	COMMUNICATION	N/A	N/A	MM FIBER OPTIC	1	N/A	1200	N/A	N/A	N/A	PVC	3/4"

NOTES:
1. CONDUCTOR SIZING ASSUMES THAT NO MORE THAN THREE-CURRENT CARRYING CONDUCTORS WILL BE INSTALLED IN EACH CONDUIT. SIZES MUST BE INCREASED IF CONDUIT IS TO BE SHARED BY MULTIPLE CIRCUITS.
2. EQUIPMENT GROUNDING CONDUCTORS SIZED 8AWG AND SMALLER THAT ARE SUBJECT TO PHYSICAL DAMAGE MUST BE INSTALLED IN A RACEWAY.
3. CONDUCTOR TERMINALS SHALL BE RATED TO 75°C MINIMUM ON AC EQUIPMENT, 90°C ON DC EQUIPMENT.
4. EACH PARALLEL SET IS ASSUMED TO CONTAIN (2-3) PHASE CONDUCTORS, (1) NEUTRAL AND (1) EGC CONTAINED IN (1) CONDUIT.
5. AC VOLTAGE DROP CALCULATIONS ASSUME POWER FACTOR = 1.
6. CONDUCTORS ARE ASSUMED TO BE IN MSW UNLESS OTHERWISE NOTED ON SITE PLAN.

AUXILIARY POWER SCHEDULE

REV #	DESCRIPTION	DATE	BY
1	UPDATED AUXILIARY CONDUCTOR SCHEDULE	3/22/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT
CITY OF BUFFALO — ERIE COUNTY, NY

AUXILIARY POWER SCHEDULE

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

LICENSED PROFESSIONAL ENGINEER — JENNIFER SUZANNE CROUCH — STATE OF NEW YORK — 100556
3/22/2024

DATE	9/5/2023
SCALE	AS SHOWN
DRAWN BY:	TSB, JAT, ESA
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CHECKED BY:	TSB, JSC
APPROVED BY:	JSC
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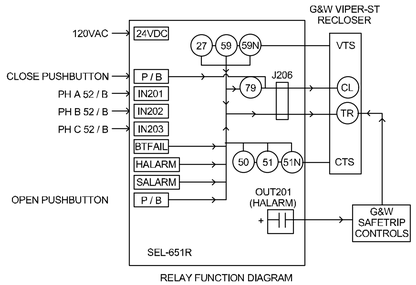
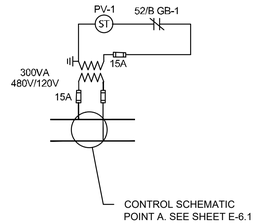
C&A JOB#	5566.03
DRAWING:	E-6.7



RELAY FUNCTION DIAGRAM



CONTROL SCHEMATIC
POINT A. SEE SHEET E-6.1

DRAWING NOTES:

1. PV-1 BREAKER WILL BE INTERLOCKED TO TRIP WHEN THE GB-1 BREAKER IS OPEN. SEE CONTROL SCHEMATIC POINT B ON SHEET E-6.1.

AC CONTROL SCHEMATIC

REV #	DESCRIPTION	DATE	BY
1	SHEET ADDED PER NATIONAL GRID COMMENTS	3/5/24	JAT

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO — ERIE COUNTY, NY

AC CONTROL SCHEMATIC

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

STATE OF NEW YORK — JENNIFER SUZANNE CRAWFORD — 110586 — LICENSED PROFESSIONAL ENGINEER

SEAL 2024

DATE	9/5/2023
SCALE	AS SHOWN
DRAWN BY:	TSB, JAT, ESA
DESIGNED BY:	TSB, JAT
CHECKED BY:	TSB, JSC
APPROVED BY:	JSC
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C&A JOB#	5566.03
DRAWING:	E-6.8

DESIGN INFORMATION FOR PV MODULES TO BE INSTALLED

VSUN
Innovative & Smart

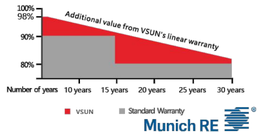
VSUN545-144BMH-DG

545W
Highest power output

21.32%
Module efficiency

12years
Material & Workmanship warranty

30years
Linear power output warranty



VSUN545-144BMH-DG VSUN540-144BMH-DG
VSUN535-144BMH-DG VSUN530-144BMH-DG

- MBB technology with Circular Ribbon
- Higher output power
- Half-cell Technology
- Positive tolerance offer
- Micro Gap
- Up to 30% extra power generation yield from the back side
- Certified for salt/ammonia corrosion resistance
- Load certificates: wind to 2400Pa and snow to 5400Pa
- Lower LCOE

VSUN, a BNEF Tier-1 PV module manufacturer invested by Fuji Solar, has been committed to providing greener, cleaner and more intelligent renewable energy solutions. VSUN is dedicated to bringing reliable, customized and high-efficient products into various markets and customers worldwide.

Engineered in Japan
www.vsun-solar.com

最も信頼出来る再エネパートナー

Electrical Characteristics at Standard Test Conditions(STC)

Module Type	VSUN545-144BMH-DG	VSUN540-144BMH-DG	VSUN535-144BMH-DG	VSUN530-144BMH-DG
Maximum Power - Pmax (W)	545	540	535	530
Open Circuit Voltage - Voc (V)	49.81	49.65	49.5	49.35
Short Circuit Current - Isc (A)	13.92	13.85	13.78	13.71
Maximum Power Voltage - Vmpp (V)	41.8	41.65	41.5	41.35
Maximum Power Current - Impp (A)	13.04	12.97	12.9	12.82
Module Efficiency	21.32%	21.13%	20.93%	20.74%

Standard Test Conditions (STC): irradiance 1,000 W/m², AM 1.5, module temperature 25°C. Pmax Sorting : 0~5W. Measuring Tolerance: ±3%.
Remark: Electrical data do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.

Electrical Characteristics with different rear side power gain(reference to 540 front)

Pmax (W)	Voc (V)	Isc (A)	Vmpp (V)	Impp (A)	Pmax gain
567	49.65	14.54	41.65	13.62	5%
594	49.65	15.24	41.65	14.27	10%
648	49.75	16.62	41.61	15.56	20%
675	49.75	17.31	41.61	16.21	25%

Temperature Characteristics

NOCT	45°C(±2°C)
Voltage Temperature Coefficient	-0.27%/°C
Current Temperature Coefficient	+0.048%/°C
Power Temperature Coefficient	-0.32%/°C

Maximum Ratings

Maximum System Voltage [V]	1500
Series Fuse Rating [A]	30
Bifaciality	70%±10%

Material Characteristics

Dimensions	2256×1133×35mm (L×W×H)
Weight	32.5kg
Frame	Silver anodized aluminum profile
Front Glass	High transparency,Antireflection coated,Semi-toughened safety glass, 2.0mm
Cell Encapsulation	EVA (Ethylene-Vinyl-Acetate) or POE
Back Glass	Glazed & Semi-toughened safety glass, 2.0mm
Cells	12×12 pieces bifacial monocrystalline solar cells series strings
Junction Box	IP68, 3 diodes
Cable&Connector	Potrait: 500 mm (cable length can be customized) , 1×4 mm 2 , compatible with MC4

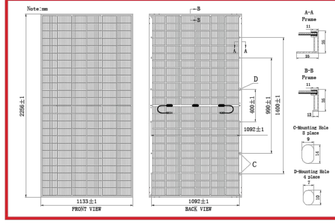
Packaging

Dimensions(L×W×H)	2290×1125×1253mm
Container 20'	150
Container 40'	300
Container 40'HC	600

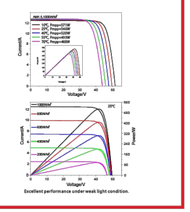
System Design

Temperature Range	-40 °C to + 85 °C
Withstanding Hail	Maximum diameter of 25 mm with impact speed of 23 m/s
Maximum Surface Load	5,400 Pa
Application class	class A

Dimensions



IV-Curves



MODULE DATASHEET

NOTES:
1. CONNECTORS USED TO STRING VSUN MODULES TO BE PV-ZH202B-SCNR62 CONNECTORS. NO OTHER CONNECTOR TYPES ARE ACCEPTABLE FOR MATING TO THE MODULE CONNECTORS.

REV #	DESCRIPTION	DATE	BY

ELK STREET
SOLAR DEVELOPMENT PROJECT
CITY OF BUFFALO — ERIE COUNTY, NY

MODULE DATASHEET

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
ENGINEERING & LAND SURVEYING, PC
4411 Route 9, Suite 200, Hudson New York 12534 tel: (518) 828-2700
www.crawfordandassociates.com fax: (518) 828-2723

STATE OF NEW YORK — JENNIFER SUZANNE CROUCH — 110566 — LICENSED PROFESSIONAL ENGINEER
9/5/2024

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AS SHOWN	APPROVED BY: JSC	DRAWING: E-7.0

SUNNY HIGHPOWER PEAK3
125-US / 150-US / 165-US / 172-US

SMA

Cost effective	Maximum flexibility	Simple install, commissioning	Highly innovative
• Modular architecture reduces BOS and maximizes system uptime • Compact design and high power density maximize transportation and logistical efficiency	• Scalable 1,500 VDC building block with best-in-class performance • Flexible architecture creates scalability while maximizing land usage	• Ergonomic handling and simple connections enable quick installation • Centralized commissioning and control with SMA Data Manager	• SMA Smart Connected reduces O&M costs and simplifies field-service • Powered by award winning ennexOS cross sector energy management platform

SUNNY HIGHPOWER PEAK3
125-US / 150-US / 165-US / 172-US

A superior modular solution for large-scale power plants

The PEAK3 1,500 VDC inverter offers high power density in a modular architecture that achieves a cost-optimized solution for large-scale PV integrators. With fast, simple installation and commissioning, the Sunny Highpower PEAK3 is accelerating the path to energization. SMA has also brought its field-proven Smart Connected technology to the PEAK3, which simplifies O&M and contributes to lower lifetime service costs. The PEAK3 power plant solution is powered by the ennexOS cross sector energy management platform, 2018 winner of the Intersolar smarter E AWARD.

DESIGN INFORMATION FOR INVERTERS TO BE INSTALLED

Technical Data	Sunny Highpower PEAK3 125-US	Sunny Highpower PEAK3 150-US	Sunny Highpower PEAK3 165-US	Sunny Highpower PEAK3 172-US
Input (DC)				
Maximum array power [1]	250 kWp	300 kWp	330 kWp	344 kWp
Maximum system voltage	1500 Vdc			
Rated MPP voltage range	705 V ... 1450 V	880 V ... 1450 V	924 V ... 1450 V	968 V ... 1450 V
MPPT operating voltage range	684 V ... 1500 V	855 V ... 1500 V	898 V ... 1500 V	941 V ... 1500 V
MPP trackers	1			
Maximum operating input current	180 A			
Maximum input short-circuit current	325 A			
Output (AC)				
Nominal AC power	125 kW	150 kW	165 kW	172 kW
Maximum apparent power	125 kVA	150 kVA	165 kVA	172 kVA
Output phases / line connections	3 / 3-PE			
Nominal AC voltage	480 V	600 V	630 V	660 V
Compatible transformer winding configuration	Wye-grounded			
Maximum output current	151 A			
Rated grid frequency	60 Hz			
Grid frequency / range	50 Hz, 60 Hz / -6 Hz ... +6 Hz			
Power factor at rated power / adjustable displacement	1 / 0.8 leading ... 0.8 lagging			
Harmonics (THD)	<3%			
Efficiency				
CEC efficiency	98.5 %	99.0 %	99.0 %	99.0 %
Protection and safety features				
Ground fault monitoring: Riso / Differential current	● / ●			
DC reverse polarity protection	●			
AC short circuit protection	●			
Monitored surge protection (Type 2): DC / AC	● / ●			
Protection class / overvoltage category (as per UL 840)	I / IV			
General data				
Device dimensions (W / H / D)	770 / 830 / 462 mm (30.3 / 32.7 / 18.2 in)			
Device weight	99 kg (218 lbs)			
Operating temperature range	-25°C ... +60°C (-13°F ... +140°F)			
Storage temperature range	-40°C ... +70°C (-40°F ... +158°F)			
Audible noise emission (full power @ 1m and 25°C)	< 69 dB(A)			
Internal consumption at night	< 5 W			
Topology	Transformerless			
Cooling concept	OptiCool (forced convection, variable speed fans)			
Enclosure protection rating	Type 4X			
Maximum permissible relative humidity (non-condensing)	100%			
Additional information				
Mounting	Rack mount			
DC connection	Terminal lug (up to 600 kcmil CU/AL)			
AC connection	Screw terminal (up to 300 kcmil CU/AL)			
LED indicators (Status/Fault/Communication)	●			
SMA Speedwire (Ethernet network interface)	● (2 x RJ45 ports)			
Data protocols: SMA Modbus / SunSpec Modbus	● / ●			
Integrated Plant Control / Q on Demand 24/7	● / ●			
Off-grid capable / SMA Hybrid Controller compatible	– / ●			
Monitoring				
SMA Sunny Portal (monitoring portal)	No cost for the lifetime of the system			
SMA Smart Connected (monitoring and remote O&M service)	No cost on inverters under warranty			
Supported protocols for outbound data	SMA external API, Modbus, FTP			
Certifications				
Certifications and approvals (pending)	UL 62109, UL 1998, CAN/CSA-C22.2 No.62109			
Manufacturer's Declaration of Design Life	25 years			
FCC compliance	FCC Part 15, Class A			
Grid interconnection standards	IEEE 1547:2018, UL 1741-SA - CA Rule 21, HECO Rule 14H, UL1741SB			
Advanced grid support capabilities	L/HFRT, L/HVRT, Volt-VAr, Volt-Watt, Frequency-Watt, Ramp Rate Control, Fixed Power Factor			
Warranty				
Standard	5 years			
Optional extensions	10 / 15 / 20 / 25 years			
Type designation	SHP 125-US-21	SHP 150-US-21	SHP 165-US-21	SHP 172-US-21

1) Higher DC array power permitted via site inverter load modeling in SMA Sunny Design

● Standard features ○ Optional features – Not available

Toll Free +1 888 4 SMA USA
www.SMA-America.com

SMA America, LLC

INVERTER DATASHEET

REV #	DESCRIPTION	DATE	BY

ELK STREET
SOLAR DEVELOPMENT PROJECT

CITY OF BUFFALO ERIE COUNTY, NY

INVERTER DATASHEET

INOVATEUS SOLAR LLC
19890 State Line Road
South Bend, IN 46637

CRAWFORD & ASSOCIATES
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Job-Site Specific Health and Safety Plan

Elk St. Solar Project

Inovateus Solar™
DEVELOPMENT | ENGINEERING | PROCUREMENT | CONSTRUCTION

Contents

Policies, Procedures, and other guidance documents that are referenced within this document are considered part of this Site-Specific Safety Plan and are compiled and maintained under separate cover

1 Project/Site Information

Elk Street Solar Project – CleanCapital
503 Elk Street
Buffalo, NY 14210
Erie County

System Size: 3.6MW DC/2.3 MWAC

Latitude (Decimal): 42.864775 º N Longitude (Decimal): 78.834031 º W

1.1 Emergency Contact Information

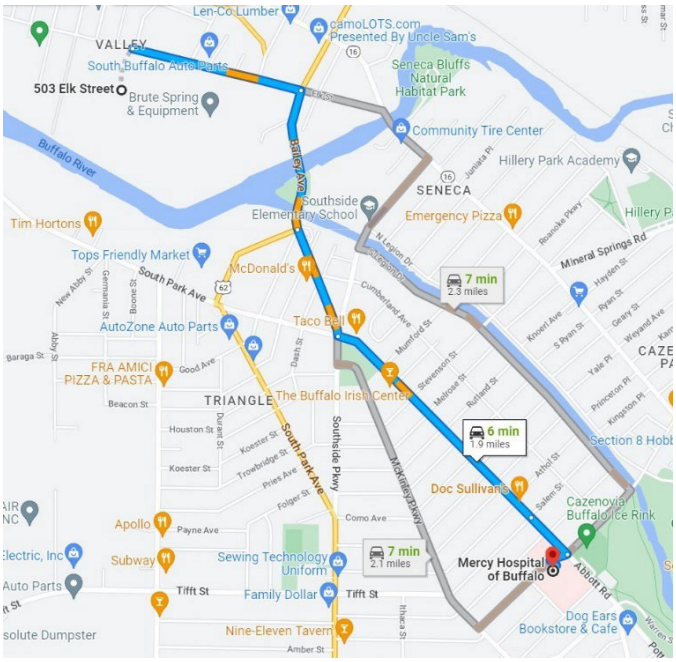
Emergency Response Agencies	
Fire Department (Tell 911 operator which county you are in)	911 – Emergency
Police Department (Tell 911 operator which county you are in)	911 – Emergency
Emergency Medical Service	911
Mercy Hospital of Buffalo 565 Abbot Road Buffalo, NY 14220	(716) 826-7000
Nationwide Underground Utility Locate Center	811

1.2 Onsite Emergency Contacts

Job-Site Project Personnel	
[Joaquin Corona] Inovateus Solar Construction Manager	Cell: (620) 388-0009 Email: joaquin.corona@inovateus.com
[Megan Drean] Inovateus Solar Project Manager	Cell: (248) 672-0620 Email: megan.drean@inovateus.com
[Elana Smith] Inovateus Solar Assistant Project Manager	Cell: (716) 310-3409 Email: Elana.smith@inovateus.com
[George Boyd] Inovateus Solar Project Quality Manager	Cell: (530) 340-1863 Email: George.Boyd@inovateus.com
[Dan Foster] Milestone Construction Partners Civil Subcontractor Project Manager	Cell: TBD Email: TBD
[Bryan Lampson] LBFNY Mechanical Project Manager	Cell: (585) 507-8271 Email: bryan@lbfny.com
[Yogi Gaona] LBFNY Mechanical Foreman	Cell: (863) 517-9343 Email: Yogi@lbfny.com
[Devyn Smith] Schuler-Haas Electrical Project Manager	Cell: (607) 481-8933 Email: Djsmith@schuler-haas.com
[Mike Rowntree] Schuler-Haas Electrical Foreman	Cell: TBD Email: mrowntree@schuler-haas.com

Note: Communication devices that will be used are verbal, cell phone or radios.

Mercy Hospital of Buffalo
565 Abbot Road
Buffalo, NY 14220
(716) 826-7000



East on Elk Street, turn right onto Bailey Avenue. Left onto McKinlney Parkway, turn left onto Abbot Road, then right on Lorraine Avenue.

Travel time = 6 minutes

1.3 Job-Site COVID-19

Inovateus Solar takes the health and safety of our employees very seriously. With the spread of the coronavirus or "COVID-19," a respiratory disease caused by the SARS-CoV-2 virus, the Company must remain vigilant in mitigating the outbreak. In order to be safe and maintain operations, we have developed a COVID-19 Exposure Prevention, Preparedness, and Response Plan to be implemented, to the extent feasible and appropriate, throughout the Company and at all of our job sites. This Plan is based on information available from the CDC and OSHA at the time of its development, and is subject to change based on further information provided by the CDC, OSHA, and other public officials.

The Exposure Action Plan will be posted at the Job-Site and will cover the following:

1. Responsibilities of Managers and Supervisors
2. Responsibilities of Employees
3. Job-Site Protective Measures
4. Job-Site Cleaning and Disinfecting
5. Job-Site Exposure Situations
6. OSHA Recordkeeping
7. Confidential/Privacy
8. General Questions

OSHA and the CDC have provided the following control and preventative guidance for all employees, regardless of exposure risk:

- Frequently wash your hands with soap and water for at least 20 seconds. When soap and running water are unavailable, use an alcohol-based hand rub with at least 60% alcohol.

- Avoid touching your eyes, nose, or mouth with unwashed hands.
- Follow appropriate respiratory etiquette, which includes covering for coughs and sneezes.
- Avoid close contact with people who are sick.

In addition, all employees and job-site personnel must familiarize themselves with the symptoms of COVID-19, which include the following:

- Coughing;
- Fever;
- Shortness of breath, difficulty breathing; and
- Early symptoms such as chills, body aches, sore throat, headache, diarrhea, nausea/vomiting, and runny nose.

If you develop a fever and symptoms of respiratory illness, such as cough or shortness of breath, DO NOT GO TO WORK and call your supervisor and healthcare provider right away. Likewise, if you come into close contact with someone showing these symptoms, call your supervisor and healthcare provider right away.

NOTE: If an employee has tested POSITIVE for COVID-19, they are required to be tested twice (tests 24 hours apart) with NEGATIVE test results before returning to work.

COVID-19 Health Assessment

1. Are you currently experiencing, or recently experienced, any acute respiratory illness symptoms such as fever, cough, or shortness of breath?
2. Have you been in close contact with any person who has been confirmed positive for COVID-19?
3. Have you been in close contact with any person who may have COVID-19, but is yet to be confirmed?
4. Have you been in close contact with any person, such as a family member, who is experiencing symptoms or has been confirmed positive with COVID-19?
5. Have you traveled internationally in the last 14 days?

If you answer **YES** to any of the questions above, **DO NOT** come to the job-site.

1.4 Site Security and Access

Access to the Project Job Site is restricted to authorized personnel only. All employees, subcontractors, suppliers and visitors must report to the Inovateus trailer to sign-in and receive a site safety orientation.

Site visitors will be required to give a 48-hour notice prior to their arrival and check-in at the site trailer when they arrive. Site visitors will be given a brief site safety orientation and PPE requirements.

Cameras or other electronic equipment may not be used without prior approval from the Construction Manager and Client's Project Manager.

No weapons of any kind are allowed on site.

1.4.1 Security of Personnel and Assets

Site security is vital for protecting not only equipment and other valuable assets, but protects on-site personnel as well.

The Inovateus Solar Construction Manager and Inovateus Solar Project Manager are responsible for ensuring that tools, vehicles, equipment, computers and facilities are secured at the end of the workday. Thefts and vandalism are crimes of opportunity that can often be prevented by removing the keys from vehicles and equipment, locking office doors, securing supplies and equipment and providing exterior lighting. Under certain circumstances and when authorized by the client, private security patrols may be provided.

1.4.2 Workplace Violence

Inovateus Solar has a zero-tolerance policy towards acts of workplace violence. Inovateus Solar will not tolerate threats, threatening behavior, harassment, stalking, or any other acts of violence against any of its employees, or any other person on Inovateus Solar job sites by anyone, including members of the public and an employee's family or household members.

Any individual who makes threats, stalks, displays threatening behavior, or commits violent acts on Inovateus Solar job sites shall be removed from the premises as quickly as safety permits, and law enforcement will be immediately contacted. Inovateus Solar will respond to the behavior based on the needs of the affected employees and in a manner that protects all job site personnel and eliminates the threat of further such acts, to the extent possible.

Job site personnel shall assist Inovateus Solar in maintaining a violence-free workplace by reporting warning signs or incidents of violent behavior immediately to their supervisor. All reports will be investigated and kept strictly confidential.

All job site personnel are responsible for making this report regardless of the relationship between the individual who initiated the behavior and the person(s) who were threatened or were the focus of the threatening behavior.

1.5 Site Safety and PPE Requirements

All authorized site personnel will:

- Understand and comply with all applicable regulations, standards, and requirements
- Follow the requirements of the Site-Specific Health and Safety Plan
- Follow safe work and conduct practices at all times
- Wear the appropriate Personal Protective Equipment (PPE) at all times
- Use the appropriate tools and equipment required for the job in the way they were meant to be used
- Operate machinery and equipment only if qualified and authorized to do so
- Remove from service any defective or malfunctioning tools, equipment, structures, and protective clothing
- Refuse to perform work that may cause imminent danger to one's self or others
- Report all unsafe conditions or conduct immediately to their Foreman and the Inovateus Project Safety Manager
- Keep the workplace tidy and safe
- Report any near misses, injuries, illnesses, or property damage immediately
- Report to work in a condition to perform his/her job in a safe, competent manner

1.6 Project Safety Kick-Off Meeting

A project safety kick-off meeting to review this site-specific health and safety plan shall be held before commencing any construction. All personnel directly involved with the Project Job Site will attend and acknowledge attendance to this meeting. This meeting will establish:

- Project safety objectives
- COVID-19 requirements
- Subcontractor Foreman safety responsibility
- General safety and conduct rules
- Fall protection methods
- First aid requirements, emergency phone numbers and map to nearest Urgent Care Center
- Fire hazard protection requirements
- Safety orientation requirements
- Potential hazards and special conditions
- Inclement weather response procedures
- Hazardous chemicals and required SDS sheets
- Essential coordination requirements with the site host
- Staging plan
- Delivery schedule and procedures

Upon completion of this meeting, attending personnel will receive a safety sticker for their hard hat that identifies them as having attended this meeting. New personnel to the site must be given the same site-specific project safety orientation prior to beginning any work.

2 Management Commitment to Safety

Our Health and Safety Program, and specific individual programs, have been developed to assure compliance with federal, state, and local regulations. We believe all accidents are preventable. Therefore, we will make every effort to prevent accidents and comply with all established safety and health laws and regulations.

3 Inovateus Health and Safety Policy

Inovateus Solar is committed to an Occupational Health and Safety (OHS) program that provides a safe and healthy work environment for all of its employees, subcontractors, and customers. Inovateus Solar will follow operating practices that will safeguard employees, the public and company operations.

The safety objective for lost time and medical aid injuries by personnel on Inovateus Solar facilities and Inovateus Solar project sites is set at ZERO. A teamwork approach focusing on a cooperative effort between management, employees, subcontractors, and site owners is essential in order to meet this objective. Every person, to the highest level of management, must exert every effort to eliminate personal injury, equipment loss, or damage to facilities.

In order to achieve this, Inovateus Solar management and staff will:

- Demonstrate leadership and commitment through all its managers and supervisors.
- Provide and maintain a working environment that is safe and without risk to health, and provide appropriate facilities for welfare from the start of all projects.
- Establish measurable objectives and goals to ensure continued improvement aimed at elimination of work-related injury and illness.
- Ensure that there are clear lines of communication between management and on-site operations, and that this Policy is made available to all interested parties.
- Ensure that adequate arrangements are put in place for the effective planning, development and review of this Health and Safety Policy.
- Ensure that the Policy and implementation of the arrangements are monitored and reviewed on a regular basis and that they reflect the Company's performance objectives and targets, and to ensure continuous improvement.

Safety is never an accident. It is always the result of high intention, sincere effort, intelligent direction and skillful execution. It represents the wise choice of many alternatives.

John Jackson
COO, Inovateus Solar

(Signature) 02/17/2022 (Date)

4 Objective

All work practices and procedures implemented on site will be designed to minimize associate contact with hazardous materials and to reduce the possibility of physical injury. The Inovateus PM, FPM and Project Safety Manager shall ensure that all subcontractors comply with federal, state, local, and client site safety rules and regulations as well as their own safety programs. All work will be performed in accordance with the following:

- Occupational Safety and Health Administration (OSHA) regulations found in Title 29 of the Code of Federal Regulations (CFR) Parts 1910 and 1926
- National Institute for Occupational Safety and Health (NIOSH) Publications 85-115
- American Conference of Governmental Industrial Hygienists (ACGIH) Publication Threshold Limit Values and Biological Exposure Indices
- US Environmental Protection Agency (EPA) Publication No. PB9285.1-03
- American National Standards Institute (ANSI) guidelines (various)

4.1 Modifications to the Site-Specific Health and Safety Plan

The procedures and guidelines contained herein were based upon the best available information at the time of the plan's preparation. Specific requirements will be revised when new information is

received or conditions change. Any amendments to this plan will be documented and approved by the Sr VP of Corporate Safety and the onsite Field Project Manager.

4.2 Application of Behavior Based Safety (BBS)

Behavior Based Safety (BBS) is utilized to prevent or reduce losses and safety incidents using tools and management techniques to achieve a safe work environment. This is accomplished by focusing on work activities and behaviors and identifying and eliminating hazards before an incident occurs. BBS is implemented as follows:

- Job Hazard Analysis (JHA) – developed for all major work tasks and processes, reviewed before the task is done (daily, if applicable,) and updated or revised as needed to address changes in the workplace, equipment, personnel, etc.

4.3 Stop Work Authority

All on-site personnel are empowered, are expected, and have the responsibility to stop their own work and the work of co-workers, client employees, or other contractors if any person's safety or the environment is at risk. NO repercussions will result from this action.

Site or project conditions that are possible reasons to stop work and to consider modifications to the Site-Specific Health and Safety Plan include:

- Deviation from planned work activities. The deviation must be discussed and approved by the Project Manager and the Field Project Manager before work can proceed.
- Recognition of new or unidentified hazards
- Site temperatures (possibly resulting in greater risk of heat or cold stress)
- PPE breakthrough or unexpected degradation
- Unusual odors that can't be identified

This list is not a comprehensive list and should be used only as guidance.

4.4 Subcontractor Coordination

Supporting the Inovateus Site-Specific Health and Safety Plan is a requirement for all subcontractor personnel. Inovateus' Site-Specific Health and Safety Plan will be made available for review and will be adopted by the subcontractor. This plan is applicable to the subcontractors insofar as Inovateus will be directing the work. If subcontractors perform work not addressed in Inovateus' Site-Specific Health and Safety Plan, a pre-task meeting shall be held to define the scope of work, hazards, mitigations, responsible personnel, and safe work procedures. The subcontractor will provide Inovateus with a copy of their Health and Safety Plan and/or safe work procedures and JHA's applicable to the job tasks being performed.

All subcontractors will:

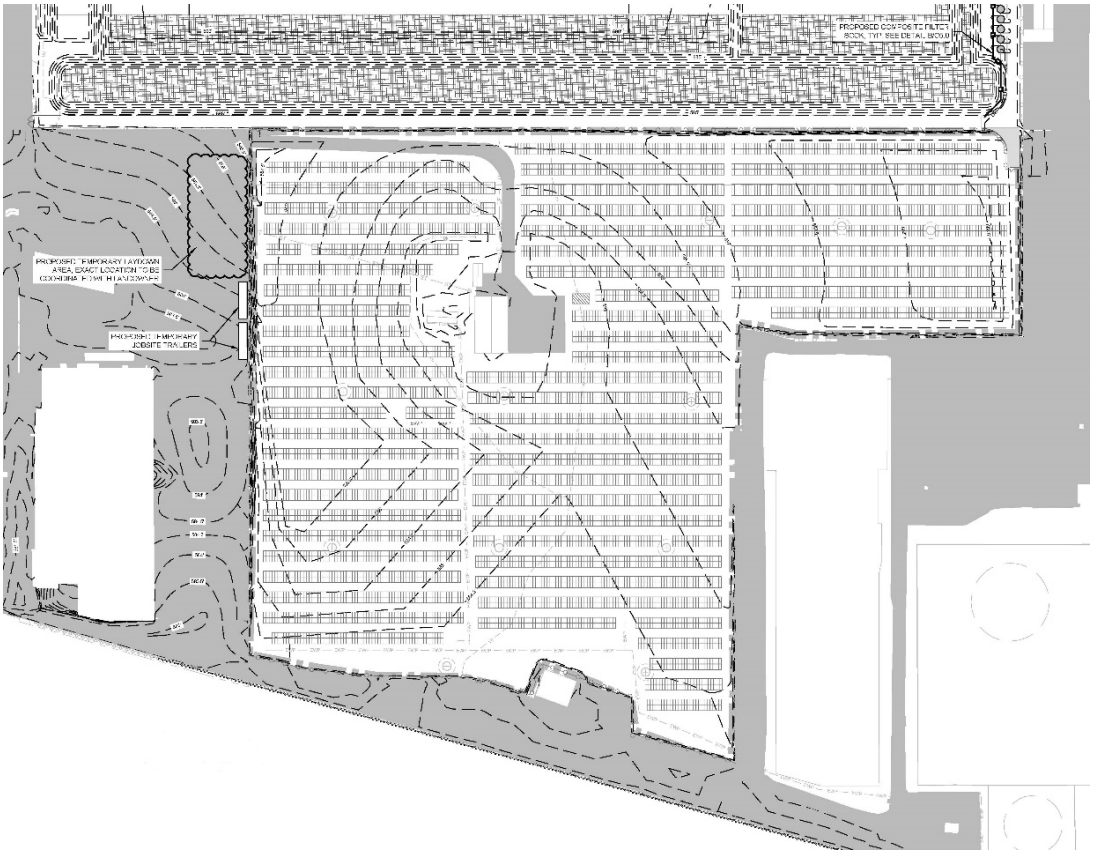
- Participate in site safety meetings and safe work practices.
- Supply their own PPE and other safety equipment.
- Be responsible for the safety and wellbeing of their personnel and the condition and maintenance of their equipment, vehicles, and tools.
- Engage in pre-task meetings with the Inovateus Field Project Manager and Project Safety Manager to establish scope of work, hazard assessment, mitigation actions, and responsible persons.

5 Scope of Work

The scope of work includes work associated with constructing a 3.6 MW DC ballasted mount solar array on approximately 11 acres of a capped brownfield in Erie County, New York. The solar installation will consist of 1 fenced in array located south of Elk Street, bordered by Babcock Street to the west and Buckeye Terminals to the east. This Plan covers the following construction components:

- Mobilization
- Perimeter Fencing
- Civil Installation
- Construction of Solar Array (Mechanical & Electrical)
- Restoration

5.1 Site Plan



6 Safety Plan-at-a-Glance

6.1 Mobilization

Acknowledgements - *See table of emergency contacts for telephone numbers.*

Responsibility	Name	Signature	Date
Inovateus Construction Manager	Joaquin Corona	DocuSigned by: 58EFEE42E36542F...	1/15/2024 | 9:00 A

This summary is provided for a quick reference for field activities at the project site. The remainder of this site-specific health and safety plan provides general health and safety procedures that must be adhered to while conducting work at the project site. Procedures for updating or amending this site-specific health and safety plan are outlined in Section 4.1.

Project Activities

Mobilization includes establishment of the field office, mobilizing equipment to the work area, locating utilities, and reviewing existing site conditions. Most activities will be performed in and around the area designated for Inovateus support activities.

Hazard Analysis

Mobilization activities could be affected by the following physical hazards:

- Exposure to nuisance dust
- Pinch points/sharp objects
- Noise
- Vehicle traffic
- Slip, trips, falls
- Heavy lifting
- Fires
- Weather, including heat or cold stress
- Underground and overhead utilities
- Uneven terrain
- Hand injuries

Mobilization activities could be affected by the following biological hazards:

- Insect bites and stings
- Poisonous plants
- Snakes

Minimum Protective Clothing and Equipment Requirements

Level D personal protective equipment (PPE) is anticipated for this task and is defined below.

Level D PPE	
Protective Gear	**Type**
Respiratory protection	None

Hand protection: inner gloves	None
Hand protection: outer gloves	None
Foot protection: inner boots	Safety toe, leather work boots
Foot protection: outer boots	None; metatarsal guards
Head protection	Standard hard hat
Eye protection	Standard safety glasses with side shield or goggles
Splash protection	Standard face shield
Other protective clothing	High visibility, reflective vest or class 3 shirt
Hearing protection	Ear plugs or muffs with NRR of at least 25
Associates may wear Tyvek or similar coveralls as protection from ticks and insects.	

Engineering and Administrative Controls

All activities will be conducted in accordance with provisions outlined in Section 9. All field personnel will notify the site Inovateus Construction Manager (CM) when reporting for and leaving work by signing in at the on-site trailer.

Fire extinguishers must be available in the trailer and each vehicle or piece of equipment.

Dust suppression will be accomplished using water trucks to keep dust levels low.

6.2 Construction of the Solar Array

Acknowledgements - *See table of emergency contacts for telephone numbers.*

Responsibility	Name	Signature	Date
Inovateus Director of Project Management	Todd Collins	DocuSigned by: Todd Collins 6BD858F1A601419...	1/23/2024 | 11:19 A
Inovateus Construction Manager	Joaquin Corona	DocuSigned by: 58EFEE42E36542F...	1/15/2024 | 9:00 A
Inovateus Project Manager	Megan Drean	DocuSigned by: Megan Drean DC48D49B8E6444A...	1/12/2024 | 1:50 P
Civil Subcontractor (Milestone Construction)	Matthew Beres	DocuSigned by: Matthew Beres B810F65988ED447...	1/15/2024 | 3:02 P
Electrical Subcontractor (Schuler-Haas)	Devyn Smith	DocuSigned by: Devyn Smith 6C6A8462C0F4489...	1/15/2024 | 3:16 P
Mechanical Subcontractor (LBFNY)	Bryan Lampson	DocuSigned by: Bryan Lampson 6DBFB77E41C5474...	1/15/2024 | 3:43 P

Fencing Subcontractor	Christine Watt	DocuSigned by: Christine Watt C18A01424C0E43B...	1/20/2024 | 5:51
Surveying GPI	Mark Andrews	DocuSigned by: Mark Andrews 7D5F9C1FF4F046F...	1/22/2024 | 1:28

This summary is provided for a quick reference for field activities at the project site. The remainder of this site-specific health and safety plan provides general health and safety procedures that must be adhered to while conducting work at the project site. Procedures for updating or amending this site-specific health and safety plan are outlined in Section 4.1.

Project Activities

Solar Array Construction includes establishment of an access road, staging area, and construction of the array itself. This task will be conducted in accordance with project specification and will utilize heavy equipment (skid steer, fork lift, utility vehicle, crane, and tugger).

Hazard Analysis

Solar Array Construction activities could be affected by the following physical hazards:

- Exposure to nuisance dust
- Pinch points/sharp objects
- Noise
- Vehicle traffic
- Slip, trips, falls
- Heavy lifting
- Fires
- Weather, including heat or cold stress
- Underground and overhead utilities
- Uneven terrain
- Hand injuries
- Thunderstorms (tornado, flash flood)
- Penetration of brownfield cap

Solar Array Construction activities could be affected by the following biological hazards:

- Insect bites and stings
- Poisonous plants
- Snakes

Minimum Protective Clothing and Equipment Requirements

Level D personal protective equipment (PPE) is anticipated for this task and is defined below.

Level D PPE	
Protective Gear	**Type**
Respiratory protection	None
Hand protection: inner gloves	None
Hand protection: outer gloves	CUT3 rated work gloves as needed

Foot protection: inner boots	Safety toe, leather work boots
Foot protection: outer boots	None; metatarsal guards
Head protection	Standard hard hat
Eye protection	Standard safety glasses with side shield or goggles
Splash protection	Standard face shield
Other protective clothing	High visibility, reflective vest or class 3 shirt
Hearing protection	Ear plugs or muffs with NRR of at least 25
Associates may wear Tyvek or similar coveralls as protection from ticks and insects.	

Engineering and Administrative Controls

All activities will be conducted in accordance with provisions outlined in Section 9. All field personnel will notify the site Inovateus Field Project Manager (FPM) when reporting for and leaving work by signing in at the on-site trailer.

Fire extinguishers must be available in the trailer and each vehicle or piece of equipment.

Dust suppression will be accomplished using water trucks to keep dust levels low.

6.3 Construction of Overhead Lines

Acknowledgements - *See table of emergency contacts for telephone numbers.*

Responsibility	Name	Signature	Date
Inovateus Construction Manager	Joaquin Corona	DocuSigned by:	1/15/2024 | 9:00 A
Electrical Subcontractor (Schuler-Haas)	Devyn Smith	DocuSigned by: 68EFEEF42E36542F... Devyn Smith 6C6A8462C0F4489...	1/15/2024 | 3:16 P

This summary is provided for a quick reference for field activities at the project site. The remainder of this site-specific health and safety plan provides general health and safety procedures that must be adhered to while conducting work at the project site. Procedures for updating or amending this site-specific health and safety plan are outlined in Section 4.1.

Project Activities

This task involves the construction of the overhead lines. This includes erection of the poles, attachment of equipment, and associated overhead line work. All spoils resulting from pole drilling are to be redeposited at the base of each pole once erected. A combination of heavy equipment (bucket truck, mini-excavator, skid steer, power auger) and manual labor will be utilized to accomplish this task.

Hazard Analysis

Overhead Line Construction activities could be affected by the following physical hazards:

- Exposure to nuisance dust
- Pinch points/sharp objects
- Noise
- Vehicle traffic
- Slip, trips, falls
- Heavy lifting
- Fires
- Weather, including heat or cold stress
- Underground and overhead utilities
- Uneven terrain
- Hand injuries
- Thunderstorms

Overhead Line Construction activities could be affected by the following biological hazards:

- Insect bites and stings
- Poisonous plants
- Snakes

Minimum Protective Clothing and Equipment Requirements

Level D personal protective equipment (PPE) is anticipated for this task and is defined below.

Level D PPE

Protective Gear	Type
Respiratory protection	None
Hand protection: inner gloves	None
Hand protection: outer gloves	CUT3 rated work gloves as needed
Foot protection: inner boots	Safety toe, leather work boots
Foot protection: outer boots	None; metatarsal guards
Head protection	Standard hard hat
Eye protection	Standard safety glasses with side shield or goggles
Splash protection	Standard face shield
Other protective clothing	High visibility, reflective vest or class 3 shirt
Hearing protection	Ear plugs or muffs with NRR of at least 25
Associates may wear Tyvek or similar coveralls as protection from ticks and insects.	

Engineering and Administrative Controls

All activities will be conducted in accordance with provisions outlined in Section 9. All field personnel will notify the site Inovateus Field Project Manager (FPM) when reporting for and leaving work by signing in at the on-site trailer.

Fire extinguishers must be available in the trailer and each vehicle or piece of equipment.

Dust suppression will be accomplished using water trucks to keep dust levels low.

6.4 Restoration

Acknowledgements - *See table of emergency contacts for telephone numbers.*

Responsibility	Name	Signature	Date
Inovateus Construction Manager	Joaquin Corona	DocuSigned by: 58EFEE42E36542F...	1/15/2024 | 9:00 A
Civil Subcontractor (Milestone Construction)	Matthew Beres	DocuSigned by: Matthew Beres B810F65988ED447...	1/15/2024 | 3:02 P

This summary is provided for a quick reference for field activities at the project site. The remainder of this site-specific health and safety plan provides general health and safety procedures that must be adhered to while conducting work at the project site. Procedures for updating or amending this site-specific health and safety plan are outlined in Section 4.1.

Project Activities

Restoration includes seeding and resurfacing of turf areas impacted by construction of the solar arrayand overhead line work. This task will be conducted in accordance with project specification and will utilize heavy equipment (skid steer, wheel loader, seeding equipment) and manual labor to accomplish this task.

Restoration activities could be affected by the following physical hazards:

- Exposure to nuisance dust
- Pinch points/sharp objects
- Noise
- Vehicle traffic
- Slip, trips, falls
- Heavy lifting
- Fires
- Weather, including heat or cold stress
- Underground and overhead utilities
- Uneven terrain
- Hand injuries
- Thunderstorms

Restoration activities could be affected by the following biological hazards:

- Insect bites and stings
- Poisonous plants
- Snakes

Minimum Protective Clothing and Equipment Requirements

Level D personal protective equipment (PPE) is anticipated for this task and is defined below.

Level D PPE	
Protective Gear	**Type**
Respiratory protection	None
Hand protection: inner gloves	None
Hand protection: outer gloves	CUT3 rated work gloves as needed
Foot protection: inner boots	Safety toe, leather work boots
Foot protection: outer boots	None; metatarsal guards
Head protection	Standard hard hat
Eye protection	Standard safety glasses with side shield or goggles
Splash protection	Standard face shield
Other protective clothing	High visibility, reflective vest or class 3 shirt
Hearing protection	Ear plugs or muffs with NRR of at least 25
Associates may wear Tyvek or similar coveralls as protection from ticks and insects.	

Engineering and Administrative Controls

All activities will be conducted in accordance with provisions outlined in Section 9. All field personnel will notify the site Inovateus Field Project Manager (FPM) when reporting for and leaving work by signing in at the on-site trailer.

Fire extinguishers must be available in the trailer and each vehicle or piece of equipment.

Dust suppression will be accomplished using water trucks to keep dust levels low.

6.5 Maintenance

Acknowledgements - *See table of emergency contacts for telephone numbers.*

Responsibility	Name	Signature	Date
Inovateus Director of Project Management	Todd Collins	DocuSigned by: Todd Collins 6BD858F1A601419...	1/23/2024 | 11:19
Inovateus Construction Manager	Joaquin Corona	DocuSigned by: 58EFEE42E36542F...	1/15/2024 | 9:00 A
Inovateus Project Manager	Megan Drean	DocuSigned by: Megan Drean DC48D49B8E6444A...	1/12/2024 | 1:50 P
Civil Subcontractor (Milestone Construction)	Matthew Beres	DocuSigned by: Matthew Beres B810F65988ED447...	1/15/2024 | 3:02 PM
Electrical Subcontractor (Schuler-Haas)	Devyn Smith	DocuSigned by: Devyn Smith 6C6A8462C0F4489...	1/15/2024 | 3:16 P
Mechanical Subcontractor (LBFNY)	Bryan Lampson	DocuSigned by: Bryan Lampson 6DBFB77E41C5474...	1/15/2024 | 3:43 PM
Fencing Subcontractor	Christine Watt	DocuSigned by: Christine Watt C18A01424C0E43B...	1/20/2024 | 5:51 PM

This summary is provided for a quick reference for field activities at the project site. The remainder of this site-specific health and safety plan provides general health and safety procedures that must be adhered to while conducting work at the project site. Procedures for updating or amending this site-specific health and safety plan are outlined in Section 4.1.

Project Activities

This task includes maintenance of the access road, staging area, and solar array. This task will be conducted in accordance with project specification and will utilize heavy equipment (skid steer) and manual labor to accomplish this task.

Maintenance activities could be affected by the following physical hazards:

- Exposure to nuisance dust
- Pinch points/sharp objects
- Noise
- Vehicle traffic
- Slip, trips, falls
- Heavy lifting
- Fires
- Weather, including heat or cold stress
- Underground and overhead utilities
- Uneven terrain
- Hand injuries
- Thunderstorms

Maintenance activities could be affected by the following biological hazards:

- Insect bites and stings

- Poisonous plants
- Snakes

Minimum Protective Clothing and Equipment Requirements

Level D personal protective equipment (PPE) is anticipated for this task and is defined below.

Level D PPE	
Protective Gear	**Type**
Respiratory protection	None
Hand protection: inner gloves	None
Hand protection: outer gloves	CUT3 rated work gloves as needed
Foot protection: inner boots	Safety toe, leather work boots
Foot protection: outer boots	None; metatarsal guards
Head protection	Standard hard hat
Eye protection	Standard safety glasses with side shield or goggles
Splash protection	Standard face shield
Other protective clothing	High visibility, reflective vest or class 3 shirt
Hearing protection	Ear plugs or muffs with NRR of at least 25
Associates may wear Tyvek or similar coveralls as protection from ticks and insects.	

Engineering and Administrative Controls

All activities will be conducted in accordance with provisions outlined in Section 9. All field personnel will notify the site Inovateus Field Project Manager (FPM) when reporting for and leaving work by signing in at the on-site trailer.

Fire extinguishers must be available in the trailer and each vehicle or piece of equipment.

Dust suppression will be accomplished using water trucks to keep dust levels low.

7 Assignment of Responsibilities

7.1 Inovateus Project Manager

The Project Manager will report directly to the client and ensure all project members strive for zero incidents. The responsibilities of the Project Manager will be the successful completion of the project, but the number one goal will be a safe and healthy work site with zero incidents.

7.2 Inovateus Field Project Manager

The Inovateus Field Project Manager (FPM) will be responsible for directing all site personnel, equipment, subcontractors, and activities to ensure a safe and successful implementation of the on-site activities. The FPM will have overall responsibility for the health and safety of site personnel which will include the following:

- The FPM will ensure adequate resources are provided to carry out established health and safety responsibilities,
- will enforce the Site-Specific Health and Safety Plan,
- will ensure proper communications are established for emergency response,
- will coordinate the planning and implementation of all site activities,
- and ensure site personnel are knowledgeable of site hazards.

7.3 Job-Site QC/Closeout Engineer

The QC/Closeout Engineer assists with and monitors quality control activities (inspections/observations) which directly affect customer requirements and final completion. He also oversees and coordinates all project commissioning and closeout activities associated to Mechanical Completion, Substantial Completion and Final Completion.

- The QC/Closeout Engineer will coordinate QC activities, resolve quality issues and monitor project progress,
- will approve all finished commissioning activities by confirming specifications and conducting required tests,
- will document and update inspection results by completing reports and logs,
- and approve in-process activities (Quality at the Source) by confirming required specifications, conducting visual and measurement tests, and communicating the required adjustments to the Project Manager and FPM.

7.4 Job-Site Field Project Supervisor

The Inovateus Field Project Supervisor will mirror the FPM's responsibilities in assigned areas by directing site personnel, equipment, subcontractors, and activities to ensure a safe and successful implementation of the on-site activities. The Field Project Supervisor will be responsible for the health and safety of site personnel in assigned area which will include the following:

- The Field Project Supervisor will ensure adequate resources are provided to carry out established health and safety responsibilities,
- will enforce the Site-Specific Health and Safety Plan,
- will ensure proper communications are established for emergency response,
- will coordinate the planning and implementation of assigned area's activities,
- and ensure personnel are knowledgeable of site hazards.

7.5 Job-Site Project Safety Manager

Working under the direction of the FPM, the Job-Site Project Safety Manager has the authority to provide job-site safety leadership and ensures project compliance with OSHA safety standards, implements safety directives, improves safety performance, and ensures on-site safety policies and procedures are aligned with customer's safety plan by performing the following:

Essential Duties and Responsibilities include the following. Other duties may be assigned.

- Identify best practices and lead continuous improvement initiatives to reduce work process risks, raise safety awareness, and improve safe work practices.
- Facilitate a work environment that supports a safe and healthy culture.
- Perform safety audits and inspects job-site, machinery, and safety equipment to identify and correct potential hazards, and to ensure safety regulation compliance.
- Investigate accidents, near-miss incidents, property damage incidents and occupational injuries to determine causes, and install preventive measures.
- Work within company policy as outlined in the Inovateus Solar's Health & Safety Program Handbook, this Job-Site Specific Health and Safety Plan, and in compliment with customer job-site Safety Manual and OSHA Safety rules.

7.6 Inovateus Subcontractors

Subcontractors shall establish and maintain an effective safety and health program that at the least equals that of the Inovateus Solar's Safety and Health Program. The subcontractor shall be solely responsible for implementing the safety program and shall have sole responsibility for monitoring the work of its employees, subcontractors, agents, vendors and suppliers to ensure compliance.

7.6.1 Designation of Competent Person

Each subcontractor shall designate a competent person as defined by OSHA to implement and enforce the safety requirements. A competent person from each subcontractor must be on site whenever they have employees working on site, and the name of that person shall be submitted on the Inovateus Solar Daily Report. Each subcontractor is required to maintain this position, and a competent person[s] will remain on-site until the completion of their work. The subcontractor shall not relinquish or defer responsibility for project safety to his own or subcontractor employees at any time under any circumstances. Inovateus Solar may require the subcontractor to employ a full-time qualified safety representative.

7.6.2 Communication

Each Inovateus subcontractor is responsible for consistently completing their work in a safe manner with a common goal of zero incidents, asking questions if the task is not understood, and communicating the Site-Specific Health and Safety Plan to their employees. Each subcontractor will also be responsible for the following:

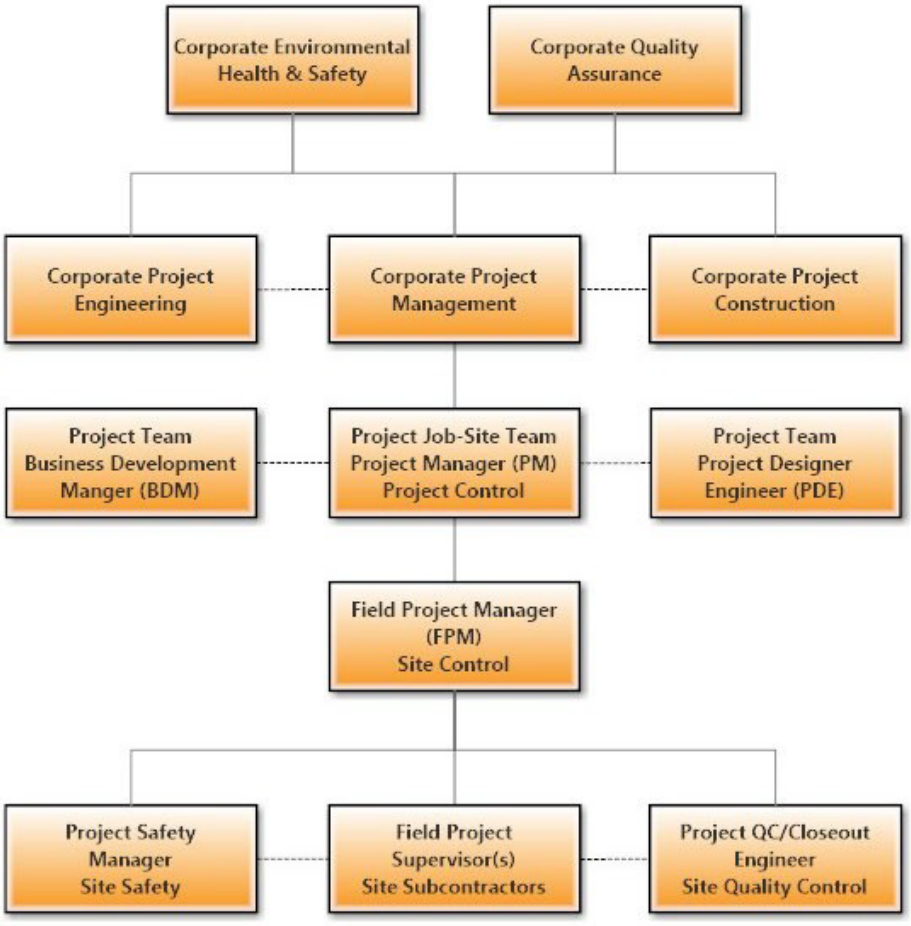
- Report any unsafe or potentially hazardous conditions to the Project Safety Manager
- Comply with rules, regulations, and procedures as set forth in this Site-Specific Health and Safety Plan
- Express safety ideas or concerns in the daily safety meetings
- Perform a JHA before performing any task
- Utilize "Stop Work Authority" if required

By signing the Health and Safety Plan Acknowledgment Form, subcontractors are recognizing the potential hazards present on-site and the policies and procedures required to minimize exposure and/or adverse effects of these hazards.

In addition to following the Site-Specific Health and Safety Plan, subcontractors are obligated to abide by Inovateus' Subcontractor Site Safety Requirements and Procedures defined under separate cover.

7.7 Other Job-Site Personnel

Examples of other personnel that may be on site include representatives of the Federal, State, and county agencies, other Inovateus employees, as well as Inovateus' client. Any person who observes safety problems should immediately report observations or concerns to appropriate key personnel. Although other personnel typically only make on-site observations, they will be expected to read and abide by the Site-Specific Health and Safety Plan, and receive a documented site orientation. Should the above-mentioned personnel refuse to abide by site safety requirements, work will be stopped while these personnel are on site. Every Inovateus associate has the authority and obligation to stop work to prevent incidents and injuries.



Project Organizational Chart

8 Training and Monitoring Requirements

8.1 Site-Specific Training

All job site personnel will receive instruction on this Site-Specific Health and Safety Plan as part of the Project orientation. The instructions will cover the contents of this Health and Safety Plan, including roles and responsibilities, a review of job hazard analysis, and safe work practices. The site's emergency response and evacuation practices will be reviewed as well.

Additional training must be provided:

- when there are any changes to the plan or facility, and
- when an employee's responsibilities change.

Items for review during the training include:

- PPE requirements,
- proper housekeeping,
- individual responsibilities,
- Emergency Action Plan,
- equipment being used,
- site layout,
- locations of fire extinguishers, eye wash stations, and first aid locations,
- reporting of all incidents, including vehicle or equipment damage,
- daily safety meetings,
- hazards associated with working near overhead or underground utilities, and
- hazardous chemicals present at the site.

Attendance at tailgate safety meetings, which are held each morning, is also required. Topics of the tailgate safety meetings will include a discussion of that day's activities and the potential hazards which may be encountered. The Inovateus Project Safety Manager or designee will lead the meetings and record the topic(s) discussed. All field team members are required to sign-in to document their attendance. Meeting topics will include pertinent safety information.

9 Job Site Hazard Analysis

While not all potential site hazards can be identified during site-specific safety development, many can be anticipated. This section discusses the anticipated hazards and offers controls to minimize risk.

9.1 Chemical Hazards

The use of chemicals is anticipated to be minimal at the site. A brief list is included below of certain chemicals that may be necessary. Any additional chemicals used will be added to the list and the SDS will be added to the SDS folder located at the Inovateus project trailer or administrative offices.

- Gasoline
- Diesel
- Hydraulic Oil
- Motor Oil
- Petroleum Grease

SDS will be discussed at the initial site safety orientation and daily safety meetings as applicable. Site personnel will comply with OSHA Hazard Communication Standards (Right-To-Know) and Inovateus Hazard Communication Program. All containers received on site will be inspected by the FPM/Designee.

OSHA and the EPA have established a chemical safety data bank for quick reference to over 800 chemicals. While this does not replace the need for an SDS, it is a quick reference for chemical safety and PEL information.

9.2 Non-Chemical Hazards

Physical hazards, such as those associated with excavation, heavy equipment, debris removal, and other construction activities, will likely pose the greatest potential for injury at the site. Physical hazards can be caused by the following:

- Underground and overhead utilities
- Heavy equipment
- Noise
- Weather
- Slip, trip, and fall
- Fire protection
- Debris removal
- Traffic
- Water hazards
- Hazardous energy sources (lock-out/tag-out)
- Hand injury hazards
- Hot work
- Unique site-specific hazards

Injuries that may result from these physical hazards can range from simple slip-trip-fall types of incidents to casualties, including fatalities due to moving or rotating equipment, electrocution, engulfment, or other activities related to construction. If there is any deviation from planned work activities, stop work authority must be initiated immediately. The deviation must be discussed and approved by the FPM before work can proceed.

Each of the above-mentioned physical hazards are discussed below.

9.2.1 Underground and Overhead Utilities

Before heavy equipment is used, all utilities (electric, natural gas, water, sewer lines, etc.) must be identified. Inovateus will contact the Nationwide Underground Utility Locate Center at 811 for locating utilities and pipelines on the property. Each day before work begins utility locations will be discussed as they relate to planned activities. Deviation from planned activities must be discussed and approved by the FPM. Additional training that addresses working around high voltage overhead electrical lines will be completed in the site orientation.

CALL BEFORE YOU DIG

YOU MUST CALL FOR A FREE MARKOUT THREE FULL BUSINESS DAYS BEFORE YOU DIG

811

9.2.1.1 Power Line Safety for Motor Vehicles and Mechanized Equipment

Power line safety for motor vehicles and mechanized equipment shall comply with 29 CFR 1926.600(a)(6). The operation of equipment including excavators, dump trucks, loaders, and motor vehicles, in the vicinity of overhead utilities shall comply with the following requirements when working or being moved in the vicinity of power lines or energized transmitters, except where electrical distribution and transmission lines have been de-energized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines:

MOTOR VEHICLES AND MECHANIZED EQUIPMENT SAFE WORKING DISTANCES		
Line Voltage	**Required Clearance**	**Comments**
50 kV or less	10 feet	Based on 1926.600(a)(6)
> 50 kV to 345 kV	10 feet + 0.4 inch for additional kV above 50	Example for 60 kV clearance is 10 feet + 4 inches
> 345 kV to 750 kV	16 feet	
IN TRANSIT NO LOAD BOOM LOWERED SAFE DISTANCES		
< 50 kV	4 feet	Based on 1926.600(a)(6)(iii)
50 kV to 345 kV	10 feet	
>345 kV to 750 kV	16 feet	

9.2.1.2 Power Line Safety for Cranes

Although not anticipated for this project, power line safety for cranes shall comply with 29 CFR 1926.1408.

CRANES MINIMUM SAFE WORKING DISTANCES		
Line Voltage	**Minimum Clearance**	**Comments**
Up to 50 kV	10 feet	Based on 1926.1408 Table A
Over 50 to 200 kV	15 feet	
Over 200 to 350 kV	20 feet	
Over 350 to 500 kV	25 feet	
Over 500 to 750 kV	35 feet	
Over 750 to 1000 kV	45 feet	
Over 1000 kV	As established by utility owner or PE	

9.2.1.3 Additional Requirements for Working Near Power Lines

(1) A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means;

(2) Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other regulation of 29 CFR 1926.600 even if such device is required by law or regulation;
(3) Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded;
(4) Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be de-energized or tests shall be made to determine if electrical charge is induced on the crane. The following precautions shall be taken when necessary to dissipate induced voltages:
    a. The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom; and
    b. Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews shall be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.
    c. Combustible and flammable materials shall be removed from the immediate area prior to operations.

In addition to the above information:

(1) Equipment shall be operated no closer than 15 feet to a power line except when the lines have been de-energized, visibly grounded and LO/TO procedures have been implemented or barriers are present to prevent physical contact with the lines.
(2) Where spacing does not provide 15 feet of clearance in the fall radius area for the height of the equipment plus appendages, de-energize or ensure that work crews are trained in recognizing the extraordinary electrical hazards prior to starting work.
(3) Post "CAUTION – ENERGIZED OVERHEAD POWER LINE" sign to warn against potential overhead power line hazards or unsafe practices.
(4) Conduct tailgate safety meeting on electrical and rig safety. Identify hazardous energy sources and proper lock-out/tag-out procedures (i.e., electrical, mechanical, hydraulic, pneumatic, chemical, and thermal).
(5) Review emergency response plan.

9.2.2 Heavy Equipment

Heavy equipment and its operation can represent a significant safety hazard if proper experience is not combined with site-required procedures. Only trained and experienced personnel will operate heavy equipment. Equipment will have a fire extinguisher on board, audible backup alarm, and spill kit.

Equipment Requirements

All self-propelled construction equipment shall be maintained, equipped and operated in accordance with all OSHA and manufactures' requirements. Material handling equipment [as defined by OSHA] shall be equipped with Roll-over Protective Structures (ROPS) and seat belts.

- Only authorized and trained personnel shall operate equipment.
- Cell phone use is prohibited while operating a piece of equipment.

- Equipment operators and truck drivers shall make a pre-shift safety inspection of their equipment. Any conditions that effect safe operation shall be corrected before use.
- Personnel shall not be transported or ride on equipment or vehicles that are not equipped with seats for passengers. Riding in the back of pickup trucks or on equipment without the use of a seatbelt is prohibited.

9.2.3 Trenching and Excavation

All excavation and trenching activities shall be made in accordance with the rules, regulations, requirements, and guidelines set forth in 29 CFR 1926.650, .651, and .652, the Occupational Safety and Health Administration's standards on Excavations. A competent person (Field Project Manager, supervisor) shall be placed in charge of all excavations.

Most solar installation require very little excavations or trenching that would fall within the 4 feet or greater in-depth category. In those cases that do the OSHA standards on excavations and trenching shall apply.

9.2.3.1 Before Beginning the Job

Underground utilities must be located and marked before excavation begins. Where the excavation is in close proximity to underground utilities, sufficient hand digging must be done in advance of using power equipment. Carefully use a wooden handled shovel for probing or uncovering a pipe, cable, or a structure so as not to damage it. All exposed utilities shall be supported to prevent damage from cave-ins, pipe movement, settlement, and washouts.

9.2.3.2 Other Safety Considerations

If markings locating underground lines are obliterated or knocked down, or become faded due to weather, construction, or any other cause, the Field Project Manager will be notified for a re-stake. Excavation operations are not permitted until the site has been re-staked.

Prior to back filling, notify the Field Project Manager if there has been damage to the underground utility (coating, nicks, dents, gouges, cuts, scrapes or scratches) so proper repair can be made.

Employees are not allowed in the excavation while heavy equipment is digging.

9.2.4 Noise

Heavy equipment, power tools, and other construction equipment and activities may produce noise levels above acceptable standards. All personnel shall wear hearing-protective devices with a minimum noise reduction rating (NRR) of at least 25 (either ear plugs or muffs) if they are within 25 feet of such operating equipment or when noise levels interfere with normal speech. Hand signals will be established by on-site personnel as appropriate to facilitate communications while involved in high-noise activities.

9.2.5 Weather

Adverse weather conditions will be important considerations when planning and conducting site operations. Hot and cold weather may be encountered as well as thunderstorms and lightning. A break trailer or field office equipped with air conditioning and heating will be part of the site setup.

Buffalo, New York Weather Averages (Degrees Fahrenheit)				
Date	**Average Low**	**Average High**	**Average Precipitation**	**Average Snow**
January	21°	32°	0.8”	4.7”
February	21°	33°	0.7”	5.1”
March	28°	42°	1.2”	4.4”
April	39°	55°	2.0”	0.9”
May	50°	66°	2.4”	0”
June	59°	75°	2.6”	0”
July	64°	79°	2.6”	0”
August	63°	78°	2.5”	0”
September	56°	71°	2.9”	0”
October	45°	59°	2.7”	0”
November	36°	48°	2.1”	1.3”
December	27°	37°	1.4”	4.1”

9.2.5.1 Heat Stress Prevention

The project will use the following plan to mitigate heat stress based on the Heat Index which will be measured with the OSHA Heat App. Construction site managers will be accountable for Heat Stress Prevention and on how to implement the following program.

Heat Index	Risk Level	Protective Measures
Less than 70° F to 91° F (21° C to 33° C)	Lower (Caution)	**No Limits on Self-Paced Work** Employees must do the following: • Drink water throughout the day. Do not wait until you are thirsty. Supervisors must do the following: • Monitor the heat index regularly. • Observe employees who are wearing heavy, non-breathable coveralls or chemical resistant suits and ensure employees do not show signs of heat-related illness. • Acclimate new and returning employees who perform strenuous work.
91° F to 103° F (33° C to 39° C)	Moderate	**Conditions May Limit Work Activities** Employees must do the following: • Drink approximately 4 cups of water every hour.

		• Rest for 5 minutes every hour. • Observe coworkers for signs of heat-related illness. Supervisors must do the following: • Ensure that shaded or air-conditioned areas for breaks are close to the work area. • Acclimate new and returning employees. Those who are not acclimated fall under 'High' risk protocols until acclimated. • Ensure that employees are drinking enough water, resting adequately, and not experiencing heat-related symptoms.
103°F-115°F (39°C-46°C)	High	**Conditions Will Limit Work Activities** Employees must do the following: • Drink, at minimum, 4 but no more than 6 cups of water per hour. If possible, water should be between 50° F and 60° F (10° C and 16° C). • Rest for 10 minutes (suggest removing impermeable clothing) every hour. Supervisors must do the following: • Set up a buddy system so that no one is working alone. • Ensure employees are acclimated to the weather conditions. Those who are not acclimated fall under 'Very High to Extreme' risk protocols until acclimated. • Closely supervise new employees for the first 7 days until fully acclimated. • Observe employees several times per hour for signs of heat-related illness. • Use non-invasive thermometers on all employees during rest periods and breaks to ensure heat-related illnesses are avoided.
Greater than 115° F (46° C)	Very High to Extreme	**Work Limited to Essential Functions** Employees must do the following: • Drink, at minimum, 4 but no more than 6 cups of water per hour. If possible, water should be between 50° F and 60° F (10° C and 16° C). Supervisors must do the following: • Provide employees with personal cooling measures. • Schedule 50 percent work/rest ratio with no working duration greater than 20 minutes. • Set up shade canopies over work areas that are in direct sunshine or, if possible, move jobs to naturally shaded areas. • Ensure that the buddy system is in place. Working alone is prohibited. • Never leave employees unattended, constantly observe for signs of heat-related illness. • Use non-invasive thermometers on all employees during rest periods and breaks to ensure heat-related illnesses are avoided.

Water must be provided. Cool individual bottled drinking water will be supplied in coolers throughout the site being accessible to all employees to encourage frequent drinking. Electrolyte supplements can also be made available upon request. When temperatures are expected to exceed 85 deg. Fahrenheit employees will be reminded during the morning safety meeting to take needed breaks and to drink plenty of water as well as the symptoms and treatment of heat illness.

Access to shade. Shade tents or equivalent will be placed throughout the site being accessible to all employees. In situations where it is not safe to have tents erected (ex. Due to high winds, energized substations) employees will rest in the break room/tool trailer.

9.2.5.2 Cold Weather Awareness

1. When working in cold environments, dress to stay warm and dry. Use rain gear, layered or insulated clothing as appropriate.
2. Observe co-workers for symptoms of frostbite and hypothermia. When necessary, use warming shelters or vehicle cabs for temporary relief. Seek medical attention when appropriate.
3. Walk carefully on snowy and icy surfaces.
4. Soaking wet clothing contributes to hypothermia and should be removed as soon as possible.
5. Be aware that alcohol consumption at night can cause dehydration the next morning.
6. Coffee, Tea, and Energy Drinks cause dehydration. Drink even more water than normal.

Work/Warm-up Schedule for a 4-Hour Shift

Air Temp-Sunny Sky	No Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
°F (Approximate)	Max Work Period	# of Breaks	Max Work Period	# of Breaks	Max Work Period	# of Breaks	Max Work Period	# of Breaks	Max Work Period	# of Breaks
-15 to -19	(Normal Breaks) 1		(Normal Breaks) 1		75 min	2	55 min	3	40 min	4
-20 to -24	(Normal Breaks) 1		75 min	2	55 min	3	40 min	4	30 min	5
-25 to -29	75 min	2	55 min	3	40 min	4	30 min	5	Non-Emergency work should cease	
-30 to -34	55 min	3	40 min	4	30 min	5	Non-Emergency work should cease			
-35 to -39	40 min	4	30 min	5	Non-Emergency work should cease					
-40 to -44	30 min	5	Non-Emergency work should cease							
-45 & below	Non-Emergency work should cease									

The above schedule applies to any 4-hour work period with moderate to heavy work activity; with warm-up periods of ten (10) minutes in a warm location and with an extended break (e.g., lunch) at the end of the 4-hour work period in a warm location.

9.2.5.3 Weather Emergency Notification

Keep an eye on the weather! It may seem like simple advice, but keeping an eye on the weather is one of the first steps in keeping workers and the job-site safe. That way, workers will be aware of impending weather and can prepare accordingly. Be sure to go over the plan at the beginning of the work day if severe weather is possible.

Severe thunderstorms, tornados, heavy snow, ice storms and flooding are weather events that can directly impact the safety of job-site personnel. Many of these events are preceded by two levels of advance public notification:

Watch: A forecast issued well in advance of a severe weather event to alert the public of the possibility of a particular hazard, such as tornadoes, severe thunderstorms, flash and river floods, winter storms, heavy snows. The purpose of the watch is to make you aware of what could happen, and allow you to plan and prepare for the possible weather event. This is the time to:

- Turn on NOAA radio,
- verify location of fellow workers and subcontractors,
- watch the sky,
- make sure you have ready access to safe shelter,
- contact your Project Manager so they are aware of the weather conditions.

Warning: A forecast issued when severe weather has developed, is already occurring and reported, or is detected on radar. Warnings state a particular hazard or imminent danger, such as tornadoes, severe thunderstorms, flash and river floods, winter storms, heavy snows, etc. A severe weather warning means the mentioned weather situation is imminent or taking place at that moment in the warning area.

9.2.5.4 Lightning Alert System

Lightning may pose a threat well before strong winds/rain affect the job-site. Workers out in open fields, or on roof tops, need to be especially cautious. Inovateus Solar supervisor will monitor weather on a daily basis, either by visual, weather services and/or weather App.

- Thunderstorms that reach a 30-mile distance:
  - Inovateus Solar will communicate a **"WATCH"** is in effect for all workers
- Thunderstorms that reach a 20-mile distance:
  - Inovateus Solar will communicate a **"WARNING"** is in effect for all workers and to be prepared to take shelter. All outdoor high work (cranes, aerial lifts, etc.) will be discontinued
- Thunderstorms that reach 10-miles distance:
  - Inovateus Solar will communicate **"TAKE IMMEDIATE SHELTER"** to all workers

Inovateus Solar will announce an **"ALL CLEAR"** when the 10-mile radius has been verified and free from the last audible thunder or lightning for 30 minutes. Communication devices that will be used are verbal, cell phone or radios.

NOTE: The possibility exists that not all workers will be aware of the alert, especially those working within construction equipment. Workers should communicate with one another and make sure all workers are aware of the lightning alert.

9.2.5.5 Lightning Safety

Workers account for about one-third of the total number of people struck by lightning; roofers, construction workers, road crews, pipe fitters and farm workers are especially at high risk. Lightning typically strikes tall objects, including people standing on open ground or a roof.

Lightning Safety Policy for Outdoor Work Sites:

- Monitor weather conditions in the early morning hours for reports of impending severe weather in your area. If warranted, continue to monitor weather conditions throughout the day.
- All workers should understand what lightning safety plans are in place, which includes what shelters are available to them at the job-site and the Lightning Alert System above.
- It's easy to determine when to take shelter. If you hear thunder, the associated lightning is within 8 miles. Suspend activities, allowing sufficient time to get to shelter. A good lightning safety motto is: "If you can see it (lightning), flee it; if you can hear it (thunder), clear it."
- If you feel your hair standing on end, and/or hear "crackling noises," you are in the lightning electrical field. If caught outside during a lightning storm, immediately remove all metal objects (including hats), place your feet together, duck your head, and crouch down low in baseball catcher's stance with hands covering your ears.
- Wait a minimum of 30 minutes from the last observed lightning or thunder before resuming normal work activities. Be extra cautious during this phase, as the storm may not be over.
- If someone has been struck by lightning, get emergency help promptly and apply first aid. It is a myth that lightning victims carry a charge after the strike—they are safe to handle and may need first aid immediately.

Safe Shelter Considerations:
Ordinary wood buildings provided for worker lunch breaks, or shelter from rain or sun, are not safe from lightning. Similarly, small post-supported structures, such as bus stops or picnic shelters, are not safe either and cannot be made safe for people.

Fully enclosed metal vehicles are safe shelters, as well as other all-metal, mobile equipment. This includes airplanes, buses, vans and construction equipment with enclosed metal cabs, provided the "outer metal shield" is fully intact. All windows must be rolled up and people inside should avoid touching all objects that penetrate from inside to outside (e.g., radio dials, metal door handles, two-way radio microphones, etc.).

Unsafe vehicles include those made of fiberglass and other plastics, plus small riding machinery or vehicles without enclosed canopies, such as motorcycles, farm tractors, golf carts and ATVs.

SAFE:

- Fully enclosed metal vehicles with windows up
- Fully enclosed buildings with plumbing and/or electrical service
- Low ground, ditches, or clumps of bushes

- Trees of uniform height, such as a forest

UNSAFE:

- Outdoor areas with metal objects such as power poles, fences, high-mast light poles, metal bleachers, electrical equipment, mowing and road machinery
- Solitary trees
- Bodies of water, open fields, high ground and caves

9.2.6 Slip, Trip, and Fall Hazards

Slip, trip, and fall hazards may exist throughout the site. Protection from slip, trip and fall hazards will be provided through standard safety procedures including good housekeeping. Properly locating equipment and tools, removing debris and trash, and taking general precautions during site operations will be standard operating procedures. Whenever possible, trip and fall hazards will be eliminated or clearly identified with yellow “caution” tape. Impalement hazards to associates will be neutralized as soon as they are identified. Subcontractors will be responsible for the use of safety harnesses, lifelines, lanyards, safety nets, etc., for safeguarding their employees when performing elevated work in compliance with 29 CFR 1926.500 Subpart M.

9.2.7 Fire and Flammable Liquids

Fire extinguishers shall be provided in fuel areas, storage areas, portable buildings, and equipment. All extinguishers will be inspected, serviced, and maintained. No burning of materials will take place at the project site. All flammable liquids and combustibles will be marked and stored in a manner to conform to NFPA and OSHA 29 CFR 1926.151 & 152 requirements. A hot work permit will be used when welding or cutting work is performed.

9.2.8 Debris Removal

Debris removal will be accomplished with equipment and manual labor. Proper PPE, daily work requirements, manual lifting techniques, and good housekeeping must be discussed and maintained. Debris removal will be an ongoing process that has many slip, trip, and fall hazards that must be addressed. Nails, metal panels, sharp edges, heavy loads, and biological hazards are some of the hazards associated with this job. Daily work activities will be discussed each day.

Housekeeping

Housekeeping is the foundation of a good safety program. Keep your work area clean. A clean work area is a safe area. Dispose of or clean up spilled material, scrap, and other tripping hazards out of walkways, stairs, and away from emergency equipment. Cover all exposed re-bar ends that pose an impalement hazard with appropriate protection, such as re-bar caps, lumber in combination with yellow caps, and wooden troughs.

9.2.9 Traffic Management

A more detailed and comprehensive job site traffic management plan is under separate cover and shall be followed by all subcontractors, suppliers, delivery vehicles and job site visitors.

9.2.10 Hand Injuries

ANSI A3 (CUT3) rated gloves will be required for all project activities.

Hand injuries may be encountered in various ways at this job site:

- Absorption of harmful substances
- Severe cuts or lacerations
- Severe abrasions
- Punctures
- Pinch points
- Crushing
- Thermal burns

Hand hazards and protection specific to the job task will be discussed in the daily tailgate meetings prior to beginning every job task in order to prevent hand injuries.

Associates will know and understand the hazards that exist while performing their job task. Hazards will be mitigated by:

- Applying the correct level of hand protection as described in Section 7 – Personal Protective Equipment.
- Reviewing the hasp and signing the Acknowledgement Form acknowledging they understand the scope of work and hazards involved.
- Inspecting hand protection PPE prior to use and are responsible for immediate replacement of damaged or worn PPE.
- Following the "Rules for Safe Use of Hand Tools."
- Associates verbally communicate with each other what is going on and what your co-worker(s) will be doing next.
- Associates will stop all moving parts before placing hands on them, let the energy out of moving parts, and make sure hands are away from potentially moving parts before adding energy. Follow Lock-out/Tag-out Procedure.
- Use Stop Work Authority should any unsafe condition exist.
- Fixed open blade knives are prohibited to be used as a tool. Exceptions can be made, but must be approved by the Field Project Manager.

9.2.11 Ladders

According to OSHA statistics, falls from portable ladders are a major cause of serious injury. Ladders shall be inspected before and after each use for any cracks or defects. If defective, a ladder shall be repaired immediately, or tagged and removed from service. Proper precautions shall be taken prior to the use of a ladder.

- Do not erect ladders on boxes, carts, tables, or other unstable surfaces.
- Clean muddy or slippery footwear before mounting a ladder, whenever possible.
- Employees shall face the ladder when going up or down or performing work activities.
- Employees shall maintain a three-point contact on the ladder at all times. Small articles should be carried in pockets or in a belt. Larger articles shall be lifted to or lowered from elevated locations by hand line or a hoist.
- Employees shall use the proper type of ladder best suited for the job (step, extension, or fiberglass).
- Only non-metallic ladders shall be used in or around electrical cubicles, switchgear, or when working on any electrical installation and should be carried horizontally below shoulder level.

- No aluminum ladders shall be utilized.
- Ladders shall not be loaded beyond the maximum intended load for which they were built, nor beyond their manufacturer's rated capacity.

Step Ladders

- Employees shall open step ladders fully and check the stability of the ladder, ensuring that all four legs are on firm, level ground.
- Employee shall use a step ladder perpendicular to the work.
- Employee shall use a step ladder that is about three feet shorter than the highest point needed to reach.
- Employees shall not stand any higher than the second step from the top.
- A step ladder shall not be used to brace or support a work platform or plank.

Extension Ladders

- The base of the ladder shall be ¼ of its working length form the vertical to obtain a safe working angle (one foot out for every four feet in height).
- Ladders shall be extended at least three feet above the upper working surface.
- Set the ladder on a secure footing. Ensure that the ladder has slip-resistant feet, secure blocking, or have someone hold the base of the ladder.
- Grasp the rungs, not the side rails, when climbing the ladder.
- Erect the ladder so that the upper section rests on the bottom section maintaining the minimum overlap of sections as shown on the ladder label.
- Ensure that the locking ladder hooks are secured before climbing.
- Tie off the ladder at the top to prevent it from slipping or blowing over.
- Stand no higher than the fourth rung from the top.

Stairways/Ramps

- All rises over 19” require a ladder, stairway, or ramp.
- Proper railings must be installed.
- Jobsite trailers require stairways and platforms for swing doors. Guardrails shall be provided around the platforms.

9.2.12 Hazardous Energy Sources (Lock-out/Tag-out)

Inovateus personnel will not install or uninstall electrical power connections to any building or facility. Only qualified electricians will connect, disconnect, re-wire or maintain electrical power service.

Site specific lock-out tag-out requirements will be implemented to prevent incidents and injury associated with inspection, maintenance, and/or setup of equipment, machines, or processes where unintentional startup, or release of stored energy would be expected to cause harm to persons involved in such work, bystanders or property.

Lock-out/Tag-out

The purpose of a lock-out/tag-out procedure is to prevent the unexpected or unwanted activation of equipment or processes during scheduled maintenance work or working in proximity to an active

system. A good example of when a lock-out/tag-out procedure needs to be in place is when an employee is making wiring repairs on an electrical outlet. The procedure would enable us to physically lock down the electrical system with a "master lock" so another employee could not walk by and turn the power on. Some general requirements are as follows:

- All hazardous energy sources with electrical, chemical, thermal, pneumatic, hydraulic, and mechanical potential must be locked or secured prior to performing activities.
- Individual employee locks must be used to secure energy-isolating devices.
- Only the individual employee applying the lock may remove the lock.
- Energy control must be verified before working on equipment or processes. An attempt to start the equipment or the use of measurement instruments are examples of verification.
- All lock-out devices are to be removed promptly after work has been completed.

9.2.13 Hot Work

Although hot work is not anticipated for this project, it may be necessary for maintenance or equipment repair. All hot work will be conducted under the subcontractor's Hot Work Program and will require issuance of a Hot Work Permit prior to initiation of hot work.

9.2.14 Hauling Trailers

Inovateus personnel are not permitted to haul trailers. This activity will be the responsibility of job-site subcontractors. Hauling with trailers is limited to shipment, delivery and relocation of construction equipment and shall comply with the subcontractor's Trailer Towing SOP.

9.2.15 Confined Space

A confined space is defined as any location that has limited openings for entry and egress, is not intended for continuous employee occupancy, and is so enclosed that natural ventilation may not reduce air contaminants to levels below the threshold limit value (TLV). Examples of confined spaces include: manholes, stacks, pipes, storage tanks, trailers, tank cars, pits, sumps, hoppers, and bins. Entry into confined spaces without proper precautions could result in injury, impairment, or death.

All activities involving a Confined Space shall comply with all applicable OSHA standards.

- Subcontractors are responsible to train employees who are involved with confined space entry. No one may enter a confined space area until properly trained.
- Prior to the start of such an entry, each subcontractor involved in the work shall develop a Confined Space Entry Procedure.
- Subcontractors are required to identify all confined spaces on their project with a sign identifying the area as a confined space.
- Subcontractors are responsible for providing and using all atmospheric testing devices.

NOTE: Confined space entry is not anticipated for this project.

9.2.16 Unique Site-Specific Hazards

Acknowledgements - *See table of emergency contacts for telephone numbers.*

Responsibility	Name	Signature	Date
Inovateus Director of Project Management	Todd Collins	DocuSigned by: Todd Collins 6BD858F1A601419...	1/23/2024 | 11:19 A
Inovateus Construction Manager	Joaquin Corona	DocuSigned by: [signature] 58EFFE42E36542F...	1/15/2024 | 9:00 AM
Inovateus Project Manager	Megan Drean	DocuSigned by: Megan Drean DC48D49B8E6444A...	1/12/2024 | 1:50 P
Civil Subcontractor (Milestone Construction)	Matthew Beres	DocuSigned by: Matthew Beres B810F65988ED447...	1/15/2024 | 3:02 PM
Electrical Subcontractor (Schuler-Haas)	Devyn Smith	DocuSigned by: Devyn Smith 6C6A8462C0F4489...	1/15/2024 | 3:16 PM
Mechanical Subcontractor (LBFNY)	Bryan Lampson	DocuSigned by: Bryan Lampson 6DBFB77E41C5474...	1/15/2024 | 3:43 PM
Fencing Subcontractor	Christine Watt	DocuSigned by: Christine Watt C18A01424C0E43B...	1/20/2024 | 5:51 PM
GPI Survey	Mark Andrews	DocuSigned by: Mark Andrews 7D5F9C...	1/22/2024 | 1:28

This is a solar construction project involving mechanical and electrical construction. These activities typically don't present unique hazards. Hazards that are unique and outside of these activities will be addressed during the initial site orientation, tailgate safety meetings and identified in the subcontractor's JHA's. Since the construction of the solar array will be performed on the Operable Unit No. 3 (OU-3) and Operable Unit No. 2 East (OU-2E) of the ExxonMobil Former Buffalo Terminal site (NYSDEC Sites #C915201D and #C915201B), it will require extensive planning and monitoring of all construction activities. Inovateus Solar and their subcontractors should reference and review the LaBella Change of Use Letter Work Plan and the Excavation Work Plans (EWPs) for OU-3 and OU-2E contained in the Site Management Plans (SMPs). The site will follow a strict NO SMOKING POLICY for the duration of construction.

This site contains a GSL liner (cap). Maintaining the integrity of this liner is required to protect from previous industrial activities. Per note 6 of drawing T-0.1, **"DO NOT USE STEEL PINS, GRADE STAKES, OR OTHER MARKING DEVICES THAT COULD PUNCTURE THE GSL LINER."** Therefore, routine brownfield inspections will be performed by QA/QC to ensure construction activities do not penetrate the liner.

9.3 Biological Hazards

Personnel will be cautioned not to disturb insects or animals. Personnel with particular allergies to bee or wasp stings will not work in areas where contact is possible unless they notify the CM of the allergy and carry appropriate anti-venom kits as necessary. First aid kits should include remedies for possible encounters, including equipment for poisonous snakebites. Insect repellents will be

available on the site at all times. Personnel with particular allergies to such compounds will be cautioned prior to their application of the chemical makeup.

The following biological hazards may be present at the site. The CM will instruct the field crew of the applicable biological hazards during the site orientation and periodically throughout the project.

9.3.1 Insect Bites and Stings

Insects could be present at this site making the chance of bites possible. Although they can be painful, they rarely cause death. However, some people have a severe allergic reaction to an insect bite or sting that can result in a life-threatening condition. The following is a list of preventive measures:

- Apply insect repellent prior to fieldwork and/or as often as needed throughout the work shift.
- Wear proper protective clothing (work boots, socks, and light-colored pants).
- Field personnel that may have insect allergies should provide this information to the CM prior to commencing work.

Bee, Wasp, Hornet, and Yellow Jacket Stings

- A bee will leave behind a stinger attached to a venom sac. Try to remove it as quickly as possible. One way is to gently scrape it out with a blunt-edged object, such as a credit card.
- Wash the area carefully with soap and water. Do this two to three times a day until the skin is healed.
- Apply a cold pack, an ice pack wrapped in a cloth, or a cold, wet washcloth for a few minutes.
- Give acetaminophen for pain.
- For pain and itching, give an over-the-counter oral antihistamine. You could also apply a corticosteroid cream or calamine lotion to the sting area.
- A sting anywhere in the mouth warrants immediate medical attention. That is because stings in the mucous membranes of the mouth can quickly cause severe swelling that may block airways. You should seek medical care if you note a large skin rash, a large area of swelling around the sting site, or if swelling or pain persists for more than 72 hours. You should seek immediate medical care if you notice any of the following signs, which may indicate a serious or even potentially life-threatening allergic reaction:
    - wheezing or difficulty breathing
    - tightness in throat or chest
    - swelling of the lips
    - dizziness or fainting
    - nausea or vomiting

Spider Bites

Most spiders found in the United States are harmless, with the exception of the black widow and the brown recluse (or violin) spider. Both of these are found in warm climates.

- Wash the area carefully with soap and water. Do this two to three times a day until skin is healed.
- Apply cool compresses.
- Give acetaminophen for pain.
- To protect against infection, apply an antibiotic ointment and keep hands washed.
- If you have any reason to suspect a bite from a black widow or brown recluse spider, apply

ice to the bite site and head for the emergency room. Symptoms include:

- a deep blue or purple area around the bite, surrounded by a whitish ring and a large outer red ring
- body rash
- muscle spasms, tightness, and stiffness
- abdominal pain
- headache or fever
- general feeling of sickness
- lack of appetite
- joint pain
- nausea or vomiting

Tick Bites

Check for ticks carefully after you have been in or around a wooded area. Common types of ticks include dog ticks and deer ticks (deer ticks may be carriers of Lyme disease). If you find a tick:

- Call a physician. The doctor may want you to save the tick after removal (you can put it in a jar of alcohol to kill it).
- Use tweezers to grasp the tick firmly at its head or mouth, next to the skin.
- Pull firmly and steadily on the tick until it lets go, then swab the bite site with alcohol.
- **Don't** use petroleum jelly or a lit match to kill and remove a tick.

9.3.2 Plants

The potential for contact with poisonous plants exists when performing fieldwork at the site. Poison ivy, sumac, and oak may be present on site. Poison ivy can be found as vines on tree trunks or as upright bushes (poison oak is another name for the bush form of poison ivy). Poison ivy consists of three leaflets with notched edges. Two leaflets form a pair on opposite sides of the stalk, and the third leaflet stands by itself at the tip. Poison ivy is red in the early spring and turns shiny green later in the spring.

Poison sumac can be present in the form of flat-topped shrub or tree. It has fern-like leaves that are velvety dark green on top and pale underneath. The branches of immature trees have a velvety “down.” Poison sumac is white and has “hairy” berry clusters.

Contact with poison ivy, sumac or oak may lead to a skin rash, characterized by reddened, itchy, blistering skin that needs first aid treatment. If you believe you have contacted one of these plants, immediately wash skin thoroughly with soap and water, taking care not to touch your face or other body parts.

The following is a list of preventive measures:

- Know what the plants look like and avoid them.
- Use OTC poison ivy blocker.
- Wear appropriate protective clothing (long sleeves, pants, gloves, etc.)

If you are exposed, according to the FDA, you should quickly (within 10 minutes):

- First, cleanse exposed areas with rubbing alcohol.
- Next, wash the exposed areas with water only (no soap yet, since soap can move the urushiol, which is the oil from the poison ivy that triggers the rash, around your body and

actually make the reaction worse).
- Now, take a shower with soap and warm water.
- Lastly, put gloves on and wipe everything you had with you, including shoes, tools, and your clothes, with rubbing alcohol and water.

9.3.3 Snake Bites

There could be the potential for contact with snakes when performing field work. If bitten by a snake, remain calm, keep the affected area below the level of the heart and walk, do not run, to the nearest aid station for assistance. The CM will immediately transport the victim to the closest medical facility for treatment or send for appropriate medical assistance, whichever is faster.

The following precautions should be used when working in areas with snakes:

- Wear appropriate protective equipment (work boots).
- Be alert and aware of surroundings.
- Avoid walking in wooded areas and through bushes, tall grass, or brush as much as possible.

The following is a list of preventive measures:

- Be familiar with your surroundings.
- If you see a snake, back away slowly and do not touch it.
- Leave snakes alone. Many people are bitten because they try to kill a snake or get a closer look at it.
- Stay out of tall grass unless you wear thick leather boots or chaps.
- Keep hands and feet out of areas you cannot see.
- Be cautious and alert when working around brush and debris.

The American Red Cross recommends the following first aid treatment:

- Wash the bite with soap and water.
- Immobilize the bitten area and keep it lower than the heart.
- Get medical help.

9.3.4 Wildlife

Coyotes and other wildlife present a potential hazard to workers. Avoid contact with wildlife and never feed the animals.

9.4 Hazard Analysis and Mitigations by Tasks

This section assesses the risks of each major project task, as listed in Table 10.4A. The corresponding tables have been prepared to develop awareness of chemical and physical hazards specific to these major project tasks. Information in this section should be discussed prior to the start of each new task to be performed and during daily tailgate safety meetings.

It is the responsibility of each associate to assess their task, analyze potential risk reduction procedures and complete a JHA before performing their job task. Sources and hazards will be addressed for job tasks with reference made to applicable control measures in the following tables and site-specific plans. Tables 10.4B to 10.4F should be posted at the field office.

Table 10.4A

Overview of Major Project Job Tasks			
Table	**Job Task**	**Hazard Rating**	**PPE Level**
10.4B	Mobilization and Site Preparation, including Utility Locates	Low	D
10.4C	Construction of Solar Array	Low to Med	D
10.4D	Construction of Overhead Lines	Low to Med	D
10.4E	Restoration	Low	D
10.4F	Maintenance	Low	D

Table 10.4B

Mobilization and Site Preparation		
PPE: Level D		**Hazard Rating:** Low
Hazard	**Sources**	**Control Measures**
Manual Labor	Materials Equipment	Stretching and proper lifting techniques and possible use of mechanical equipment or hand trucks. Working in minimum groups of two.
Slip/Trip/Falls	Various Sources	Housekeeping rules shall be established and followed. Pre-existing slip, trip, and fall hazards will be marked, barricaded, or eliminated. Areas will be discussed in safety orientation.
Electrocution	Electrical utilities	Only qualified electrician will be allowed to hook-up circuits. Extension cords will be inspected. GFCI will be used. Verification that electrical services have been disconnected from the exclusion zone or properly marked and identified.
Heat Stress	Summer Temperatures	Shade and drinking water will be readily available at field locations.
Lightning	Thunderstorms	Discuss daily weather forecast in tailgate safety meetings. Follow 30/30 rule for lightning safety.
Incidental Injury	Mis-communications; General work activities	Site orientation and training. Positive attitude and behavior will show active participation of self-safety analysis by all associates of tasks to be performed.
Biological Hazards	Insects, Snakes, Ticks, Plants	See Section 5.3.
Vehicle Accident	Traffic	Develop/establish authorized parking area at field office. Always Park for first move forward. When parking along active roadway use 4-way flashers and pull off roadway as far as possible.

Hand Injuries	Pinch points and hand traps	Utilize proper glove for the task. Think before placing hands into hazard zone. Utilize chemical resistant gloves in wet locations.

Table 10.4C

Construction of Solar Array		
PPE: Level D	**Hazard Rating:** Low	
Hazard	**Sources**	**Control Measures**
Hazardous Atmosphere	Nuisance Dust	Dust suppression. Application of water to prevent dust.
Slips/Trips/Falls	Various Locations	Identifiable areas will be either eliminated or marked. Discuss in safety meetings.
Electrocution	Electrical utilities	Only qualified electrician will be allowed to hook-up circuits. Extension cords will be inspected. GFCI will be used. Verification that electrical services have been disconnected from the exclusion zone or properly marked and identified.
Heat Stress	Summer Temperatures	See Section 5.2.5. Shade and drinking water will be readily available at field locations.
Biological Hazards	Insects Snakes	See Section 5.3.
Lightning	Thunderstorms	Discuss daily weather forecast in tailgate safety meetings. Follow 30/30 rule for lightning safety.
Noise	Machinery	Hearing protection with a NRR of at least 25 will be worn.
Physical Labor	Moving heavy objects and routine tasks	Use moving equipment to construct SWPPP. A minimum of two people will be used to move heavy items on uneven surfaces.
Heavy Equipment Injury	Machinery	Qualified operators, daily inspection of equipment. Site orientation will include discussion of swing radius hazards and blind spots. Utilize 3-point mount and dismount procedures at all times.
Vehicle Accident	Traffic	Develop/establish authorized parking area at Repository. Always Park for first move forward. When parking along active roadway use 4-way flashers and pull off roadway as far as possible.
Hand Injuries	Pinch points and hand traps	Utilize proper glove for the task. Think before placing hands into hazard zone. Utilize chemical resistant gloves in wet locations.

Table 10.4D

Construction of Overhead Lines		
PPE: Level D		**Hazard Rating:** Low
Hazard	**Sources**	**Control Measures**
Hazardous Atmosphere	Nuisance Dust	Dust suppression. Application of water to prevent dust.
Slips/Trips/Falls	Various Locations	Identifiable areas will be either eliminated or marked. Discuss in safety meetings.
Electrocution	Electrical utilities	Only qualified electrician will be allowed to hook-up circuits. Extension cords will be inspected. GFCI will be used. Verification that electrical services have been disconnected from the exclusion zone or properly marked and identified.
Heat Stress	Summer Temperatures	See Section 5.2.5. Shade and drinking water will be readily available at field locations.
Biological Hazards	Insects Snakes	See Section 5.3.
Lightning	Thunderstorms	Discuss daily weather forecast in tailgate safety meetings. Follow 30/30 rule for lightning safety.
Noise	Machinery	Hearing protection with a NRR of at least 25 will be worn.
Physical Labor	Moving heavy objects and routine tasks	Use moving equipment to erect poles and lines. A minimum of two people will be used to move heavy items on uneven surfaces.
Heavy Equipment Injury	Machinery	Qualified operators, daily inspection of equipment. Site orientation will include discussion of swing radius hazards and blind spots. Utilize 3-point mount and dismount procedures at all times.
Vehicle Accident	Traffic	Develop/establish authorized parking area. Always Park for first move forward. When parking along active roadway use 4-way flashers and pull off roadway as far as possible.
Hand Injuries	Pinch points and hand traps	Utilize proper glove for the task. Think before placing hands into hazard zone. Utilize chemical resistant gloves in wet locations.

Table 10.4E

Restoration		
PPE: Level D		**Hazard Rating:** Low
Hazard	**Sources**	**Control Measures**
Hazardous Atmosphere	Nuisance Dust	Dust suppression. Application of water to prevent dust.
Slips/Trips/Falls	Various Locations	Identifiable areas will be either eliminated or marked. Discuss in safety meetings.
Heat Stress	Summer Temperatures	See Section 5.2.5. Shade and drinking water will be readily available at field locations.
Biological Hazards	Insects Snakes	See Section 5.3.
Lightning	Thunderstorms	Discuss daily weather forecast in tailgate safety meetings. Follow 30/30 rule for lightning safety.
Noise	Machinery	Hearing protection with a NRR of at least 25 will be worn.
Physical Labor	Moving heavy objects and routine tasks	Use moving equipment for restoration tasks. A minimum of two people will be used to move heavy items on uneven surfaces.
Heavy Equipment Injury	Machinery	Qualified operators, daily inspection of equipment. Site orientation will include discussion of swing radius hazards and blind spots. Utilize 3-point mount and dismount procedures at all times.
Vehicle Accident	Traffic	Always Park for first move forward. When parking along active roadway use 4-way flashers and pull off roadway as far as possible.
Hand Injuries	Pinch points and hand traps	Utilize proper glove for the task. Think before placing hands into hazard zone. Utilize chemical resistant gloves in wet locations.

Table 10.4F

Maintenance		
PPE: Level D		**Hazard Rating:** Low
Hazard	**Sources**	**Control Measures**
Hazardous Atmosphere	Nuisance Dust	Dust suppression. Application of water to prevent dust.

Misuse Of Tools	Hand Tools	Tools will be inspected and maintained in safe working conditions. All tools shall be secured when not in use and during transport.
Biological Hazards	Insects, Snakes, Ticks, Plants	See Section 5.3.
Back Strain	Lifting heavy objects	Use proper lifting technique.
Noise	Machinery	Hearing protection with a NRR of at least 25 will be worn.
Manual Labor	Materials Equipment	Stretching and proper lifting techniques and possible use of mechanical equipment or hand trucks. Working in minimum groups of two.
Heat Stress	Summer Temperatures	See Section 5.2.5. Shade and drinking water will be readily available at field locations.
Lightning	Thunderstorms	Discuss daily weather forecast in tailgate safety meetings. Follow 30/30 rule for lightning safety.
Incidental Injury	Mis-communications; General work activities	Site orientation and training. Positive attitude and behavior will show active participation of self-safety analysis by all associates of tasks to be performed.
Uneven terrain	Slope/grade of excavated hillside	Operators must know and work within limitations of equipment.
Hand Injuries	Pinch points and hand traps	Utilize proper glove for the task. Think before placing hands into hazard zone.
Vehicle Accident	Traffic	Always Park for first move forward. When parking along active roadway use 4-way flashers and pull off roadway as far as possible. Use flagger/spotter when pulling out into traffic.

9.4.1 Job Hazard Analysis (JHA)

Prior to the start of work activities, subcontractors shall complete a detailed Job Hazard Analysis of tasks to be performed for each construction work activity that is potentially hazardous in nature, such as work from heights, scaffold use, trenching operations, steel erection, electrical, crane operations. The JHA shall be a comprehensive evaluation of the work activity broken down into basic job steps, hazards identified for each step and contain hazard control measures for each hazard identified.

Identifying Workplace Hazards

A job hazard analysis is an exercise in detective work. Our goal is to discover the following:

- What can go wrong?
- What are the consequences?
- How could it arise?
- What are other contributing factors?
- How likely is it that the hazard will occur?

JHA's shall be ongoing and shall be updated as necessary and completed for new tasks prior to the start of work activity. JHA's must be reviewed with applicable employees prior to the start of work at each occurrence and when changes are made. All approved JHA's will be place in a binder and kept at the job-site.

10 Incident/Accident/Near-Miss Reporting

Any incident resulting in personal injury, close calls, or property damage shall be reported to the Inovateus Field Project Manager and/or the Job-Site Project Safety Manager immediately. The Subcontractor Foreman shall then submit a written incident report involving injuries within 24 hours. OSHA required incidents must be reported within 8 hours and shared with the client within 24 hours. Incidents may involve but are not limited to:

- Lost time injuries
- Medical aid injuries
- First aid injuries
- Vehicle accidents
- Any property damages
- Fires or explosions
- Close call incidents
- Lifting device failures
- Near Misses

10.1 Incident Investigation

The investigation process should begin after arranging for first aid or medical treatment for the injured person(s). In getting started, remind everyone involved—especially workers— the investigation is to learn and prevent, not find fault. Steps of the investigation process include:

1. Call or gather the necessary person(s) to conduct the investigation and obtain the investigation kit.
2. Secure the area where the injury occurred and preserve the work area as it is.
3. Identify and gather witnesses to the injury event.
4. Interview the involved worker.
5. Interview all witnesses.
6. Document the scene of the injury through photos or videos.
7. Complete the investigation report, including determination of what caused the incident and what corrective actions will prevent recurrences.
8. Use results to improve the injury and illness prevention program to better identify and control hazards before they result in incidents.
9. Ensure follow-up on completion of corrective actions.

To complete an investigation promptly following an incident, have the following items available (Investigation Kit):

- Incident/Investigation Form and Instructions
- Camera/Phone
- PPE
- Pen

10.2 Incident Reporting

All incidents, injuries, and near misses must be reported immediately to the associate's supervisor. Subcontractors will promptly report any incident to the Inovateus FPM. Work will stop until the situation is addressed and work can safely resume. Incident information will be forwarded to the Project Health and Safety Manager and Corporate Health and Safety Director within 24-hours. The client's construction manager will be notified at the earliest opportunity and will be provided with a copy of the incident investigation.

A thorough investigation will commence to determine the facts of the incident, root causes, solutions, and verification and validation of solutions. A completed Loss Investigation/Near Loss Investigation report and supplemental information (first report of injury, witness statements, supervisor statement, police report, damaged equipment report, monitoring reports, etc.) must be provided to Corporate Health and Safety within 5 working days of all incidents. If applicable, a Why Tree Incident Investigation will commence following established protocol and final report submitted to the Health and Safety Director within two weeks of the incident. Inovateus' Post Accident Drug and Alcohol testing procedures will be followed.

10.3 Emergency Notification

The Field Project Manager shall post onsite emergency numbers and directions to the site in each job trailer and gang box.

In emergency medical situations, if the injured employee cannot be transferred by a company vehicle to the posted medical facility, the posted emergency number will be called to dispatch the emergency medical responders to the site. The Subcontractor Foreman will assign an employee to go meet the ambulance at the site entrance and direct them to the injured employee.

11 Emergency Action Plan

Under separate cover, the Project Safety Manager, with assistance from the Field Project Manager, will manage the Emergency Action Plan for Inovateus Solar. The Project Safety Manager will also maintain all training records pertaining to this plan. The Project Safety Manager is responsible for scheduling routine tests of the emergency notification system with the appropriate authorities.

The Project Safety Manager will also coordinate with local public resources, such as fire department and emergency medical personnel, to ensure that they are prepared to respond as detailed in the plan. This includes allowing emergency responders to perform a walkthrough of the facility to familiarize themselves with the layout of the job site and hazards they might encounter when responding to an emergency. Emergency-responder input will be incorporated into this Emergency Action Plan.

12 Electrical Safety

Electrical work is inherently dangerous due to the potentially lethal hazards of electrical shock and arc flash. This section identifies electrical hazards, establishes means of assessing the associated risks, and

identifies methods of hazard mitigation. Only Qualified Electrical Workers (QEW) shall perform the electrical tasks associated with the solar array installation.

All electrical tasks will be evaluated prior to work being performed and the degree of training shall be determined by the risk to the employee for the hazards involved, and shall include safety-related work practices. The following are general safety tips:

- All electrical tools and equipment must have a functional ground pin (3-prong) or be of the doubled insulated (2-prong) type.
- All electrical cords shall be plugged into ground fault circuit interrupters (GFCI).
- All extension cords must be of the heavy-duty type. Flat house-type cords are not permitted.
- Tools and extension cord with the ground prong missing shall not be used.
- Energized wiring in junction boxes, circuit breakers, etc. must be labeled and covered at all times.
- Faceplates must be on receptacles in construction trailers.
- All temporary outlets must be fixed and located in proper outlet boxes.
- Know whether a circuit is energized before beginning work near any electrical wiring.
- Don't make electrical repairs, connections, or installations unless you are qualified to do so.
- All extension cords must be checked before use. Remove damaged cords from service and report them to your supervisor.
- Protect extension cords and wiring from damage from sharp corners, pinching and being run over.
- Do not wear metal or conductive hard hats when working near electrical circuits.
- Know the location of electrical circuits whether it be underground or in a concrete slab before beginning such work as drilling, jack hammering, or excavating to prevent accidental contact.

12.1 Shock and Arc Flash Incidents

Shock - All incidents involving electrical contact (shock) with equipment energized at ≥ 50 volts (AC or DC) shall immediately be reported to the employee's leader and medical attention sought as soon as possible for the injured person(s).

Arc Flash - All incidents involving electrical arc flash are to be reviewed by the job leader. The job leader shall have the answers to the following questions prior to contacting medical.

a. Does the employee show signs of any physical (medical) symptoms of injury [i.e., blurred vision, burns, shock (medical condition), etc.]?
b. When the arc flash occurred, was the employee wearing the appropriate level of ARA and PPE/UV to perform the task inside the arc flash boundary?
c. If outside of the arc flash boundary, what was the proximity of the employee to the arc flash?

Based on the answers to the above questions, Inovateus HR will determine whether the employee will report for medical attention.

12.2 Hazard Risk Assessment

The Hazard Risk Assessment components:

- Identify hazard identification task.
- Identify the group performing task.

- Select the hazard categories/potential outcome for each task identified.
- Rate the severity level and the probability level using a rating scale.
- Identify and select what controls are in place to eliminate or control the hazards identified with each task.

12.2.1 Shock Hazard Risk Assessment

Employee shall be protected from contact with voltages greater than a nominal 50 volts (AC or DC).

Avoid Contact

When working near exposed energized parts of 50 to 300 volts (AC or DC) qualified electrical workers shall avoid contact by using insulating barriers (e.g., rubber insulating gloves, rubber insulating blankets or insulating (PVC) roll blankets, approved insulated tools, etc.).

Conductive Articles

Conductive articles of jewelry and clothing, such as any of the following, shall not be worn inside the minimum/restricted approach distance (e.g., watchbands, bracelets, rings, key chains, necklaces, etc.).

12.2.2 Minimum/Restricted Approach Distances for Qualified Personnel

Nominal Voltage	Distance
50 V - 300 V	Avoid Contact
> 300 V - 750 V	1 ft. 1 in.
> 750 V - 2 kV	1 ft. 6 in.
> 2 kV - 15 kV	2 ft. 3 in.
> 15 kV - 37 kV	3 ft. 0 in
> 37 kV - 87.5 kV	3 ft. 6 in.
> 87.5 kV - 121 kV	4 ft. 8 in.
> 121 kV - 140 kV	5 ft. 5 in.
230 kV	10 ft. 1 in.
345 kV	18 ft. 1 in.

NOTE: Shock protection PPE must cover all body parts that enter the restricted approach distance. There is no shock PPE rated above 36 kV.

NOTE: Shock PPE must be rated for the maximum voltage exposure and tested periodically in accordance with established ASTM standards. No uninsulated tools or body parts may enter the minimum/restricted approach distance.

12.2.3 Limited Approach Distance for Non-Qualified Personnel

Nominal Voltage	Distance
50 V - 750 V	5 ft. 0 in.
> 750 V - 2 kV	10 ft. 0 in.
> 2 kV - 15 kV	10 ft. 0 in.
> 15 kV - 37 kV	10 ft. 0 in.
> 37 kV - 87.5 kV	10 ft. 0 in..
> 87.5 kV - 121 kV	20 ft. 0 in.
> 121 kV - 140 kV	20 ft. 0 in..
230 kV	20 ft. 0 in.
345 kV	20 ft. 0 in.

NOTE: Non-qualified persons must be escorted by a qualified electrical worker to pass the limited approach boundary. Non-qualified persons shall not pass the minimum/restricted approach boundary for energized parts and equipment.

12.2.4 Arc Flash Risk Assessment

Employees shall be protected from exposures greater than 2 cal/cm2. When employees are exposed to the hazard of arc flash, they must wear Arc Related Apparel rated for at least the maximum estimated incident energy of the exposure.

12.3 Grounding for Employee Protection

Guidelines for protective grounding equipment are contained in ASTM F855. Protective grounds shall have an impedance low enough to cause immediate operation of protective devices.

The section applies to the grounding of transmission and distribution lines and equipment for the purpose of protecting employees.

For the employee to work lines or equipment as deenergized, the lines or equipment shall be de-energized and shall be grounded as specified in this section. However, if the employer can demonstrate that installation of a ground is impracticable or that the conditions resulting from the installation of a ground would present greater hazards than working without grounds, the lines and equipment may be treated as deenergized provided all of the following conditions are met:

a. The lines and equipment have been de-energized, and
b. there is no possibility of contact with another energy source, and
c. the hazard of induced voltage is not present.

12.3.1 Equipotential Zone

Equipotential zone means that temporary protective grounds shall be placed at such locations and arranged in such a manner as to prevent each employee from being exposed to hazardous differences in electrical potential.

Protective grounding equipment shall be capable of conducting the maximum fault current that could flow at the point of grounding for the time necessary to clear the fault.

12.3.2 Testing

Before any ground is installed, lines and equipment shall be direct contact tested and found absent of nominal (AC or DC) voltage.

12.3.3 Order of Connection

When a ground is to be attached to a line or to equipment, the ground-end connection shall be attached first, and then the other end shall be attached by means of a live-line tool.

12.3.4 Order of Removal

When a ground is to be removed, the grounding device shall be removed from the line or equipment using a live-line tool before the ground-end connection is removed.

12.3.5 Additional Precautions

When work is performed on a cable at a location remote from the cable terminal, the cable may not be grounded at the cable terminal if there is a possibility of hazardous transfer of potential should a fault occur.

12.3.6 Removal of Grounds for Test

Grounds may be removed temporarily during tests. During the test procedure, the employer shall ensure that each employee uses insulating equipment and is isolated from any hazards involved, and the employer shall institute any additional measures as may be necessary to protect each exposed employee in case the previously grounded lines and equipment become energized.

12.4 Working on or Near Exposed Energized Equipment

12.4.1 Two Person Rule

If working inside the minimum/restricted approach distance for equipment with exposed parts or conductors energized at 600 Volts or more, two persons must be present. Also, when working on or near energized equipment at least as dangerous, such as racking 480-volt breakers with the door open, two persons are required.

12.4.2 Exceptions to Two Person Rule

a. Routine circuit switching where by virtue of distance or enclosure, the person is not exposed to electrical hazards, or
b. work performed with live line tools when the person is outside the minimum approach distance, or

c. emergency repairs to the extent necessary to safeguard the public.

12.5 Fall Protection

Fall protection harnesses used to protect employees from falls while performing work inside the arc flash boundary for conductors or equipment shall be constructed to survive a drop test after receiving arc flash. This requirement applies to both harnesses used in conjunction with aerial work platforms and wood pole climbing.

12.6 Electrical Equipment

All electrical protective equipment requiring inspection and retesting shall use months as the unit of measure for frequency.

12.6.1 Measurement & Test Equipment (M&TE)

- The selection of M&TE shall assure that the requirements of the measurement activity are achieved, and
- selected M&TE shall be utilized within the equipment's ratings to assure the safety of the user, and
- calibrated M&TE shall be used where accuracy of the measurement can impact safety and reliability, and
- M&TE that requires calibration shall be clearly identified with an appropriate label, and
- M&TE shall not be used beyond its calibration due date.

12.6.2 Insulated Tools

Insulated tools must be clearly marked with voltage ratings and meet the requirements of ASTM F1505. Insulated tools are typically rated at 1000 volts or less. Insulated tools shall have a two color/two-layer insulating coating that facilitates visual inspection and damage identification. Surface imperfections in the outer color/layer are acceptable. If the inner color/layer is visible, the tool must not be used and shall be immediately discarded.

12.6.3 Live-Line Tools

Live-Line Tools must be inspected and tested annually in accordance with ASTM F1825, F1826 and IEEE 516 Standards.

12.6.4 Proximity Voltage Detectors

Proximity voltage detectors shall not be used when physical contact testing is required. It can be used for absence of nominal voltage, troubleshooting and additional verification.

NOTE: Refer to manufacturer's instructions prior to use. Proximity voltage detectors may not accurately indicate the presence of voltage in certain circumstances. Proximity voltage detectors utilize the electrical field to determine voltage and can be affected by such factors as geometric relationship to the conductor under test, shielding, phase cancellation, or grounding a phase of a delta circuit. During these situations, proximity voltage detectors may indicate a false negative, failing to indicate voltage (shock hazard) when it is present

12.6.5 Temporary Protective Grounds

Temporary Protective Grounds used for employee protection shall be constructed in accordance with ASTM F855 and receive an annual inspection and test using methods specified in ASTM F2249.

12.6.6 Hydraulic and Pneumatic Tools

Shall provide dielectric withstand capabilities corresponding to the nominal voltage which they are exposed.

12.6.7 GFCI's

Cord and Plug tools/equipment must incorporate the GFCIs in all locations. Grounds used in cord and plug equipment must connect to an actual earth or equipment ground. They cannot be terminated on the neutral of the circuit.

NOTE: Some equipment may not function properly when used in conjunction with GFCI (i.e. Oscilloscope, Variac, HI-Potters, Meggers, Portable Welders, etc.) equipment of this nature may be used without connecting to a GFCI.

12.7 Troubleshooting

When troubleshooting electrical problems, a plan with expected results shall be established prior to beginning the work. If the plan is completed without achieving the expected results and the problem is not identified, a new plan must be developed prior to proceeding with the work.

Proximity voltage tester can be used for troubleshooting applications. They cannot be used to provide protection since they only detect AC and not DC voltage. A test for protection must determine a circuit is below 50 volts (AC or DC), which requires a contact test.

12.8 Temporary Power

Temporary power must be mechanically protected and have the disconnecting means clearly identified. It must also have the estimated incident energy value identified prior to being placed in service.

12.9 Training Requirements

12.9.1 Qualified Electrical Worker (QEW)

Qualified Electrical Worker is a documented authorization for an employee to work on or near energized parts or conductors. This means to perform any work that occurs inside the minimum/restricted approach boundaries. An employee must also have training specific to the equipment on which work is performed. The degree of training shall be determined by the risk to the employee for the hazards involved, and shall include safety-related work practices. At a minimum, training shall include the subjects listed as follow:

a. The skills and techniques necessary to distinguish exposed energized parts from other parts of electric lines and equipment, and
b. the skills and techniques necessary to determine the nominal voltage of exposed energized lines and equipment, and

c. the ability to determine minimum/restricted approach distances corresponding to the nominal voltage(s) to which qualified employees will be exposed and the skills and techniques necessary to prevent uninsulated body parts and tools from entering those boundaries. Also, the ability to determine the Arc Flash Boundaries corresponding to the appropriate incident energy estimates for the work and the skills and techniques necessary to identify and don the appropriate ARA and PPE, and
d. the proper use of special precautionary techniques, PPE, insulating and shielding materials, and insulated tools for working on or near exposed energized lines and equipment, and
e. the recognition of electrical shock and arc flash hazards to which the employee may be exposed and the skills and techniques necessary to control or avoid those hazards, and
f. 1st Aid training is required to include CPR.

12.9.2 Other Training

QEWs shall also receive training in new technology, new types of equipment or changes in procedures necessitating the use of electrical safety-related work practices different from those the employee would normally use in the performance of their duties.

12.9.3 Proficiency

Ensure each QEW employee has demonstrated proficiency in the electrical safety-related work practices required to perform their job safely before that employee is considered to have completed training. This proficiency may be performed by interview, examination, observation, or any combination of these methods. Evidence of proficiency shall be documented.

13 Revision History

Date	Rev	Description of Revision
9-13-2023	1	Revised Section 1.2, 1.4.1, 9.2.5.1 and 9.2.16
12-13-2023	2	Added reference to drawing T-0.1, note 6, in section 9.2.16. Added additional signature blocks to sections 6.2, 6.3, 6.4, 6.5, and 9.2.16.
12-26-2023	3	Added no weapons statement to section 1.4. Changed to new logo.

Responsibility	Name	Signature	Date
Inovateus Director of Project Management	Todd Collins	DocuSigned by: Todd Collins 6BD858F1A601419...	1/23/2024 | 11:19 A
Inovateus Construction Manager	Joaquin Corona	DocuSigned by: 58EFEE42E36542F...	1/15/2024 | 9:00 A
Inovateus Project Manager	Megan Drean	DocuSigned by: Megan Drean DC48D49B8E6444A...	1/12/2024 | 1:50 PM
Civil Subcontractor (Milestone Construction)	Matthew Beres	DocuSigned by: Matthew Beres B810F65988ED447...	1/15/2024 | 3:02 PM
Electrical Subcontractor (Schuler-Haas)	Devyn Smith	DocuSigned by: Devyn Smith 6C6A8462C0F4489...	1/15/2024 | 3:16 PM

Mechanical Subcontractor (LBFNY)	Bryan Lampson	DocuSigned by: Bryan Lampson 6DBFB77E41C5474...	1/15/2024 | 3:43 PM
Fencing Subcontractor	Christine Watt	DocuSigned by: Christine Watt C18A01424C0E43B...	1/20/2024 | 5:51 PM
Surveying GPI	Mark Andrews	DocuSigned by: Mark Andrews 7D5F9C1FF4F046F...	1/22/2024 | 1:28 P