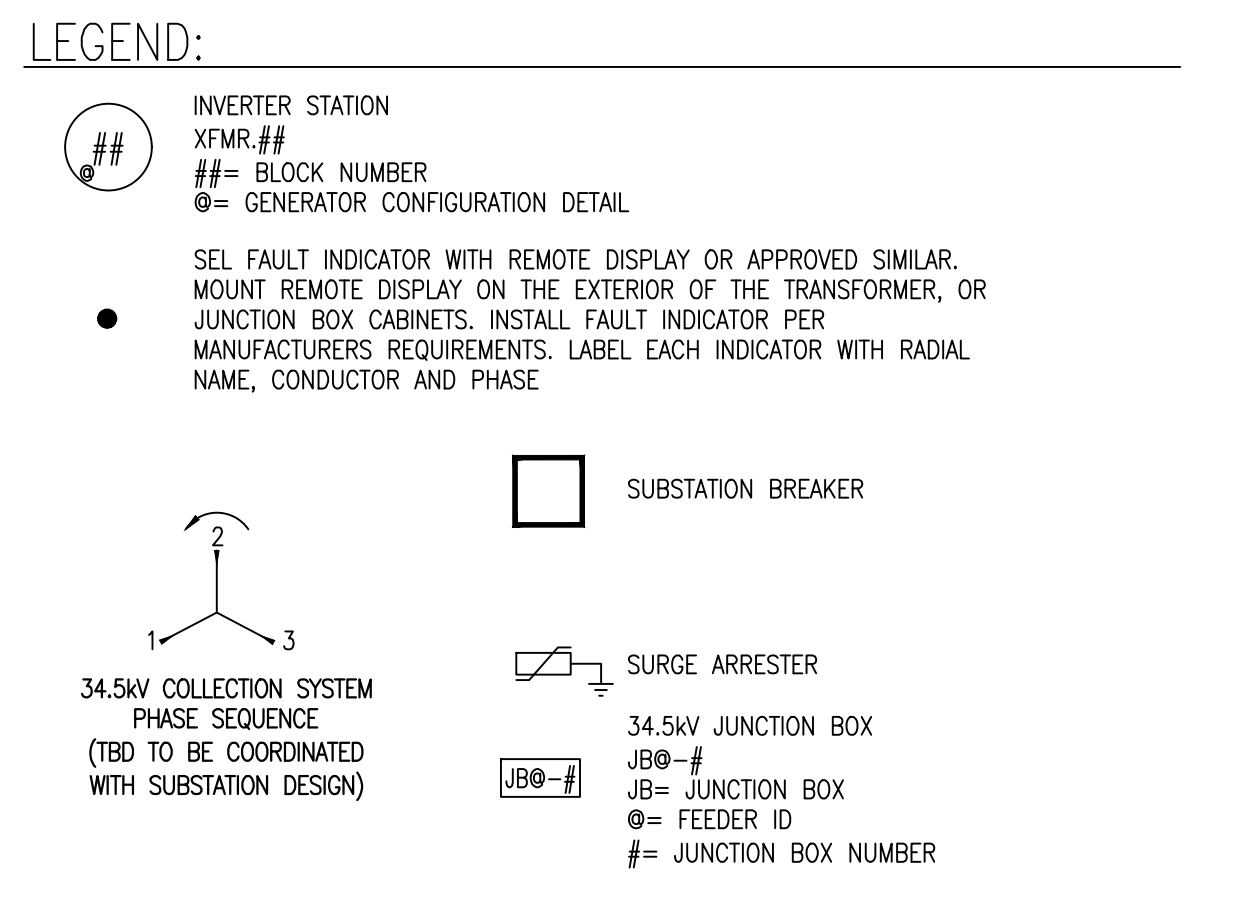


- GENERAL NOTES:**
- STEP-UP TRANSFORMERS AND/OR SWITCHGEAR PROVIDED AND INSTALLED BY CONTRACTOR WITHIN INVERTER STATION.
  - GENERATOR SKID PROVIDED WITH 600A NON-LOAD (N-L) BREAK TERMINATIONS. CONTRACTOR TO PROVIDE LOAD-BREAK (L) REDUCING TAP BUSHINGS FOR LOAD-BREAK ELBOW CONNECTIONS WHERE REQUIRED.
  - BEND RADIUS MINIMUM TO BE 12 TIMES CABLE OUTER DIAMETER FOR ALL MV CONDUIT BENDS.
  - INSTALL ALL EQUIPMENT AND WIRING IN ACCORDANCE WITH THE NEC, NESC, AND ALL APPLICABLE REQUIREMENTS OF THE LOCAL UTILITY COMPANY AND LOCAL AUTHORITY HAVING JURISDICTION. REFER TO PROJECT DOCUMENTATION FOR MVAC EQUIPMENT LABELING REQUIREMENTS.
  - TERMINATION TO SUBSTATION BY CONTRACTOR. ALL OTHER SUBSTATION WORK BY OTHERS.
  - CONTRACTOR TO VERIFY PHASE ROTATION WITH SUBSTATION ENGINEER.

- KEY NOTES:**
- 4400 kVA, 34,500V DELTA/630V NOMINAL THREE-WINDING SKID MOUNTED STEP-UP TRANSFORMER. REFER TO MANUFACTURER DRAWINGS. X/R-8.97 %Z-8
  - SHOWN FOR REPRESENTATIONAL PURPOSES ONLY. FINAL DETAILS TO BE DETERMINED DURING FINAL DESIGN. SHORT CIRCUIT WITHSTAND RATING FOR SWITCHGEAR TO BE VERIFIED BASED ON AVAILABLE SHORT CIRCUIT CURRENT FROM THE UTILITY.
  - CURRENT LIMITING FUSE, RATING TBD
  - EXPULSION FUSE, RATING TBD.
  - SURGE ARRESTER. ARRESTER SIZE TO BE FINALIZED AFTER COMPLETION OF A TOV STUDY.
  - POWER TO AUX. TRANSFORMER. FURTHER DETAILS TBD IN FINAL DESIGN.
  - JUNCTION BOX IS SHOWN AND IT COULD BE A SPLICE POINT. ADDITIONAL SPLICE POINTS OR JUNCTION BOX, IF NEEDED, ARE TO BE DETERMINED DURING THE DETAIL DESIGN.



MVAC WIRING SCHEDULE												
CONDUCTOR LOCATION CODE	ORIGINATING EQUIPMENT	TERMINATING EQUIPMENT	RATED V <sub>ac</sub> (kV)	I <sub>ac</sub> (A)	ONE-WAY LENGTH (FT)	CONDUCTOR SIZE	CONDUCTOR MATERIAL	# OF PARALLEL CONDUCTORS	GROUND CONDUCTOR SIZE	GROUND CONDUCTOR MATERIAL	CONDUCTOR SPECIFICS	
MV11A SUB-XFMR 1	SUB	XFMR 1	34.5	441.84	1,200	3#1250 KCMIL	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 16#14 Concentric Neutral	
MV11A JB1-1-XFMR 1	JB1-1	XFMR 1	34.5	368.20	609	3#500 KCMIL	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV11A JB1-1-XFMR 2	JB1-1	XFMR 2	34.5	73.64	782	3#4/0 AWG	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV11A JB1-1-XFMR 3	JB1-1	XFMR 3	34.5	294.56	377	3#500 KCMIL	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV11A XFMR 3-XFMR 4	XFMR 3	XFMR 4	34.5	220.92	1,477	3#4/0 AWG	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV11A XFMR 4-XFMR 5	XFMR 4	XFMR 5	34.5	147.28	818	3#4/0 AWG	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV11A XFMR 5-XFMR 6	XFMR 5	XFMR 6	34.5	73.64	1,092	3#4/0 AWG	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV11B SUB-XFMR 15	SUB	XFMR 15	34.5	441.84	15,481	3#1250 KCMIL	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 16#14 Concentric Neutral	
MV11B XFMR 15-XFMR 16	XFMR 15	XFMR 16	34.5	368.20	671	3#500 KCMIL	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV11B XFMR 16-XFMR 17	XFMR 16	XFMR 17	34.5	294.56	774	3#500 KCMIL	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV11B XFMR 17-XFMR 18	XFMR 17	XFMR 18	34.5	220.92	3,861	3#4/0 AWG	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV11B XFMR 18-XFMR 19	XFMR 18	XFMR 19	34.5	147.28	1,467	3#4/0 AWG	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV11B XFMR 19-XFMR 20	XFMR 19	XFMR 20	34.5	73.64	833	3#4/0 AWG	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV12A SUB-JB3-1	SUB	JB3-1	34.5	441.84	512	3#1250 KCMIL	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 16#14 Concentric Neutral	
MV12A JB3-1-XFMR 21	JB3-1	XFMR 21	34.5	220.92	2,766	3#4/0 AWG	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV12A XFMR 21-XFMR 8	XFMR 21	XFMR 8	35.5	147.28	6,917	3#4/0 AWG	AL	2	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV12A XFMR 8-XFMR 7	XFMR 8	XFMR 7	36.5	73.64	1,110	3#4/0 AWG	AL	3	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV12A JB3-1-XFMR 22	JB3-1	XFMR 22	34.5	220.92	2,149	3#4/0 AWG	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV12A XFMR 22-XFMR 23	XFMR 22	XFMR 23	34.5	147.28	10,190	3#4/0 AWG	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV12A XFMR 23-XFMR 24	XFMR 23	XFMR 24	34.5	73.64	1,555	3#4/0 AWG	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV12B SUB-XFMR 9	SUB	XFMR 9	34.5	441.84	8,697	3#1250 KCMIL	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 16#14 Concentric Neutral	
MV12B XFMR 9-XFMR 10	XFMR 9	XFMR 10	34.5	368.20	1,266	3#500 KCMIL	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV12B XFMR 10-JB4-1	XFMR 10	JB4-1	34.5	294.56	1,757	3#500 KCMIL	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV12B JB4-1-XFMR 11	JB4-1	XFMR 11	34.5	147.28	87	3#4/0 AWG	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV12B XFMR 11-XFMR 12	XFMR 11	XFMR 12	34.5	73.64	1,074	3#4/0 AWG	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV12B JB4-1-XFMR 13	JB4-1	XFMR 13	34.5	147.28	1,931	3#4/0 AWG	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	
MV12B XFMR 13-XFMR 14	XFMR 13	XFMR 14	34.5	73.64	923	3#4/0 AWG	AL	1	1#2 AWG	Bare Copper	35KV, 1/C, Trefoil, 100% Insulation, Type MV-105, 10#14 Concentric Neutral	

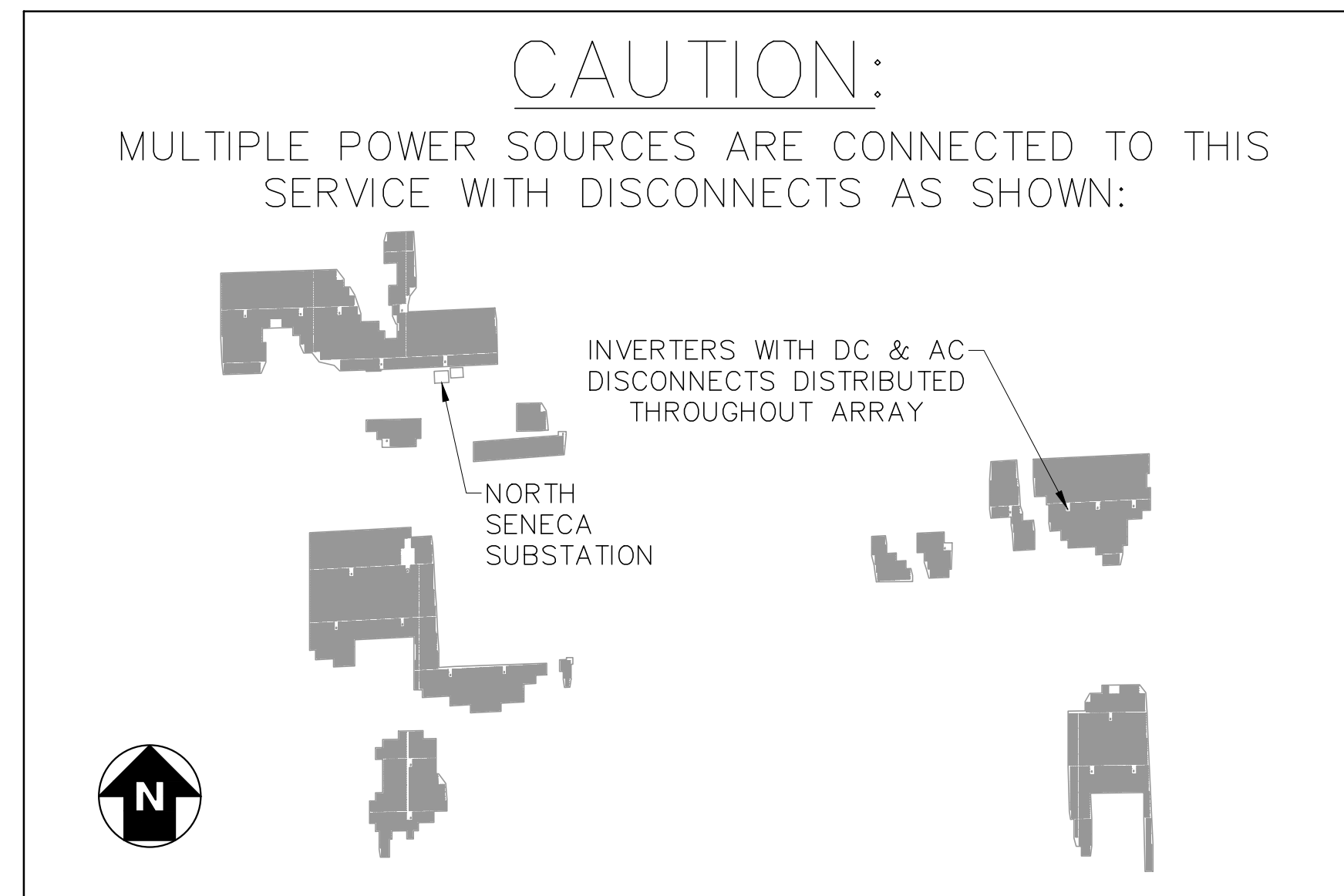
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							D	11/01/24	ISSUED FOR REVIEW	SDD	MRC	BRB			PROJ. NO.:
							C	10/24/24	ISSUED FOR REVIEW	TT	BC	MS			DWG. NO.:
							B	02/22/24	ISSUED FOR REVIEW	TT	BC	MS			SHEET:
						A	01/12/24	ISSUED FOR REVIEW	TT	BC	MS	REV.:	01		
													D		



NORTH SENECA SOLAR PROJECT SAVION 115/34.5KV COLLECTION SUBSTATION COLLECTION SYSTEM ONE LINE	PROJ. NO.: 19349 DWG. NO.: 204	SCALE: NONE SHEET: 01 REV.: D
-----------------------------------------------------------------------------------------------------------	-----------------------------------------	----------------------------------------------

EMERGENCY CONTACT  
IDENTIFICATION LABELS  
LAMICORD SHALL BE: 10"x6"



TO BE POSTED AT THE LOCATION OF THE MAIN DISCONNECT OF THE SOLAR SYSTEM.  
CONTRACTOR SHALL COORDINATE WITH OWNER TO DETERMINE LANGUAGE FOR THIS PLACARD.

DC COMBINER BOX IDENTIFICATION LABELS  
LAMICORD SHALL BE: 6"x6"  
(1 PER COMBINER BOX)

<b>PHOTOVOLTAIC DC COMBINER BOX CB-X-X</b>	
<b>PHOTOVOLTAIC POWER SOURCE RATINGS</b>	
<b>INPUTS</b>	
<b>RATED MAX. POWER POINT CURRENT</b>	<b>--- ADC</b>
<b>RATED MAX. POWER POINT VOLTAGE</b>	<b>---- VDC</b>
<b>MAX. SYSTEM VOLTAGE</b>	<b>----VDC</b>
<b>SHORT CIRCUIT CURRENT</b>	<b>--- ADC</b>

SEE TABLE THIS DRAWING  
PER NEC 690.53

LAMICORD SHALL BE: 4"x6"

ARIAL FONT SHALL BE  
.75 HT.

**! WARNING**  
ARC FLASH HAZARD  
APPROPRIATE PPE REQUIRED  
FAILURE TO COMPLY CAN RESULT IN  
DEATH OR SEVERE INJURY

ARIAL FONT SHALL BE  
.25 HT.

TO BE POSTED ON COMBINER BOXES PER NFPA 70 E & NEC 110.16

LAMICORD SHALL BE: 8 1/2"x11"

**! WARNING**  
**HIGH VOLTAGE**

**DO NOT ENTER  
FOR QUALIFIED  
PERSONNEL ONLY  
(PHOTOVOLTAIC  
INSTALLATION)**

TO BE POSTED AT THE DOOR OF THE FENCE PER NEC 110.27 (C)

SERVICE EQUIPMENT LABEL  
LAMICORD SHALL BE: 4"x6"

**UTILITY COMPANY:**  
**UTILITY FAULT CURRENT:**  
**ENGINEER:**

TO BE POSTED ON SERVICE EQUIPMENT/SWITCHGEAR PER NEC 110.24(A)

LAMICORD SHALL BE: 14"x20"



VERIFY CONTACT NUMBER WITH OWNER

TO BE POSTED ON GATE AT ALL THREE ARRAYS

GENERAL NOTES FOR LABELS:

- LABEL SCALE 1:2 UNLESS NOTED.
- LETTERING ON SIGNS SHALL BE CAPITAL LETTERS.
- CLEARLY LABEL ALL CIRCUIT BREAKERS IN THE PANELBOARD(S). THE LABEL SHALL INDICATE THE NAME OF THE DEVICE IT SERVES.
- ALL LABELS ARE TYPICAL AND SHALL BE FILLED IN ACCORDING TO SITE-SPECIFIC INFORMATION.

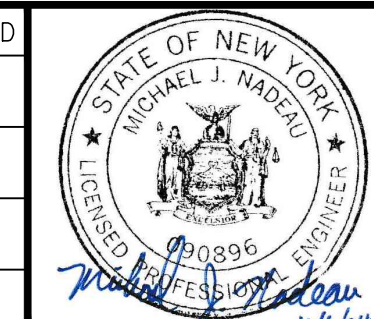
PER 2017 NEC 690.31(B)(1), PV SYSTEM CIRCUIT CONDUCTORS SHALL BE IDENTIFIED AT ALL ACCESSIBLE POINTS OF TERMINATION, CONNECTION, AND SPLICES.

- STRING HOMERUNS AT ARRAY
- DC INPUT TERMINALS OF COMBINER BOX
- DC OUTPUT TERMINALS OF COMBINER BOX
- DC INPUT TERMINALS OF INVERTER
- AC OUTPUT TERMINALS OF INVERTER
- AC INPUT & OUTPUT TERMINALS OF EACH SUCCESSIVE DEVICE (WHERE APPLICABLE)

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						A	01/12/24	ISSUED FOR REVIEW	SDD	MRC	BRB



NORTH SENECA SOLAR PROJECT  
SAVION  
115/34.5kV SUBSTATION  
ELECTRICAL LABELS

PLT SCALE: ARCH ENGRG 0 1 2	SCALE: NONE
PROJ. NO.: 19349	SHEET: 01
DWG. NO.: 205	REV.: D

LAMICORD SHALL BE: 4"x6"

**! WARNING**

ELECTRICAL SHOCK HAZARD  
IF A GROUND FAULT IS INDICATED,  
NORMALLY GROUNDED CONDUCTORS  
MAY BE UNGROUNDED AND ENERGIZED

TO BE POSTED ON INVERTER  
PER NEC 690.5 (C)

LAMICORD SHALL BE: 4"x6"

**! WARNING**

ELECTRICAL SHOCK HAZARD  
DO NOT TOUCH TERMINALS.  
TERMINALS ON BOTH THE LINE & LOAD  
SIDES MAY BE ENERGIZED IN THE OPEN  
POSITION

TO BE POSTED ON INVERTER AC/DC DISCONNECTS AND COMBINERS  
PER NEC 690.17 (E)

LAMICORD SHALL BE: 4"x6"

**! WARNING**

ELECTRICAL SHOCK HAZARD  
THE DC CONDUCTORS OF THIS  
PHOTOVOLTAIC SYSTEM ARE  
UNGROUNDDED AND MAY BE ENERGIZED

TO BE POSTED ON ALL JUNCTION BOX, COMBINER BOX, AND DISCONNECTS  
PER NEC 690.35 (F)

INVERTER IDENTIFICATION LABELS LAMICORD SHALL BE: 4"x6"  
(1 PER INVERTER)

**PHOTOVOLTAIC  
XX kW INVERTER #XX**

THE INVERTER INTERCONNECTS ON  
LINE V-XXX THROUGH A DEDICATED  
GANG OPERATED LOAD BREAK SWITCH.

TO BE POSTED AT INVERTER # --  
PER NEC 690.54

LAMICORD SHALL BE: 4"x6"

**! CAUTION**

POWER TO THIS SERVICE IS ALSO  
SUPPLIED FROM ON-SITE  
PHOTOVOLTAIC GENERATION

TO BE POSTED ON UTILITY METER PAN  
PER NEC 230.2(E)

LAMICORD SHALL BE: 4"x6"

**! WARNING**

ELECTRICAL SHOCK HAZARD IF A  
GROUND FAULT IS INDICATED,  
NORMALLY GROUNDED CONDUCTORS  
MAY BE UNDERGROUND AND  
ENERGIZED

TO BE POSTED NEXT TO THE GROUND FAULT INDICATOR ON A  
UTILITY-INTERACTIVE INVERTER PER NEC 690.5 (C)

LAMICORD SHALL BE: 4"x6"

**! WARNING**

INVERTER OUTPUT CONNECTION  
DO NOT ADD LOADS TO THIS  
SWITCHBOARD

TO BE APPLIED TO NEW 208V OR 480V PANELBOARD

INVERTER IDENTIFICATION LABELS  
LAMICORD SHALL BE: 1 1/2"x6"  
TEXT SIZE SHALL BE 1/2"  
(1 PER INVERTER)

**INVERTER #X**

IDENTIFICATION PLACARD PER NEC 230.3(E) TO BE  
PLACED ON SERVICE SWITCH (1) AT EACH SERVICE

LAMICORD SHALL BE: 4"x6"

**! WARNING**

ARC FLASH HAZARD  
APPROPRIATE PPE REQUIRED  
FAILURE TO COMPLY CAN RESULT IN  
DEATH OR SEVERE INJURY

NOMINAL SYSTEM VOLTAGE \_\_\_\_\_  
ARC FLASH BOUNDARY \_\_\_\_\_  
AVAILABLE INCIDENT ENERGY \_\_\_\_\_  
WORKING DISTANCE \_\_\_\_\_  
MINIMUM ARC RATING OF CLOTHING \_\_\_\_\_  
LEVEL OF PPE \_\_\_\_\_  
LIMITED APPROACH \_\_\_\_\_  
RESTRICTED APPROACH \_\_\_\_\_  
LOCATION ID \_\_\_\_\_  
STUDY COMPLETED BY \_\_\_\_\_  
STUDY COMPLETED ON \_\_\_\_\_

TO BE POSTED ON ALL ELECTRICAL PANELS & EQUIPMENT,  
INCLUDING BUT NOT LIMITED TO PANELBOARDS,  
DISCONNECT SWITCHES, CONTROL PANELS & METER  
SOCKET PER NFPA 70 E & NEC 110.16

LAMICORD SHALL BE: 6"x5"

**! WARNING**

IDENTIFICATION OF MULTIPLE  
SERVICE DISCONNECTS

A SECOND POWER SOURCE IS  
PRESENT IN THIS EQUIPMENT  
PV SYSTEM DISCONNECT LOCATED

IDENTIFICATION PLACARD PER NEC 230.2(E) TO  
BE PLACED ADJACENT TO PV SOURCE BREAKERS

LAMICORD SHALL BE: 4"x6"

**! CAUTION**

SOLAR ARRAY'S ARE PRESENT ON THIS  
SWITCHBOARD

TO BE POSTED BY THE SWITCHGEAR  
PER NEC 705.10

AC VISIBLE DISCONNECT IDENTIFICATION LABEL  
LAMICORD SHALL BE: 6"x5"  
(1 AT SERVICE DISCONNECT)

**CAUTION  
SOLAR GENERATION  
UTILITY AC  
DISCONNECT**

ELECTRIC SHOCK HAZARD.  
DO NOT TOUCH TERMINALS. TERMINALS  
ON BOTH THE LINE AND LOAD SIDES MAY  
BE ENERGIZED IN THE OPEN POSITION

INTERACTIVE SOLAR PV SYSTEM RATINGS

MAX. OPERATING CURRENT	--- AMPS
OPERATING VOLTAGE	115,000 VAC

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A	01/12/24	ISSUED FOR REVIEW				SDD	MRC	BRB			



NORTH SENECA SOLAR PROJECT  
SAVION

115/34.5kV SUBSTATION  
ELECTRICAL LABELS

PROJ. NO.: 19349	SCALE: NONE
DWG. NO.: 205	SHEET: 02
	REV.: D

LAMICORD SHALL BE: 4"x6"

**! WARNING**

SHOCK HAZARD.  
TURN OFF DC DISCONNECT AT  
RECOMBINER/INVERTER BEFORE  
WORKING

TO BE POSTED AT ALL COMBINER BOXES  
LAMICORD SHALL BE: 4"x6"

**MEDIUM VOLTAGE  
TRANSFORMER  
X**

--- KVA  
PRIMARY VOLTAGE =  
SECONDARY VOLTAGE =

TO BE POSTED AT THE  
TRANSFORMER 1

LAMICORD SHALL BE: 4"x6"

**! CAUTION**  
UNGROUND  
ED  
AC SYSTEM

TO BE POSTED AT EACH MEDIUM VOLTAGE TRANSFORMER  
& INVERTER ON THE LOW VOLTAGE SIDE

LAMICORD SHALL BE: 6"x5"

**NOTICE**

THE PHOTOVOLTAIC  
OUTPUT IS  
CONNECTED TO THE  
LOW VOLTAGE SIDE  
OF THIS TRANSFORMER

LAMICORD SHALL BE: 4"x6"

**NOTICE**

PHOTOVOLTAIC  
ELECTRIC SYSTEM  
DISCONNECT

TO BE POSTED AT MAIN SERVICE DISCONNECT

LAMICORD SHALL BE: 4"x6"

**! WARNING**

SHOCK, ARC FLASH,  
AND ARC BLAST HAZARD  
APPROPRIATE PPE REQUIRED  
FAILURE TO COMPLY CAN RESULT  
IN INJURY OR DEATH  
REFER TO UFC 3-560-01

TO BE POSTED AT EACH COMBINER  
BOX AND RECOMBINER AND INVERTER

LAMICORD SHALL BE: 4"x6"

**NOTICE**

PHOTOVOLTAIC AC  
DISCONNECT  
VOLTAGE =  
CURRENT =

TO BE POSTED AT THE INVERTER 1 DISCONNECT

LAMICORD SHALL BE: 4"x6"

**! WARNING**

DO NOT OPEN, REMOVE OR  
REPLACE FUSES UNDER LOAD

TO BE POSTED AT ALL COMBINER BOXES AND  
ALL OTHER FUSED LOCATIONS

LAMICORD SHALL BE: 4"x6"


**NOTICE**

AUTHORIZED PERSONNEL  
ONLY

TO BE POSTED AT THE GATES

**! DANGER** **! PELIGRO**

HIGH VOLTAGE  
NO  
TRESPASSING



ALTO VOLTAGE  
NO  
TRESPASAR

LAMICORD SHALL BE: 4"x6"

**DATA ACQUISITION  
CABINET  
X**

TO BE POSTED AT THE DAS CABINETS

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NORTH SENECA SOLAR PROJECT  
SAVION  
115/34.5kV SUBSTATION  
ELECTRICAL LABELS

PROJ. NO.: 19349	SCALE: NONE
DWG. NO.: 205	SHEET: 03
	REV.: D

## TOPBiHiKu7

**N-type Bifacial TOPCon Technology**  
**675 W ~ 695 W**  
**CS7N-675 | 680 | 685 | 690 | 695TB-AG**

**MORE POWER**

- 695 W** Module power up to 695 W  
Module efficiency up to 22.4 %
- EXTRA POWER** Up to 85% Power Bifaciality,  
more power from the back side
- Excellent anti-LeTID & anti-PID performance.  
Low power degradation, high energy yield
- Lower temperature coefficient (Pmax): -0.29%/°C,  
increases energy yield in hot climate
- Lower LCOE & system cost

**MORE RELIABLE**

- Minimizes micro-crack impacts
- Heavy snow load up to 5400 Pa,  
wind load up to 2400 Pa\*

**12 Years** Enhanced Product Warranty on Materials  
and Workmanship\*

**30 Years** Linear Power Performance Warranty\*

**1<sup>st</sup> year power degradation no more than 1%**  
**Subsequent annual power degradation no more than 0.4%**

\*According to the applicable Canadian Solar Limited Warranty Statement.

**MANAGEMENT SYSTEM CERTIFICATES\***

ISO 9001: 2015 / Quality management system  
ISO 14001: 2015 / Standards for environmental management system  
ISO 45001: 2018 / International standards for occupational health & safety  
IEC 62941: 2019 / Photovoltaic module manufacturing quality system

**PRODUCT CERTIFICATES\***

IEC 61215 / IEC 61730 / CE / INMETRO / MCS / UKCA / CGC  
PSEC (US Florida) / UL 61730 / IEC 61701 / IEC 62716  
IEC 60068-2-68 / Take-e-way

\* The specific certificates applicable to different module types and markets will vary, and therefore not all of the certifications listed herein will simultaneously apply to the products you order or use. Please contact your local Canadian Solar sales representative to confirm the specific certificates available for your Product and applicable in the regions in which the products will be used.

**CSI Solar (USA) Co., Ltd.** is committed to providing high quality solar photovoltaic modules, solar energy and battery storage solutions to customers. The company was recognized as the No.1 module supplier for quality and performance/price ratio in the IHS Module Customer Insight Survey. Over the past 22 years, it has successfully delivered over 88 GW of premium-quality solar modules across the world.

\* For detailed information, please refer to the Installation Manual.

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### ENGINEERING DRAWING (mm)

**Rear View**

**Frame Cross Section A-A**

**Mounting Hole**

**CS7N-680TB-AG / I-V CURVES**

	Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)	Module Efficiency
CS7N-675TB-AG	675 W	39.0 V	17.31 A	46.9 V	18.24 A	21.7%
Bifacial Gain**	5% 709 W	39.0 V	18.19 A	46.9 V	19.15 A	22.8%
	10% 743 W	39.0 V	19.04 A	46.9 V	20.06 A	23.9%
	20% 810 W	39.0 V	20.77 A	46.9 V	21.89 A	26.1%
CS7N-680TB-AG	680 W	39.2 V	17.35 A	47.1 V	18.29 A	21.9%
Bifacial Gain**	5% 714 W	39.2 V	18.22 A	47.1 V	19.20 A	23.0%
	10% 748 W	39.2 V	19.09 A	47.1 V	20.12 A	24.1%
	20% 816 W	39.2 V	20.82 A	47.1 V	21.95 A	26.3%
CS7N-685TB-AG	685 W	39.4 V	17.39 A	47.3 V	18.34 A	22.1%
Bifacial Gain**	5% 719 W	39.4 V	18.26 A	47.3 V	19.26 A	23.1%
	10% 754 W	39.4 V	19.14 A	47.3 V	20.17 A	24.3%
	20% 822 W	39.4 V	20.87 A	47.3 V	22.01 A	26.5%
CS7N-690TB-AG	690 W	39.6 V	17.43 A	47.5 V	18.39 A	22.2%
Bifacial Gain**	5% 725 W	39.6 V	18.31 A	47.5 V	19.31 A	23.3%
	10% 759 W	39.6 V	19.17 A	47.5 V	20.23 A	24.4%
	20% 828 W	39.6 V	20.92 A	47.5 V	22.07 A	26.7%
CS7N-695TB-AG	695 W	39.8 V	17.47 A	47.7 V	18.44 A	22.4%
Bifacial Gain**	5% 730 W	39.8 V	18.34 A	47.7 V	19.36 A	23.5%
	10% 765 W	39.8 V	19.18 A	47.7 V	20.28 A	24.6%
	20% 834 W	39.8 V	20.96 A	47.7 V	22.13 A	26.8%

	Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)
CS7N-675TB-AG	510 W	36.9 V	13.84 A	44.4 V	14.71 A
CS7N-680TB-AG	514 W	37.1 V	13.88 A	44.6 V	14.75 A
CS7N-685TB-AG	518 W	37.2 V	13.91 A	44.8 V	14.79 A
CS7N-690TB-AG	522 W	37.4 V	13.94 A	45.0 V	14.83 A
CS7N-695TB-AG	526 W	37.6 V	13.97 A	45.2 V	14.87 A

**ELECTRICAL DATA | NMOT\***

\* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m<sup>2</sup> spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

**MECHANICAL DATA**

Specification	Data
Cell Type	TOPCon cells
Cell Arrangement	132 [2 x (11 x 6)]
Dimensions	2384 x 1303 x 35 mm (93.9 x 51.3 x 1.38 in)
Weight	37.9 kg (83.6 lbs)
Front Glass	2.0 mm heat strengthened glass with anti-reflective coating
Back Glass	2.0 mm heat strengthened glass
Frame	Anodized aluminium alloy
J-Box	IP68, 3 bypass diodes
Cable	4.0 mm <sup>2</sup> (IEC), 12 AWG (UL)
Cable Length	410 mm (16.1 in) (+/-) / 250 mm (9.8 in) (-) or (Including Connector) 2000 mm (78.7 in) (+) / 1400 mm (55.1 in) (-)
Connector	T6 or MC4 series
Per Pallet	31 pieces
Per Container (40' HQ)	558 pieces or 496 pieces (only for US & Canada)

**TEMPERATURE CHARACTERISTICS**

Specification	Data
Temperature Coefficient (Pmax)	-0.29 % / °C
Temperature Coefficient (Voc)	-0.25 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	41 ± 3°C

**PARTNER SECTION**

\* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. CSI Solar Co., Ltd. reserves the right to make necessary adjustment to the information described herein at any time without further notice.  
Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

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# SG3300UD-MV-US SG4400UD-MV-US

Turnkey Station for 1500 Vdc System MV Transformer Integrated



### HIGH YIELD

- Advanced three-level technology, max. inverter efficiency 99%
- Full power operation at 40 °C(104 °F)
- Effective cooling, wide operation temperature

### EASY O&M

- Integrated current, voltage and MV parameters monitoring function for online analysis and trouble shooting
- Modular design, easy for maintenance

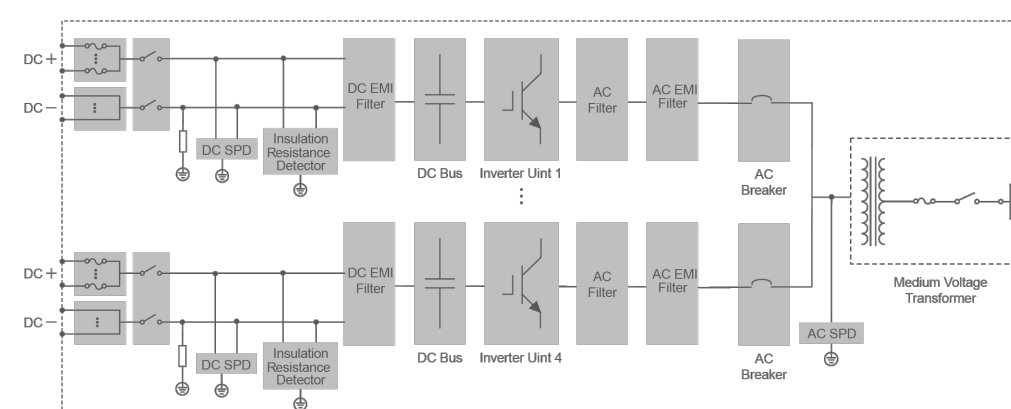
### SAVED INVESTMENT

- Low transportation and installation cost due to 20-foot container size design
- DC 1500V system, low system cost
- Integrated MV transformer and LV auxiliary power supply
- Q at night optional

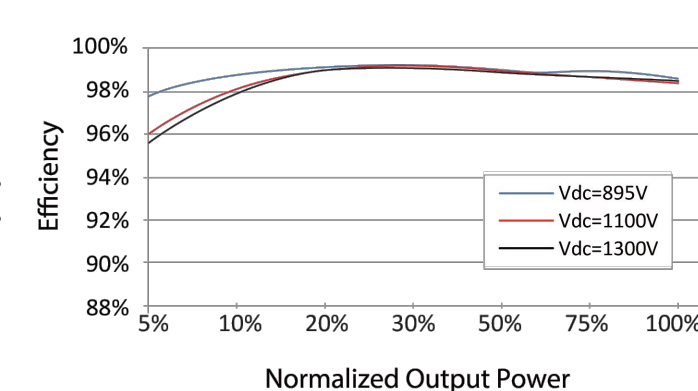
### GRID SUPPORT

- Compliance with standards:UL 1741, UL 1741 SA, IEEE 1547, Rule 21 and NEC code
- Low / High voltage ride through (L/HVRT), L/HFRT, soft start/stop
- Active & reactive power control and power ramp rate control

### CIRCUIT DIAGRAM



### EFFICIENCY CURVE



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**SUNGROW**  
Clean power for all

Type Designation	SG3300UD-MV-US	SG4400UD-MV-US
<b>Input (DC)</b>		
Max. PV input voltage		1500 V
Min. PV input voltage / Start-up input voltage		895 V / 905 V
Available DC Fuse Sizes		250A - 630A
MPP Voltage Range		905 V - 1500 V
No. of independent MPP inputs	3	4
No. of DC inputs	18 (optional: 21 inputs negative grounding)	24 (optional: 28 inputs negative grounding)
Max. PV input current	3 * 1435 A	4 * 1435 A
Max. DC short-circuit current	3 * 5000 A	4 * 5000 A
PV Array Configuration	Negative grounding or floating	
<b>Output (AC)</b>		
AC output power	3300 kVA @ 40 °C(104 °F)	4400 kVA @ 40 °C(104 °F)
Nominal Grid Frequency / Grid Frequency Range	60 Hz / 55 - 65 Hz	
Harmonic (THD)	< 3% (at nominal power)	
Power Factor at Nominal Power / Adjustable Power Factor	> 0.99 / 0.8 leading - 0.8 lagging	
<b>Efficiency</b>		
Inverter Max. efficiency	99.0 %	
Inverter CEC efficiency	98.5 %	
<b>Transformer</b>		
Transformer rated power	3300 kVA	4400 kVA
Transformer max. power	3300 kVA	4400 kVA
LV / MV voltage	0.63 kV / (12 - 35) kV	0.63 kV / 34.5 kV
Transformer vector	Dy1 (Optional: Dy11, Yny)	
Transformer cooling type	KNAN (Optional: ONAN)	
<b>Protection</b>		
DC Input Protection	Load break switch + fuse	
Inverter Output Protection	Circuit breaker	
AC MV Output Protection	Load break switch + fuse	
Overvoltage Protection	DC Type II / AC Type II	
Grid Monitoring / Ground Fault Monitoring	Yes / Yes	
Insulation Monitoring	Yes	
Overheat Protection	Yes	
<b>General Data</b>		
Dimensions (W*H*D)*	6058*2896*2438 mm 238.5"*114.0"*96.0"	
Weight*	≤18000 kg (≤39683 lbs)	≤20000 kg (≤44092 lbs)
Degree of Protection	NEMA 4X( Electronic for Inverter) / NEMA 3R(Others)	
Auxiliary Power Supply	5kVA, 120Vac; Optional: 35kVA, 480Vac/277Vac	
Operating Ambient Temperature Range	-35 to 60 °C (> 40 °C derating) / optional: -40 to 60 °C (> 40 °C derating)	
Allowable Relative Humidity Range	0 - 100 %	
Cooling Method	Temperature controlled forced air cooling	
Max. Operating Altitude	1000 m (Standard) / > 1000 m (Customized) (3280.8 ft (standard) / > 3280.8 ft (Customized))	
Display	LED Indicators, WLAN+WebHMI	
Night Reactive Power Function	Optional	
DC-Coupled Storage Interface	Optional	
Charging Power from the Grid	Optional	
Communication	Standard: RS485, Ethernet	
Compliance	UL 1741, IEEE 1547, UL1741 SA, NEC 2017, CSA C22.2 No.1073-01, PRC-024, Rule 21	
Grid Support	Q at night function (optional), L/HVRT, L/HFRT, Active & reactive power control and power ramp rate control, Volt-var, Frequency-watt	

\*: The actual product received shall prevail.

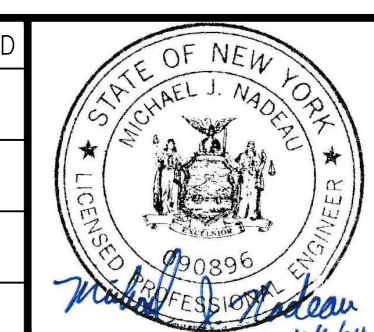
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NORTH SENECA SOLAR PROJECT  
SAVION  
34.5kV COLLECTION SYSTEM  
ELECTRICAL EQUIPMENT  
SPECIFICATION SHEET DRAWING

PROJ. NO.: 19349	SCALE: NONE
DWG. NO.: 251	SHEET: 01
	REV.: D

Nextacker NX Horizon Datasheet



**NX Horizon™**

NX Horizon™ is the world's most chosen solar tracker system for utility-scale power plants, deployed and contracted on over 75 gigawatts of solar power plants globally as of March 2023. NX Horizon's unrivaled combination of integrated hardware and software has become the gold standard for the utility-scale solar industry, thanks to its robust design, ease of installation, field-proven weather durability, and LCOE-optimized performance.

### Pioneering independent-row technology

NX Horizon's patented independent row, self-powered tracking system provides reliable performance across the widest possible range of site conditions. Simple, robust hardware, including self-aligning module rails and vibration-proof fasteners, enables rapid installation and long life without maintenance. Mechanically balanced rows minimize tracking power requirements and pair with a time-proven, rugged drive & control system for maximum durability and uptime. NX Horizon's decentralized architecture with intelligent communications supports maximum layout adaptability, flexible construction and commissioning sequencing, advanced tracker functionality, and over-the-air updates.

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Nextacker NX Horizon Datasheet

### Proven resilience

NX Horizon is designed to withstand extreme weather events, proven season after season across hundreds of systems around the world. Through Nextacker's in-house project-engineering services, NX Horizon is configured and optimized to suit the unique combination of severe weather hazards and climate for each project site. Based on the industry's most comprehensive wind analysis and field testing, NX Horizon is hardened against wind-related failures by robust structural design, an optimized damping system, and advanced stowing functionality. Furthermore, the combination of balanced, independent self-powered rows with integrated UPS, 60° stowing angle, and available smart software enables rapid hail-stow protection to maximize panel survivability, even in the event of a grid outage. NX Horizon is inherently tolerant of flooding with drive and control components 4-5' above grade and available flood stowing functions to protect panels.

#### Features and Benefits

- 7 years in a row**  
Global Market Share Leader
- 75 GW**  
Delivered on 6 Continents
- Best-in Class**  
Software Ecosystem and Global Services
- Up to 6% more energy**  
Using TrueCapture™ Smart Control System



### Optimized for the lowest LCOE

Compared with conventional tracking systems, NX Horizon delivers Levelized Cost of Energy (LCOE) reductions of up to 7% by maximizing energy generation and solving for the lowest possible project CAPEX and OPEX. With pre-assembled components, no drive linkages, no AC wiring, self-aligning rails, and available XTR terrain following upgrades, NX Horizon is fundamentally faster to install, requiring less construction labor, less grading, and less total project capital cost. Projects using NX Horizon enjoy open-row access for maximum vegetation management and panel cleaning efficiency. Compared with linked row systems, NX Horizon cuts mowing costs by up to 55% and cleaning costs by up to 73%, reducing total project operations costs.

Lastly, but crucially for project returns, NX Horizon boosts project energy generation and revenue with its unique bifacial-optimized design as standard, and available IE-validated, 38GW proven TrueCapture Smart Control System with diffuse mode and row to row optimization functions.

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Nextacker NX Horizon Datasheet

GENERAL AND MECHANICAL		ELECTRONICS AND CONTROLS	
Architecture	Horizontal single-axis, independent row, independently balanced	Solar tracking method	Astronomical algorithm with backtracking standard. TrueCapture™ upgrades available for enhanced energy yield
Configuration	1x module in portrait	Tracker controller	Self-Powered Controller (SPC) with integrated inclinometer and UPS
Tracking range of motion	Options for ±60° or ±50°	Motor	Brushless DC
Row Size	Configurable per module type, string length and site layout	Power supply	SELF POWERED: Standalone smart solar power AC POWERED: Customer-provided 120-277 VAC circuit
Array Height	Rotation axis elevation, 1.3 to 1.8 m / 4'3" to 5'10"	Communications	Network control units (NCUs) at inverter pads/skids, self-powered weather stations, centralized data hubs, encrypted Zigbee wireless mesh communications
Drive type	High accuracy slew gear	Defensive stowing functions	Wind, hail, hurricane, snow, flood, loss of grid power
Modules supported	All utility-scale crystalline and thin-film modules	Operator interface	NX Navigator advanced HMI available, with SCADA integration
Bifacial optimization	High-rise mounting rails, bearing & driveline gaps, round torque tube		
Structural connections	Engineered fastening system, vibration-proof		
Materials	Galvanized steel; other coatings available		
Foundations	Complete range of foundation solutions available		
Slope	Up to 15% N-S and 15% E-W		
Ground coverage ratio (GCR)	No specific limit Typical range 25-45%		
Operating temperature range	SELF POWERED: -30°C to 55°C (-22°F to 131°F) AC POWERED: -40°C to 55°C (-40°F to 131°F)		
Wind speed	Configurable up to 240 kph (150 mph) 10m, 3-second gust		
Wind protection	Intelligent wind stowing with symmetric damping system		

#### SERVICE, WARRANTY, AND STANDARDS



Tracker engineering & PE stamped design package	Standard
Foundation engineering & PE stamped design package	Available
Onsite construction support & commissioning service	Available
Warranty	10-year structural, 5-year drive and controls standard; extended warranty available
Certifications	UL 2703, UL 3703, IEC 62817, CSA
Codes and standards	UL 3703 / UL 2703 / IEC 62817 / CSA

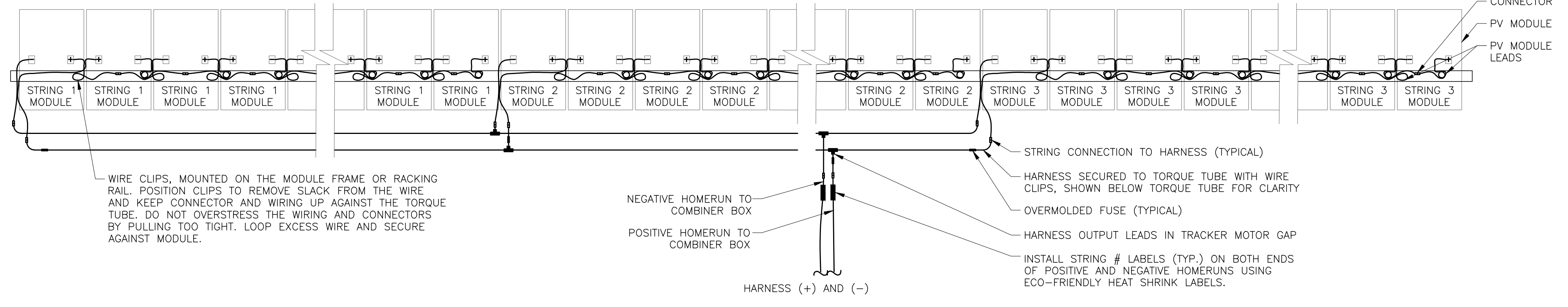


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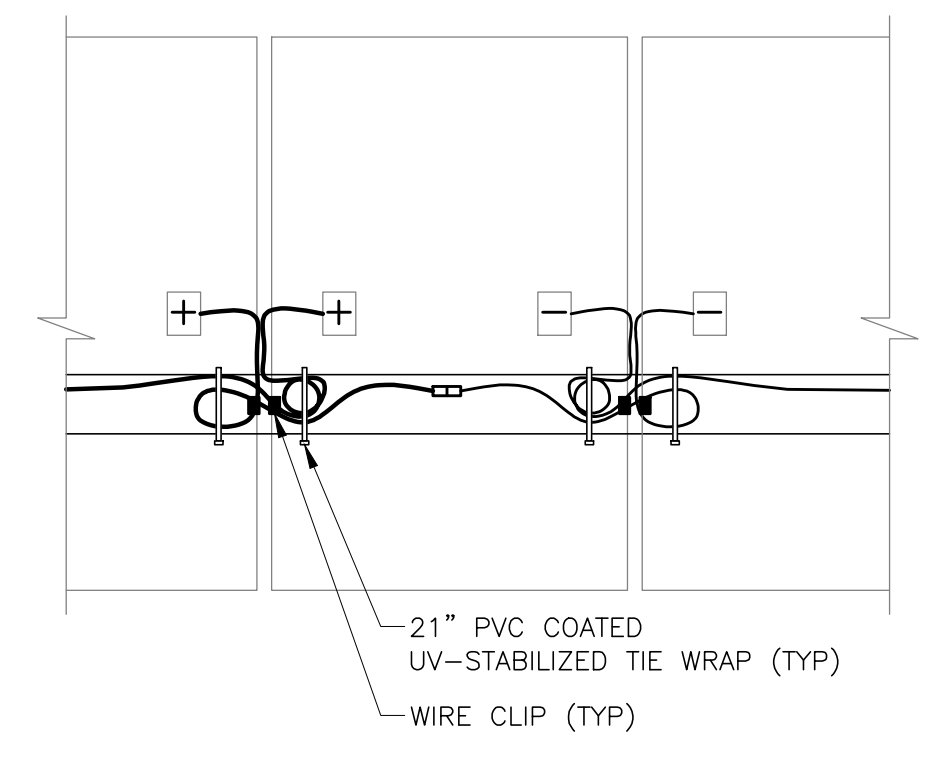
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A	01/12/24	ISSUED FOR REVIEW	SDD	DS	DS																																																													

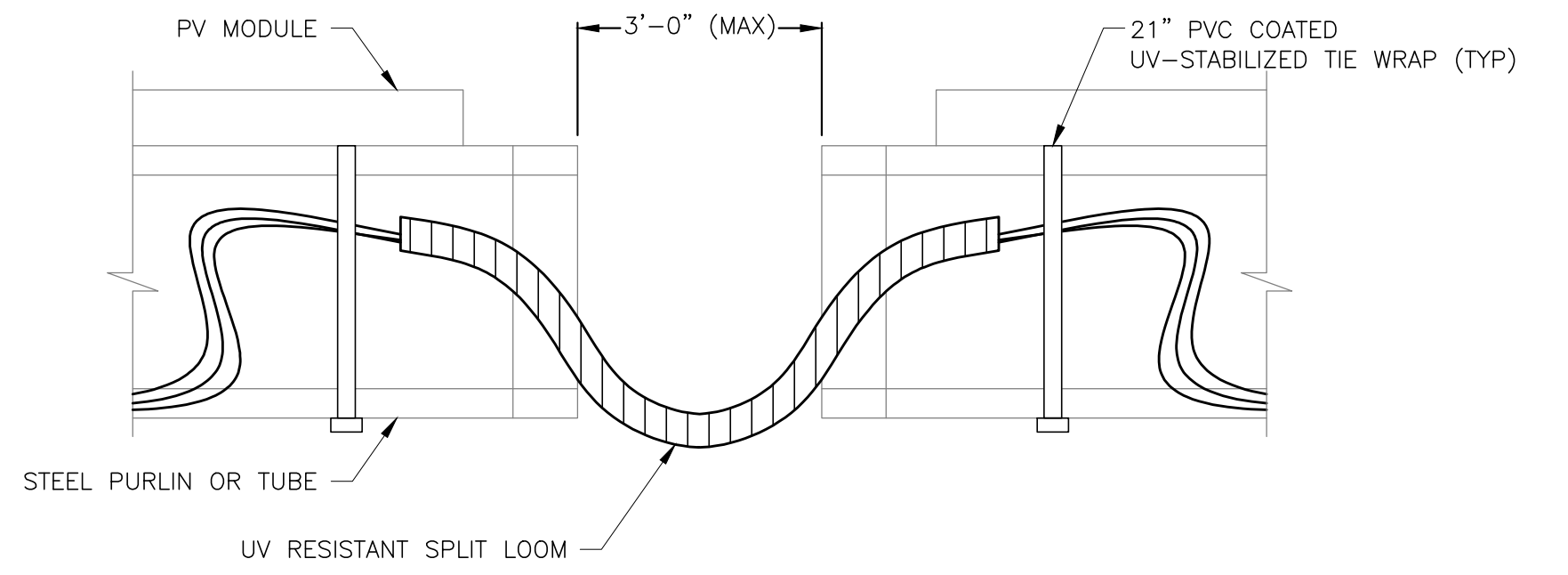


1 TRACKER STRING WIRING DIAGRAM - 3 STRING  
SCALE: NONE

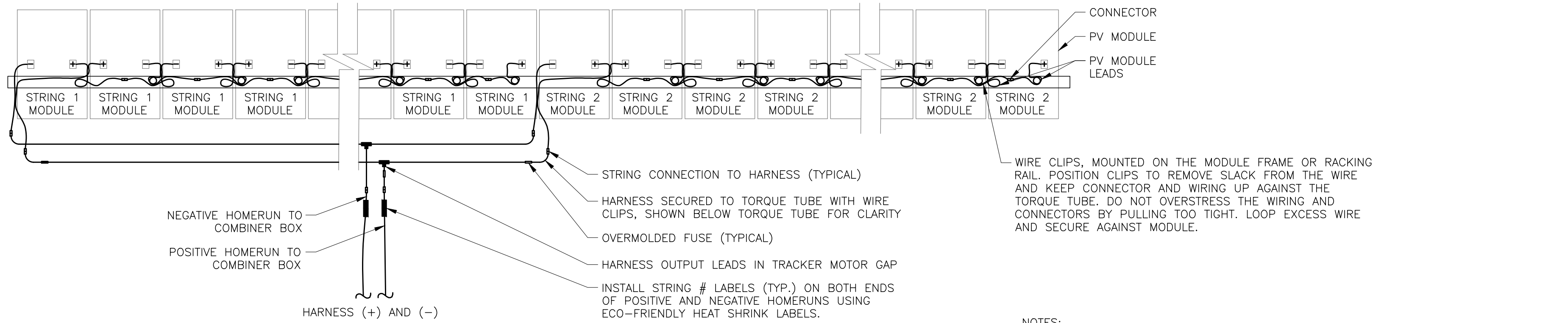
- NOTES:
1. ALL EXPOSED PV WIRE AND ALL CONDUCTORS TRANSITIONING BETWEEN TABLES SHALL BE PROPERLY SECURED AND PROTECTED WITH UL LISTED UV RESISTANT SPLIT LOOM OR SPIRAL WRAP.
  2. SECURE CONDUCTORS WITH STAINLESS STEEL WIRE CLIPS.
  3. CONTRACTOR TO VERIFY MODULE LEADS ARE LONG ENOUGH FOR SKIP-STRINGING.
  4. SOURCE CIRCUIT CONDUCTORS SHALL BE TRANSITIONED TO THE CAB SUCH THAT THERE IS NO TENSION THROUGHOUT THE TRACKER'S COMPLETE RANGE OF MOTION.
  5. CONTRACTOR SHALL ENSURE THAT MODULE CONNECTION TYPES AND JUMPER CONNECTION TYPES ARE COMPATIBLE (MADE BY THE SAME MANUFACTURER).
  6. PV WIRE LEAVING TRACKER MUST NOT TOUCH OR COME CLOSE TO MESSENGER WIRE IN TRANSITION FROM TRACKER TO CAB.
  7. MODULE WIRE MANAGEMENT SHALL BE DONE IN A WAY TO MINIMIZE THE REAR SHADING ON BACK OF BIFACIAL MODULES. COORDINATE IN FIELD 8 PROVIDE SUFFICIENT SLACK BETWEEN CABLE ATTACHMENT POINTS TO AVOID OVERSTRESSING WIRES.



3 STRING WIRING MANAGEMENT  
SCALE: NONE

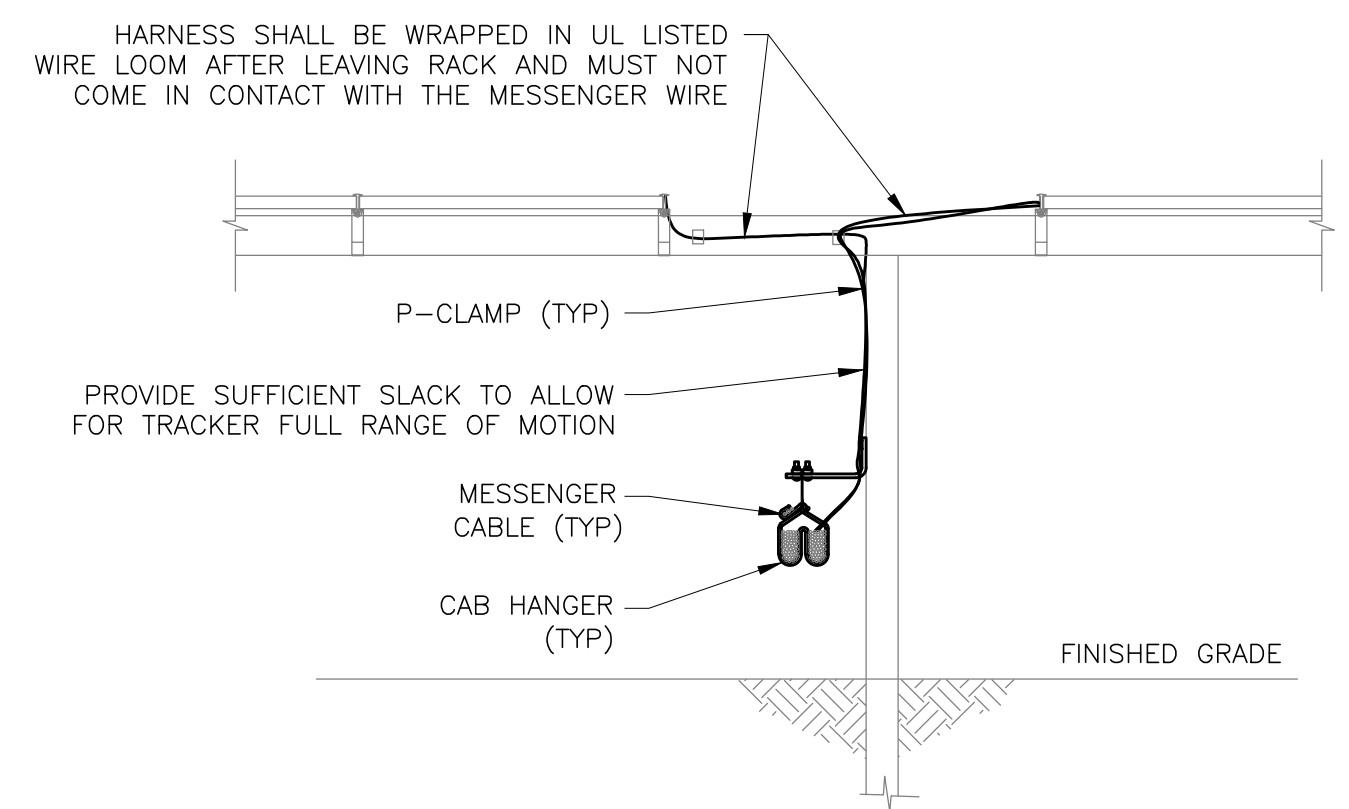


4 STRING WIRING BRIDGE  
SCALE: NONE



2 TRACKER STRING WIRING DIAGRAM - 2 STRING  
SCALE: NONE

- NOTES:
1. ALL EXPOSED PV WIRE AND ALL CONDUCTORS TRANSITIONING BETWEEN TABLES SHALL BE PROPERLY SECURED AND PROTECTED WITH UL LISTED UV RESISTANT SPLIT LOOM OR SPIRAL WRAP.
  2. SECURE CONDUCTORS WITH STAINLESS STEEL WIRE CLIPS.
  3. CONTRACTOR TO VERIFY MODULE LEADS ARE LONG ENOUGH FOR SKIP-STRINGING.
  4. SOURCE CIRCUIT CONDUCTORS SHALL BE TRANSITIONED TO THE CAB SUCH THAT THERE IS NO TENSION THROUGHOUT THE TRACKER'S COMPLETE RANGE OF MOTION.
  5. CONTRACTOR SHALL ENSURE THAT MODULE CONNECTION TYPES AND JUMPER CONNECTION TYPES ARE COMPATIBLE (MADE BY THE SAME MANUFACTURER).
  6. PV WIRE LEAVING TRACKER MUST NOT TOUCH OR COME CLOSE TO MESSENGER WIRE IN TRANSITION FROM TRACKER TO CAB.
  7. MODULE WIRE MANAGEMENT SHALL BE DONE IN A WAY TO MINIMIZE THE REAR SHADING ON BACK OF BIFACIAL MODULES. COORDINATE IN FIELD 8 PROVIDE SUFFICIENT SLACK BETWEEN CABLE ATTACHMENT POINTS TO AVOID OVERSTRESSING WIRES.



5 STRING WIRING TRANSITION  
SCALE: NONE

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DRAWING  
NOT FOR  
CONSTRUCTION

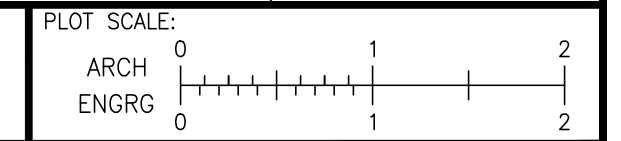
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REV.	DATE	DESCRIPTIONS	BY	CHK'D	APR'D	REV.	DATE	DESCRIPTIONS	BY	CHK'D	APR'D
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						C	10/24/24	ISSUED FOR REVIEW	SDD	MRC	BRB
						B	02/22/24	ISSUED FOR REVIEW	SDD	MRC	BRB
						A	01/12/24	ISSUED FOR REVIEW	SDD	MRC	BRB



NORTH SENECA SOLAR PROJECT  
SAVION  
115/34.5kV SUBSTATION  
DC STRINGING DETAILS

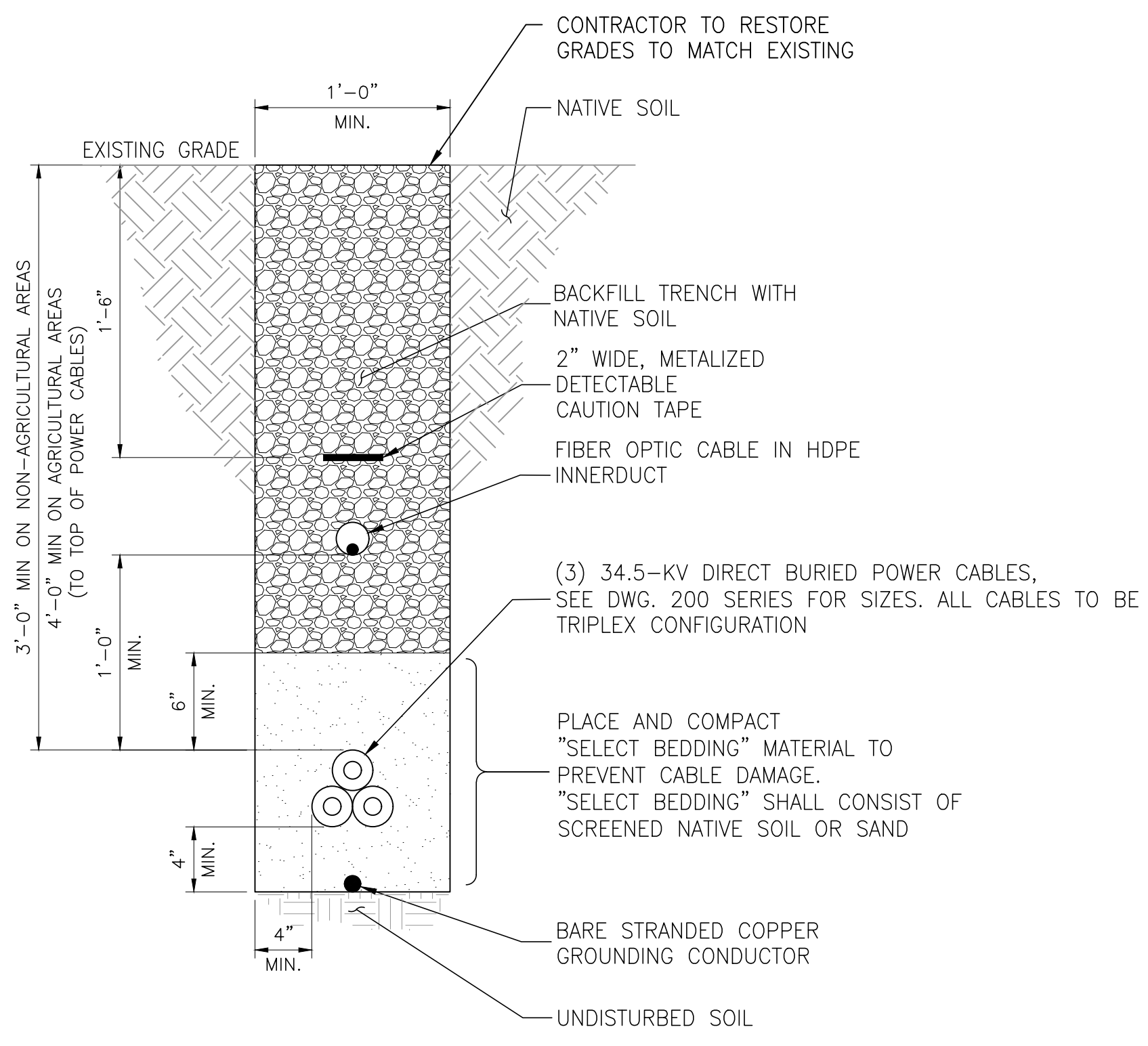
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DWG. NO.:	301	SHEET:	01
		REV.:	D



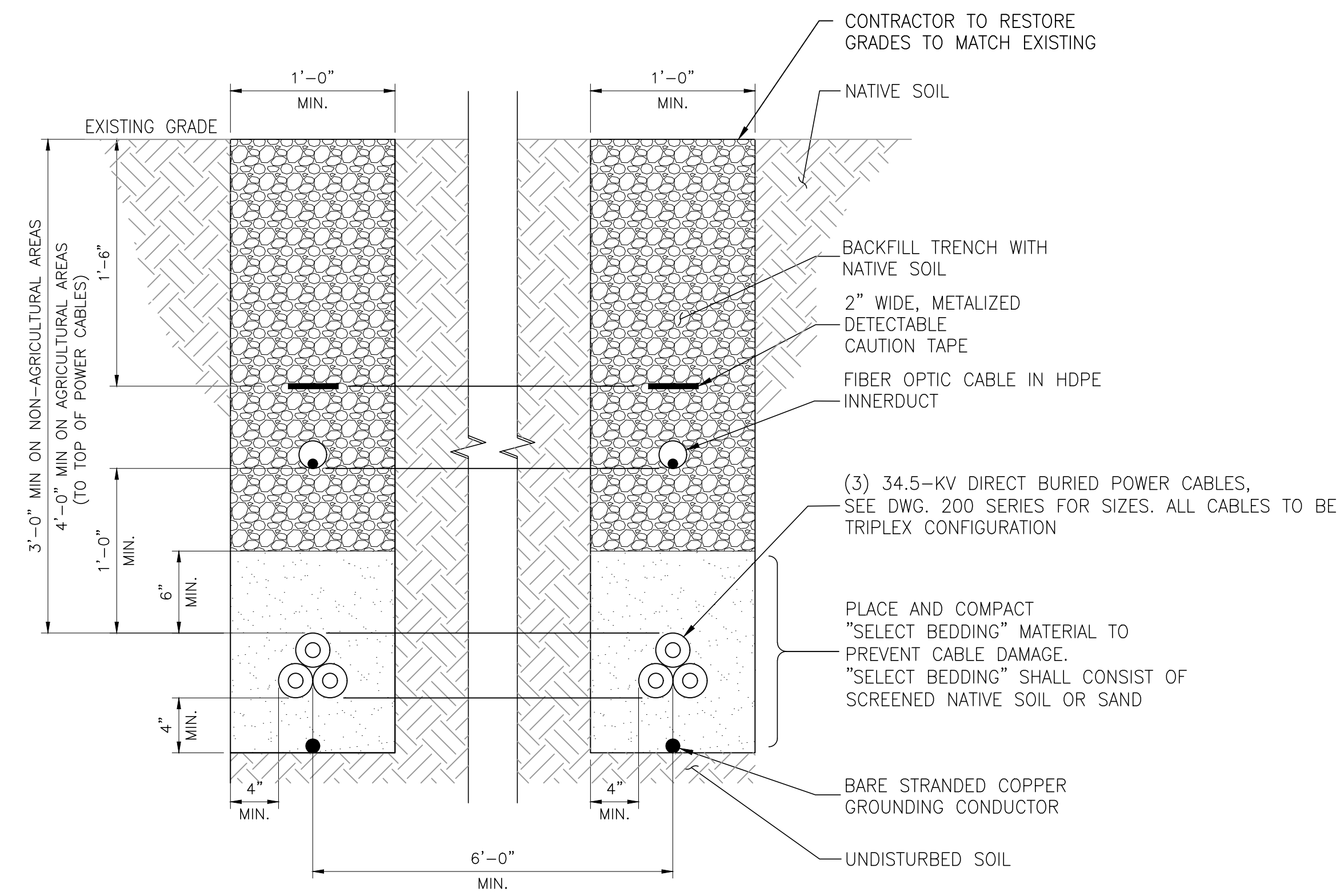


A B C D E F G H I J

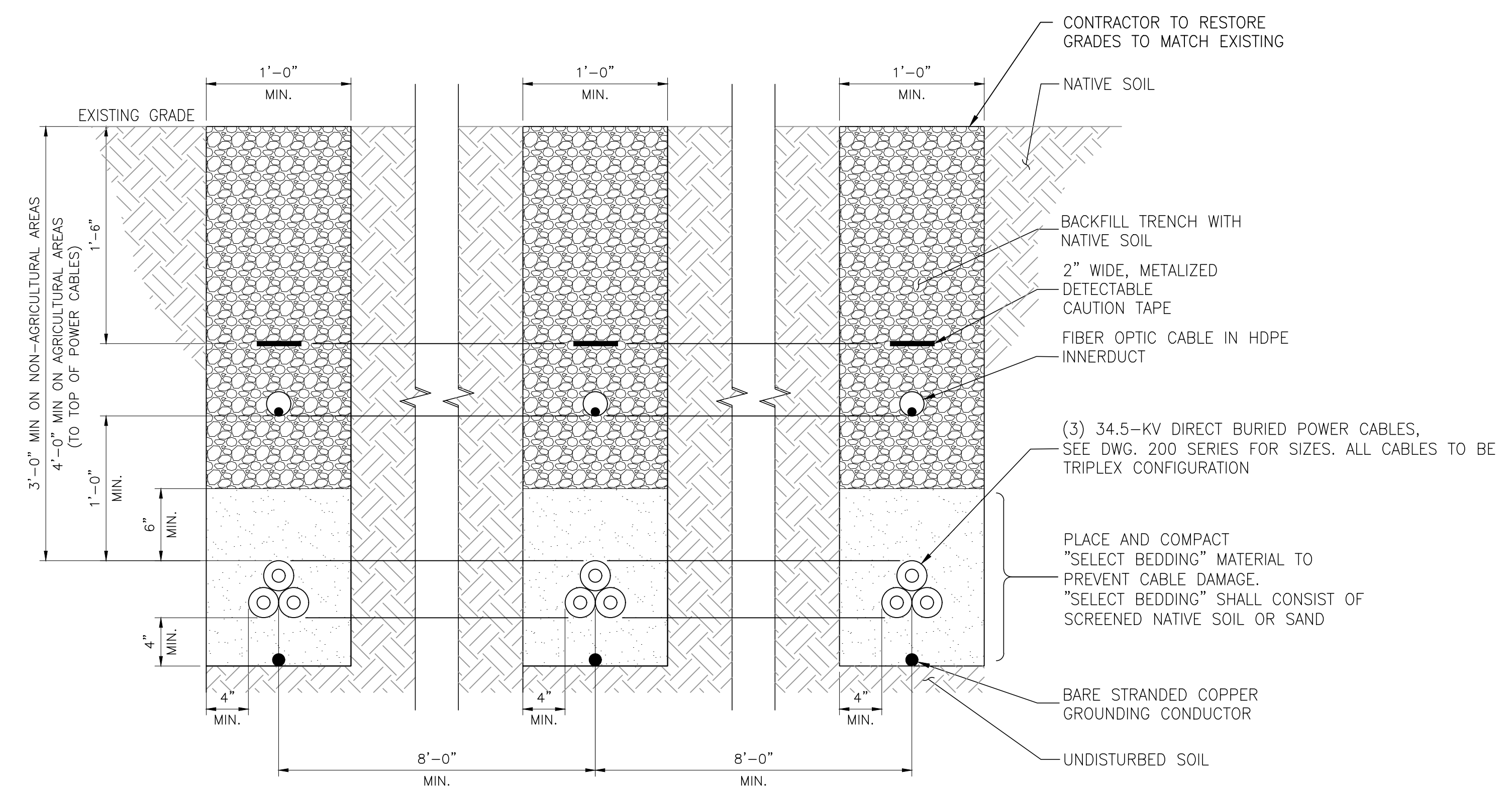
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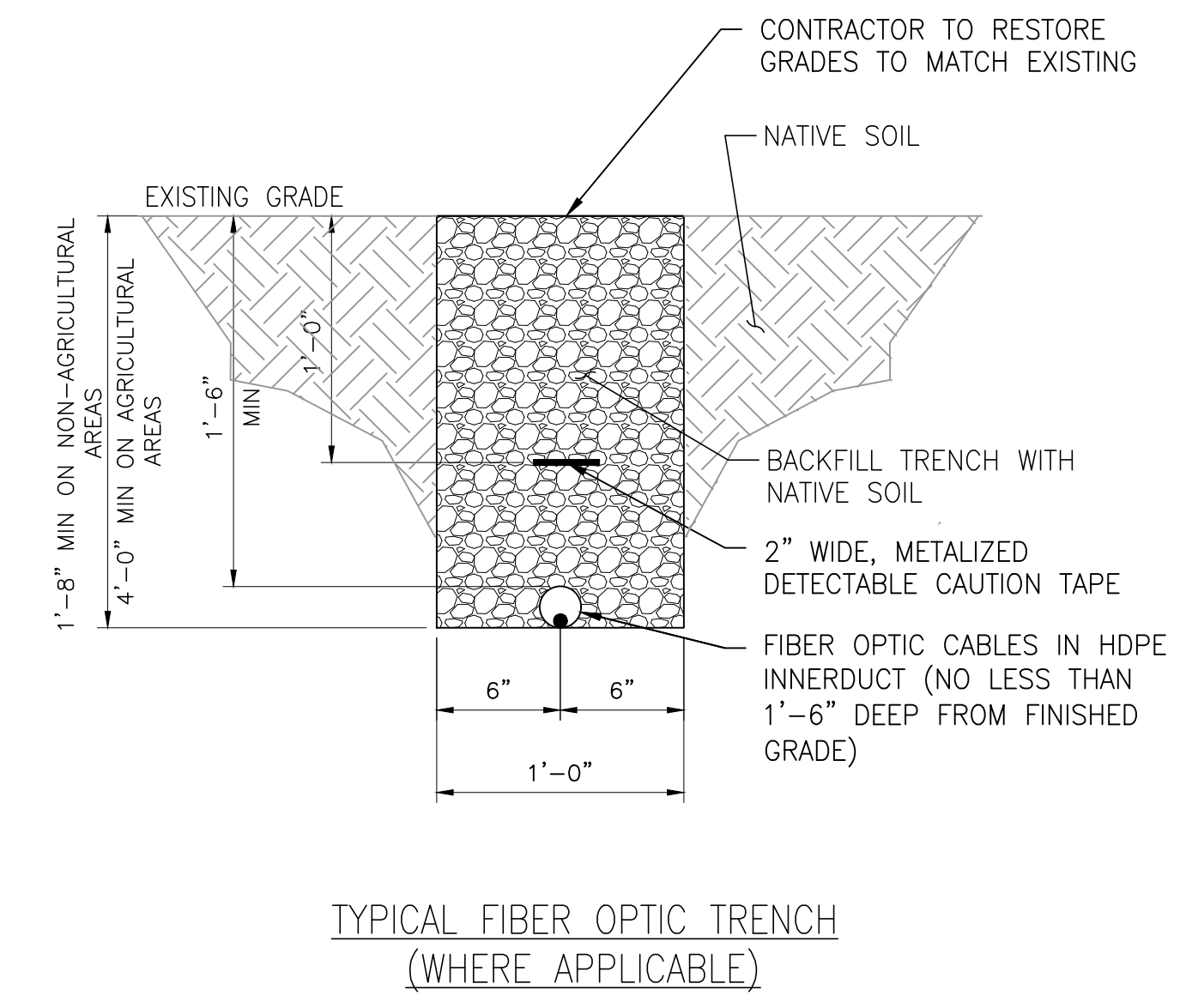
TYPICAL SINGLE CIRCUIT 34.5kV DIRECT BURIED CABLE TRENCH



TYPICAL DOUBLE CIRCUIT 34.5kV DIRECT BURIED CABLE TRENCH



TYPICAL TRIPLE CIRCUIT 34.5kV DIRECT BURIED CABLE TRENCH



TYPICAL FIBER OPTIC TRENCH (WHERE APPLICABLE)

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						B	02/22/24	ISSUED FOR REVIEW	SDD	DS	DS
						A	01/12/24	ISSUED FOR REVIEW	SDD	DS	DS



NORTH SENECA SOLAR PROJECT  
SAVION  
34.5kV COLLECTION SYSTEM  
TYPICAL TRENCH DETAILS

PROJ. NO.:	19349	SCALE:	1-1/2"=1'-0"
DWG. NO.:	501	SHEET:	01
REV.:		REV.:	D

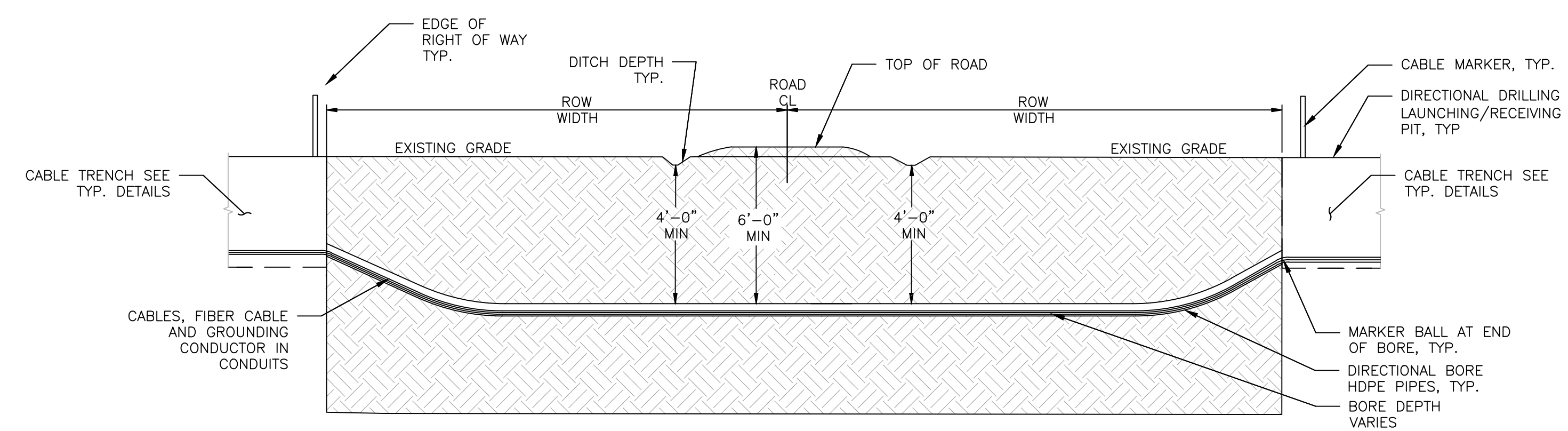
A B C D E F G H I J

A | B | C | D | E | F | G | H | I | J

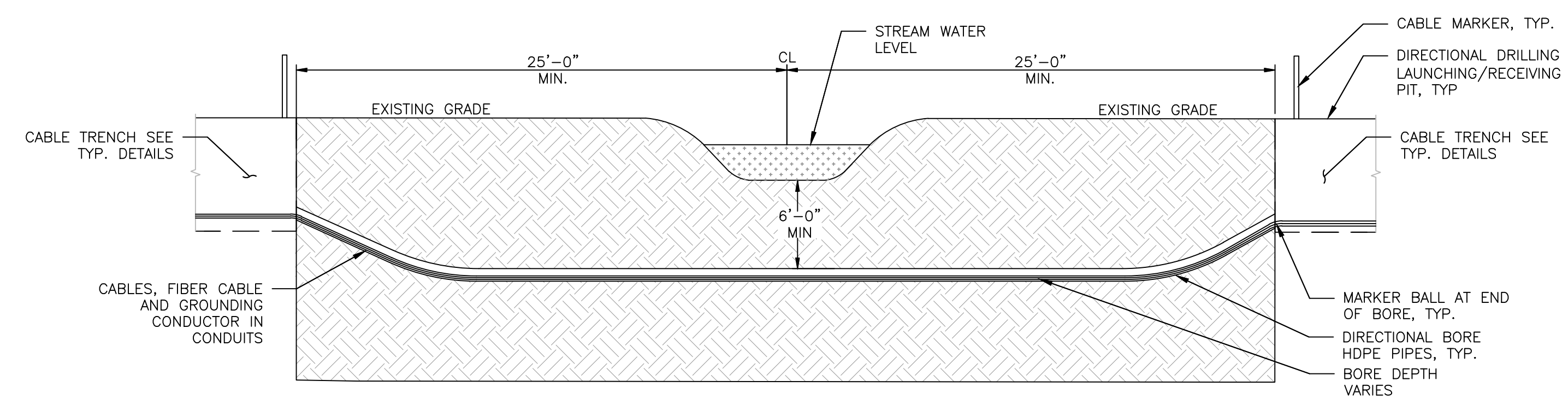
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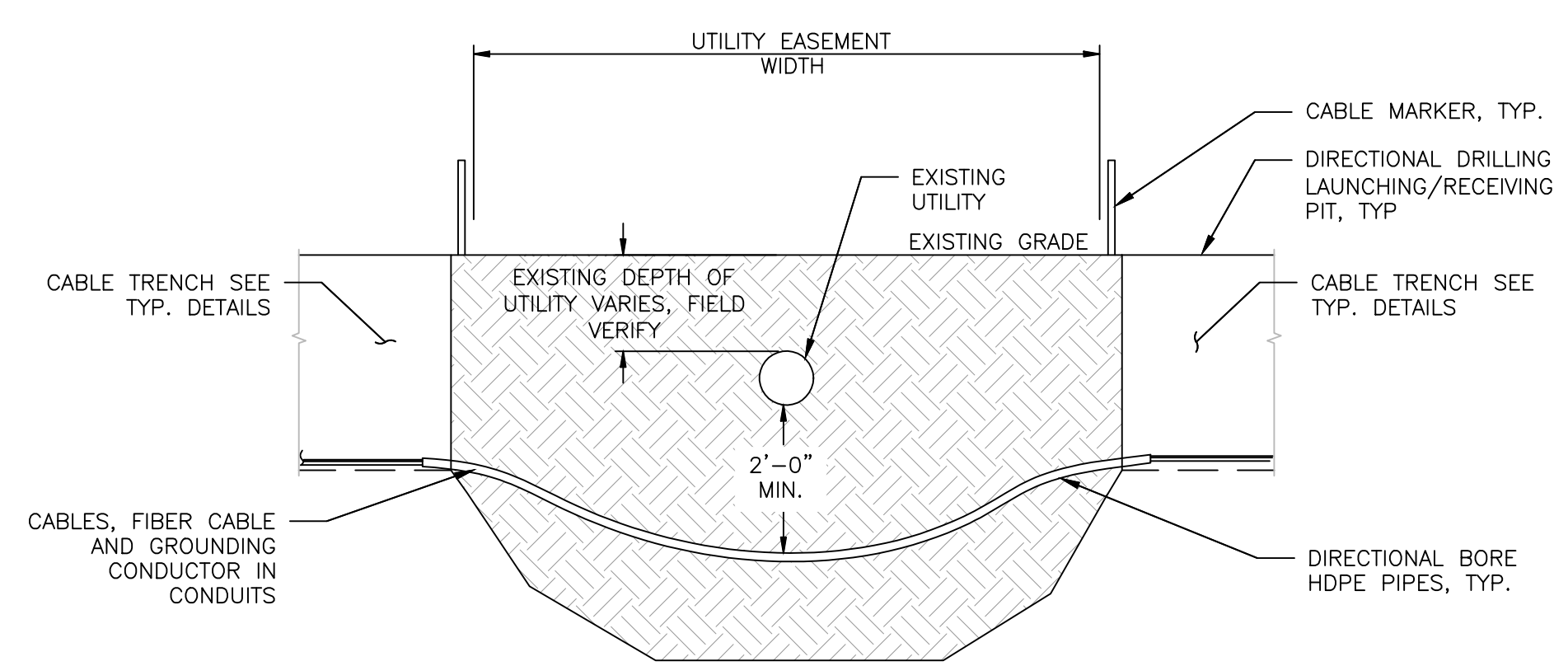
- GENERAL NOTES:**
- CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, AND PROCEDURES. CONTRACTOR SHALL PROVIDE TEMPORARY ERECTION BRACING AND SHORING AS REQUIRED DURING ERECTION OF ALL STRUCTURAL FRAMING AND DURING EXCAVATION, COMPLYING WITH ALL OSHA REGULATIONS. EXCAVATION, TRENCHING, AND SHORING SHALL BE PER OSHA REGULATIONS, 29 CFR CH. XVII, STANDARD 1926, SUBPART "P".
  - CONTRACTOR SHALL LIMIT HIS OPERATION ON AND ADJACENT TO THE SITE AS REQUIRED BY THE OWNER.
  - SITE ACCESS: UNCONTROLLED OR UNRESTRICTED ACCESS FOR MATERIALS, DEBRIS OR EQUIPMENT WILL NOT BE PERMITTED. ACCESS ROUTES SHALL BE SUBJECT TO APPROVAL BY THE OWNER.
  - PROVIDE ALL PROTECTION BARRICADES, ETC., REQUIRED BY FEDERAL, STATE, COUNTY, OR MUNICIPAL LAWS AND ORDINANCES; MAINTAIN ALL LIGHTS, SIGNALS, AND PROTECTION OF ALL KINDS FOR THE FULL PERIOD OF OPERATIONS; AND REMOVE THE SAME WHEN DIRECTED.
  - CONTRACTOR SHALL RESTORE ALL AREAS DAMAGED DURING CONSTRUCTION TO ORIGINAL CONDITION INCLUDING CLEAN-UP, REGRADING, SEEDING, AND SIDEWALK / PAVEMENT REPLACEMENT.
  - TEMPORARY AND PERMANENT SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE UTILIZED TO PREVENT EROSION OF EXCAVATED MATERIALS TO ADJOINING AREAS, PRIOR TO START OF CONSTRUCTION. PROVIDE TEMPORARY SITE DRAINAGE DURING CONSTRUCTION TO AVOID FLOODING OF THE SITE. ALSO, PROVIDE A STABILIZED CONSTRUCTION ENTRANCE OR MEANS TO PREVENT SOIL TRACKING TO PUBLIC ROADS DURING CONSTRUCTION.
  - SEE DRAWINGS 100 SERIES FOR CABLE, FIBER OPTIC AND GROUNDING CONDUCTOR ROUTING. REFER TO DRAWINGS 200 SERIES FOR CABLE QUANTITIES AND SIZES.
  - MINIMUM BENDING RADIUS OF CABLES RECOMMENDED BY MANUFACTURER SHALL NOT BE EXCEEDED.



TYPICAL ROAD BORE CROSSING



TYPICAL WETLAND/STREAM BORE CROSSING



TYPICAL UTILITY CROSSING

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DRAWING  
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CONSTRUCTION

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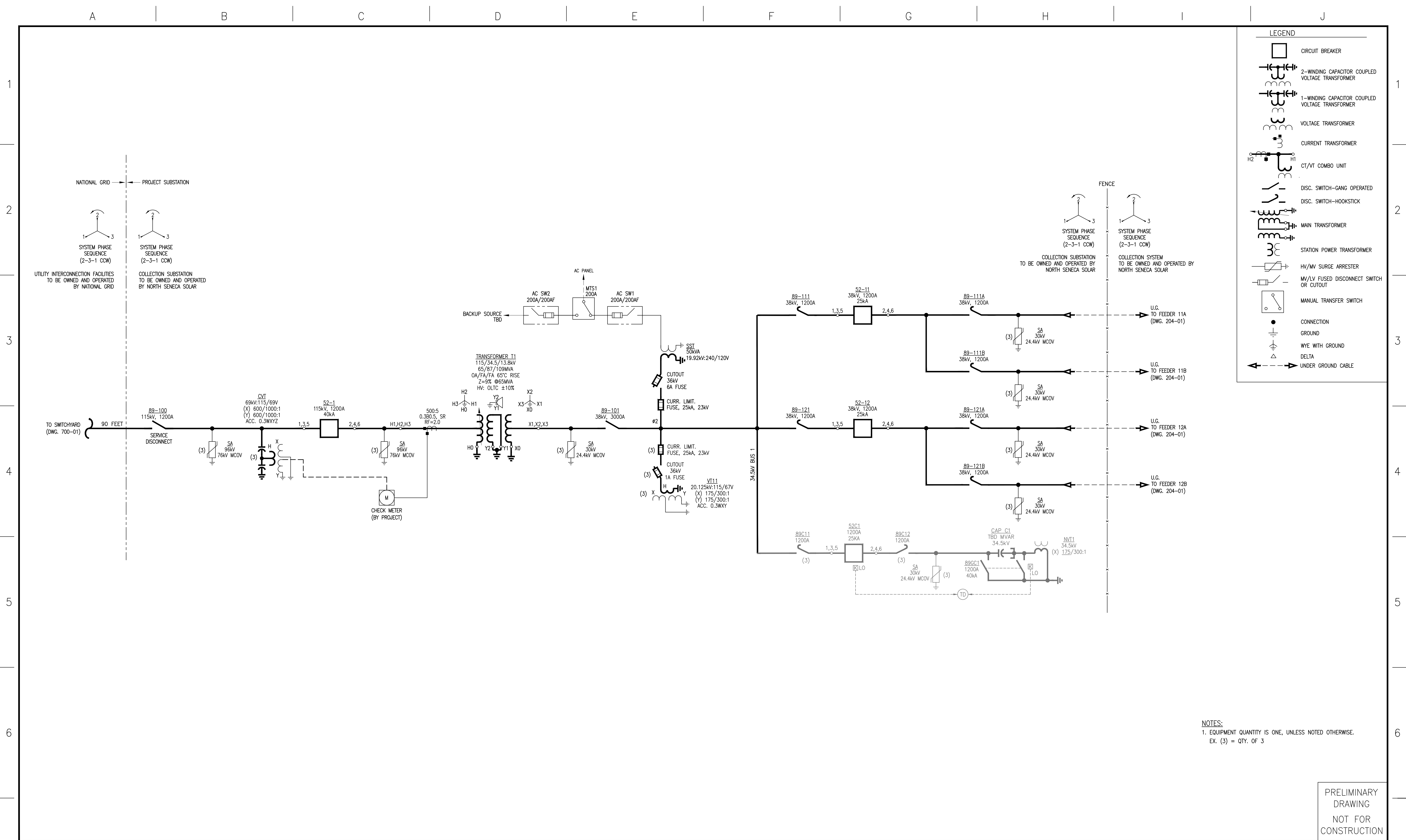
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C	10/24/24	ISSUED FOR REVIEW							SDD	DS	DS
B	02/22/24	ISSUED FOR REVIEW							SDD	DS	DS
A	01/12/24	ISSUED FOR REVIEW							SDD	DS	DS



**NORTH SENECA SOLAR PROJECT  
SAVION**  
34.5kV COLLECTION SYSTEM  
UNDERGROUND COLLECTION SYSTEM  
CROSSING DETAILS

PROJ. NO.:	19349	SCALE:	NONE
DWG. NO.:	502	SHEET:	01
REV.:		REV.:	D

A | B | C | D | E | F | G | H | I | J



**LEGEND**

- CIRCUIT BREAKER
- 2-WINDING CAPACITOR COUPLED VOLTAGE TRANSFORMER
- 1-WINDING CAPACITOR COUPLED VOLTAGE TRANSFORMER
- VOLTAGE TRANSFORMER
- CURRENT TRANSFORMER
- CT/VT COMBO UNIT
- DISC. SWITCH-GANG OPERATED
- DISC. SWITCH-HOOKSTICK
- MAIN TRANSFORMER
- STATION POWER TRANSFORMER
- HV/MV SURGE ARRESTER
- MV/LV FUSED DISCONNECT SWITCH OR CUTOUT
- MANUAL TRANSFER SWITCH
- CONNECTION
- GROUND
- WYE WITH GROUND
- DELTA
- UNDER GROUND CABLE

**NOTES:**  
 1. EQUIPMENT QUANTITY IS ONE, UNLESS NOTED OTHERWISE.  
 EX. (3) = QTY. OF 3

PRELIMINARY  
 DRAWING  
 NOT FOR  
 CONSTRUCTION

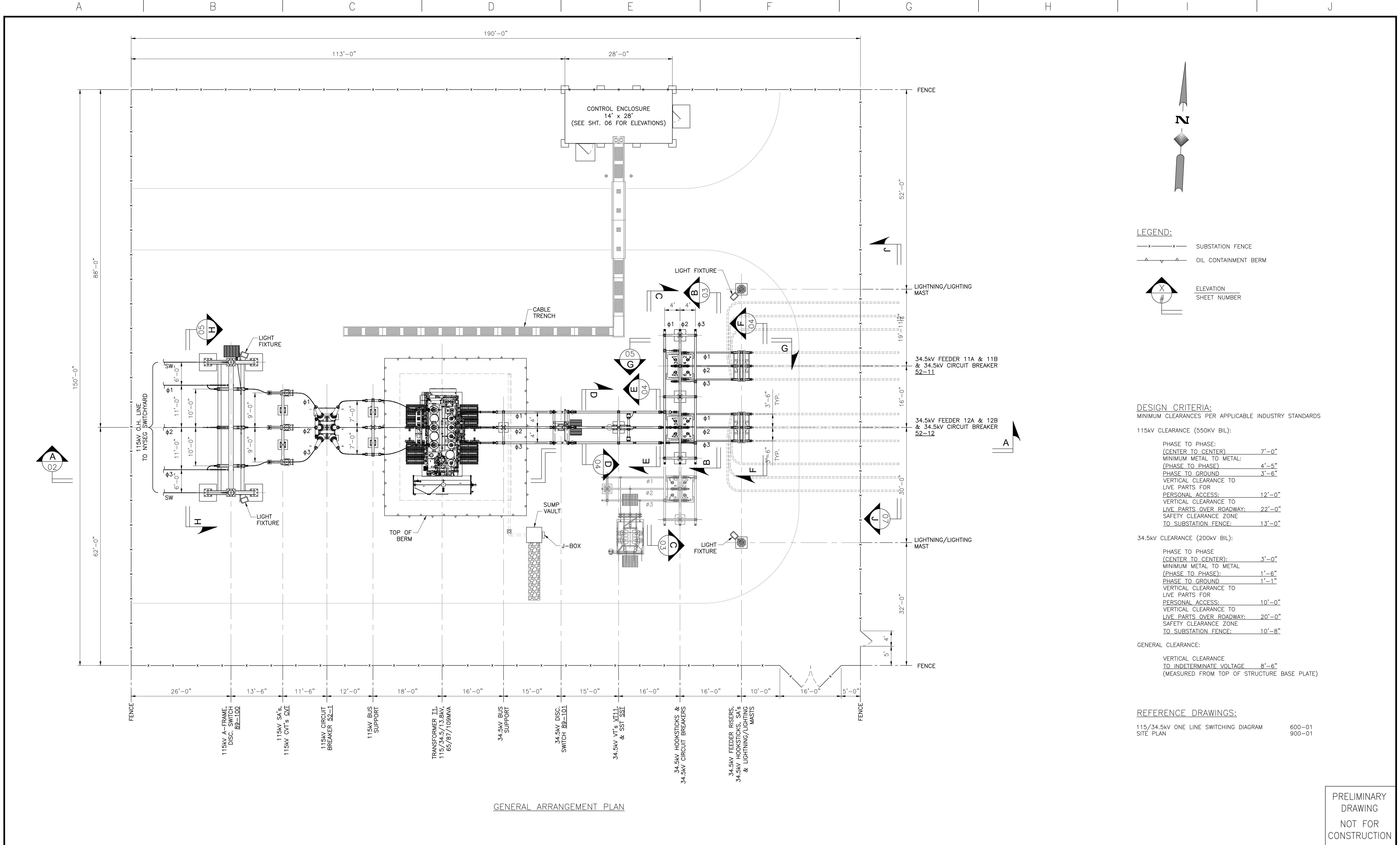
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						B	02/22/24	ISSUED FOR REVIEW	TT	BC	MS
						A	01/12/24	ISSUED FOR REVIEW	TT	BC	MS



**NORTH SENECA SOLAR PROJECT**  
 SAVION  
 115/34.5kV SUBSTATION  
 ONE LINE  
 SWITCHING DIAGRAM

PLOT SCALE:	ARCH	ENGRG	SCALE:	NONE
PROJ. NO.:	19349	SHEET:	01	REV.:
DWG. NO.:	600			D



**LEGEND:**

—x—x— SUBSTATION FENCE

—▲—▲— OIL CONTAINMENT BERM

⊗ # ELEVATION SHEET NUMBER

**DESIGN CRITERIA:**  
 MINIMUM CLEARANCES PER APPLICABLE INDUSTRY STANDARDS

**115kV CLEARANCE (550kV BIL):**

PHASE TO PHASE:  
 (CENTER TO CENTER) 7'-0"  
 MINIMUM METAL TO METAL: 4'-5"  
 (PHASE TO PHASE) 4'-5"  
 PHASE TO GROUND 3'-6"  
 VERTICAL CLEARANCE TO LIVE PARTS FOR PERSONAL ACCESS: 12'-0"  
 VERTICAL CLEARANCE TO LIVE PARTS OVER ROADWAY: 22'-0"  
 SAFETY CLEARANCE ZONE TO SUBSTATION FENCE: 13'-0"

**34.5kV CLEARANCE (200kV BIL):**

PHASE TO PHASE (CENTER TO CENTER): 3'-0"  
 MINIMUM METAL TO METAL (PHASE TO PHASE): 1'-6"  
 PHASE TO GROUND 1'-1"  
 VERTICAL CLEARANCE TO LIVE PARTS FOR PERSONAL ACCESS: 10'-0"  
 VERTICAL CLEARANCE TO LIVE PARTS OVER ROADWAY: 20'-0"  
 SAFETY CLEARANCE ZONE TO SUBSTATION FENCE: 10'-8"

**GENERAL CLEARANCE:**

VERTICAL CLEARANCE TO INDETERMINATE VOLTAGE 8'-6"  
 (MEASURED FROM TOP OF STRUCTURE BASE PLATE)

**REFERENCE DRAWINGS:**

115/34.5kV ONE LINE SWITCHING DIAGRAM 600-01  
 SITE PLAN 900-01

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 DRAWING  
 NOT FOR  
 CONSTRUCTION

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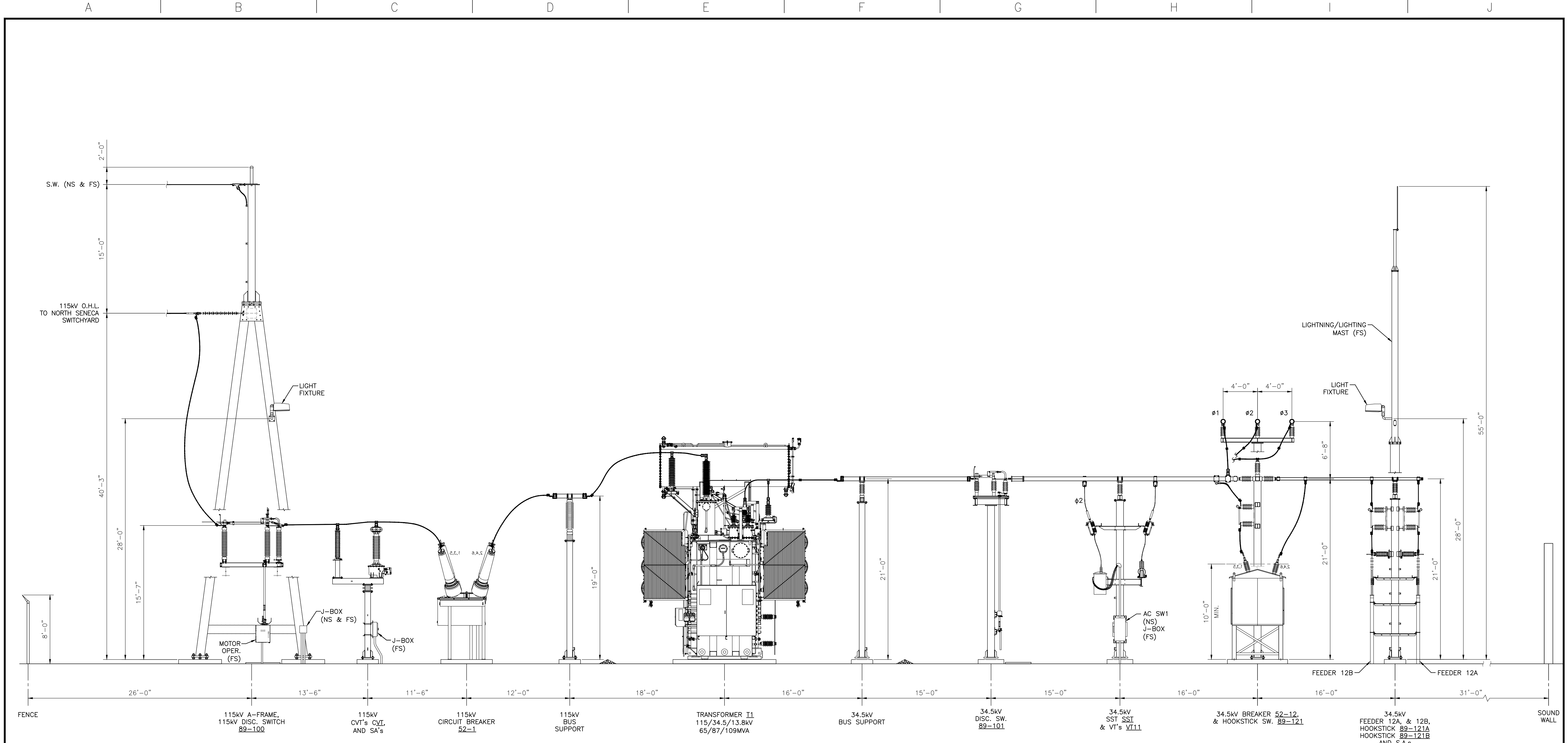
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B	01/12/24	ISSUED FOR REVIEW	SDD	MRC	BRB						
A	11/17/23	ISSUED FOR REVIEW	SDD	MRC	BRB						
E	11/01/24	ISSUED FOR REVIEW	SDD	MRC	BRB						



NORTH SENECA SOLAR PROJECT  
 SAVION

115/34.5kV SUBSTATION  
 GENERAL ARRANGEMENT PLAN  
 PLAN VIEW

PROJ. NO.:	19349	SCALE:	3/32"=1'-0"
DWG. NO.:	601	SHEET:	01
REV.:		REV.:	E



ELEVATION A-A

PRELIMINARY  
DRAWING  
NOT FOR  
CONSTRUCTION

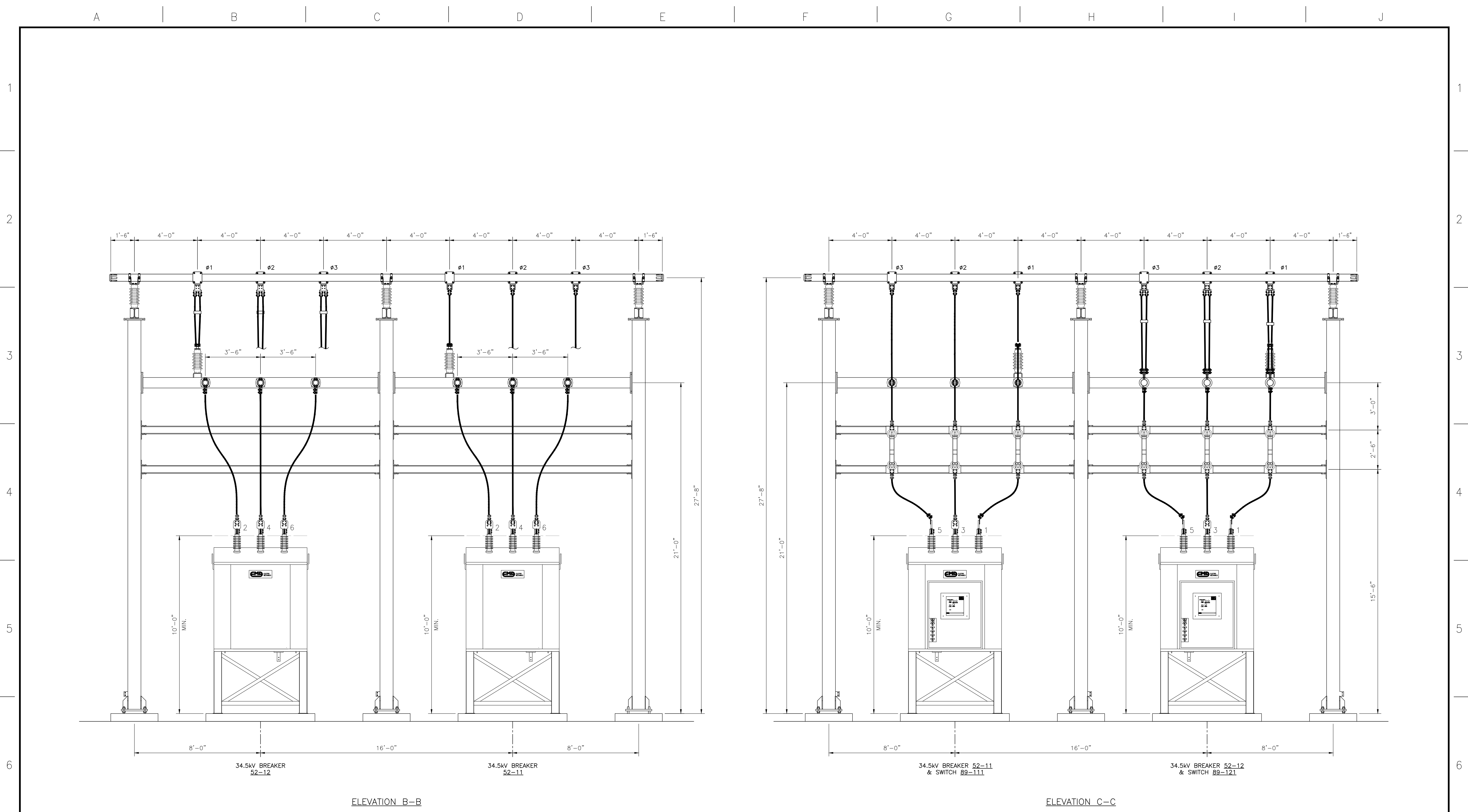
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E	11/01/24	ISSUED FOR REVIEW	SDD	MRC	BRB	A	11/17/23	ISSUED FOR REVIEW	SDD	MRC	BRB



NORTH SENECA SOLAR PROJECT  
SAVION  
115/34.5kV SUBSTATION  
GENERAL ARRANGEMENT PLAN  
ELEVATION VIEW

PROJ. NO.:	19349	SCALE:	3/16"=1'-0"
DWG. NO.:	601	SHEET:	02
REV.:		REV.:	E



ELEVATION B-B

ELEVATION C-C

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CONSTRUCTION

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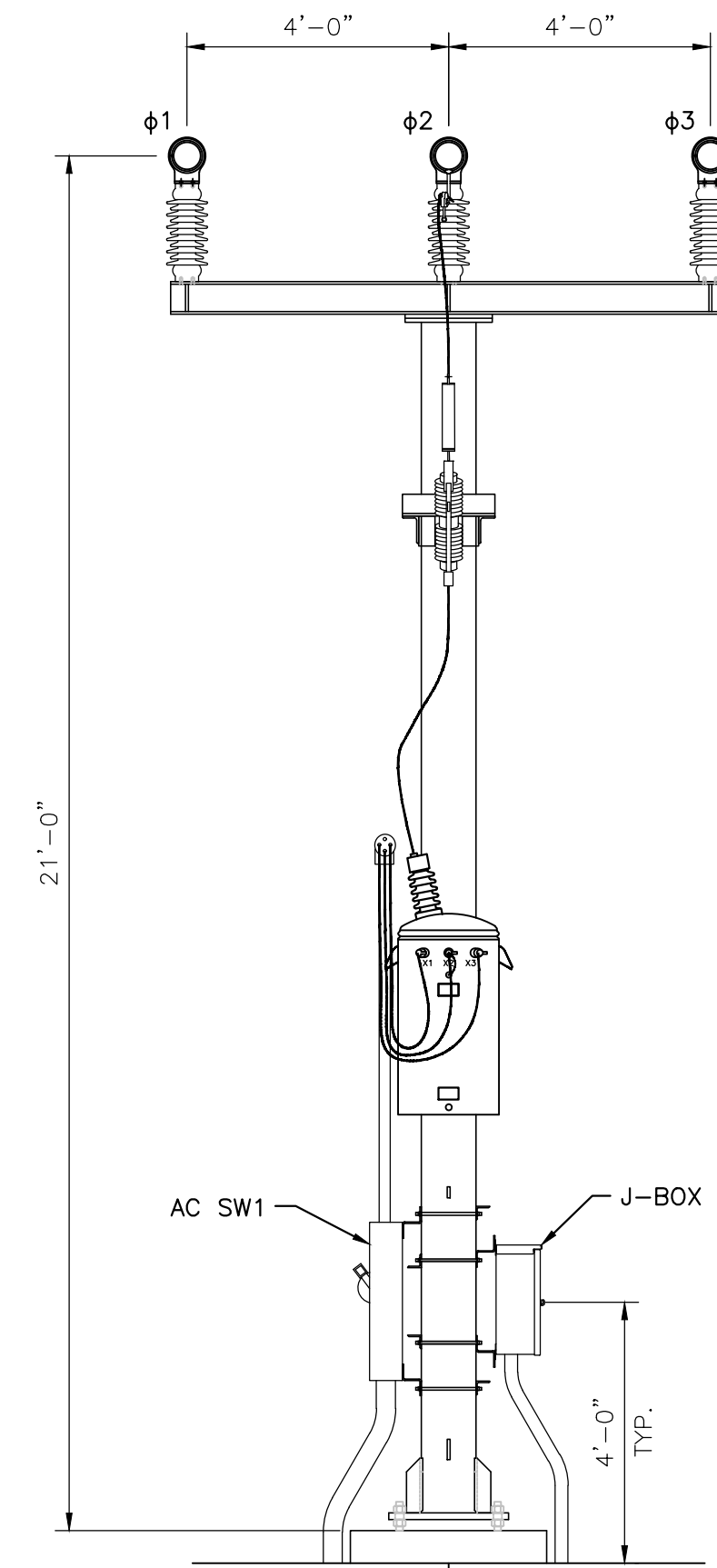
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E	11/01/24	ISSUED FOR REVIEW	SDD	MRC	BRB	A	11/17/23	ISSUED FOR REVIEW	SDD	MRC	BRB



NORTH SENECA SOLAR PROJECT  
 SAVION  
 115/34.5kV SUBSTATION  
 GENERAL ARRANGEMENT PLAN  
 ELEVATION VIEWS

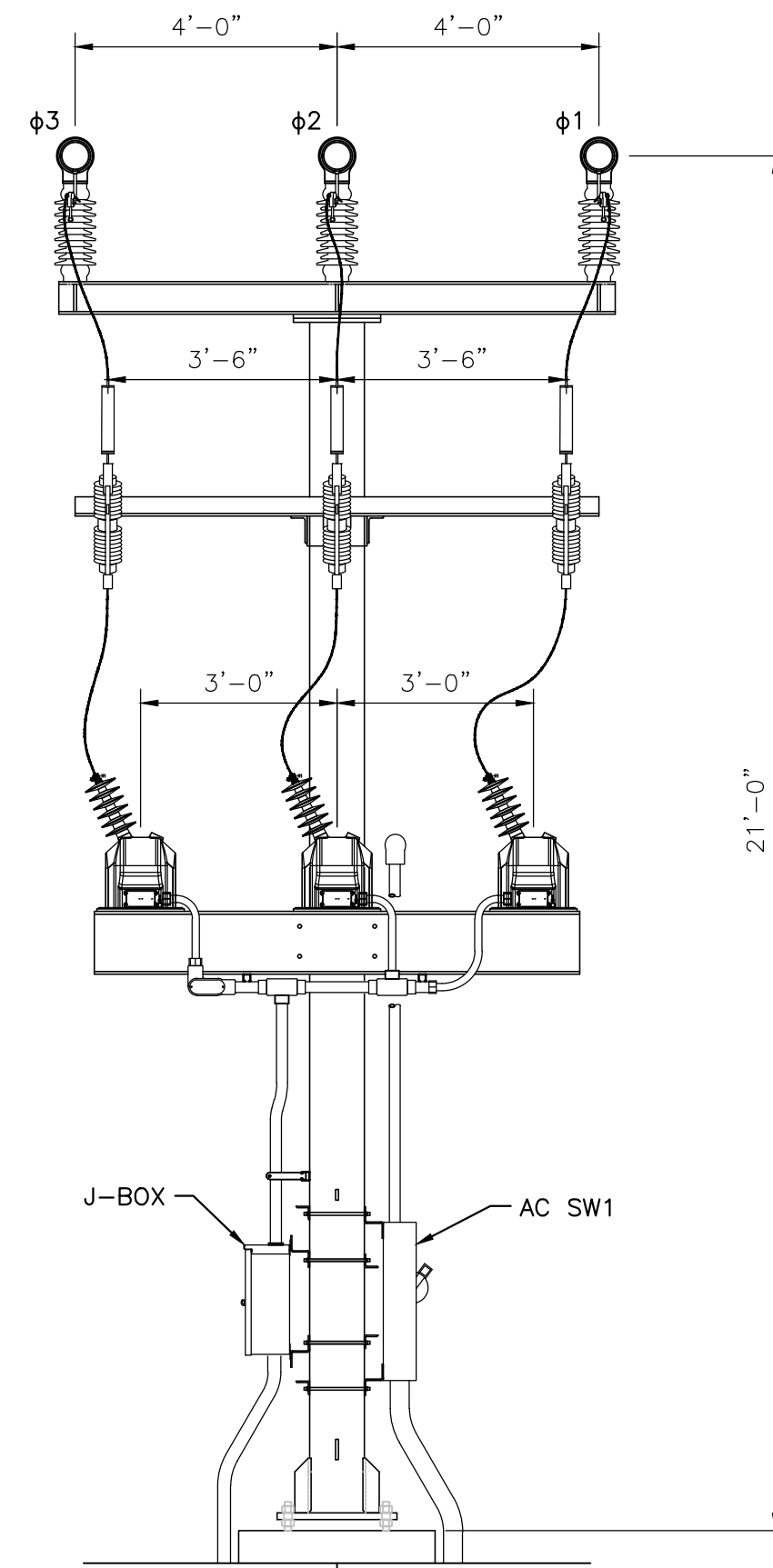
PLOT SCALE: ARCH ENGRG 0 1 2 1" = 1'-0"	PROJ. NO.: 19349 DWG. NO.: 601	SCALE: 3/8" = 1'-0" SHEET: 03 REV.: E
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A | B | C | D | E | F | G | H | I | J



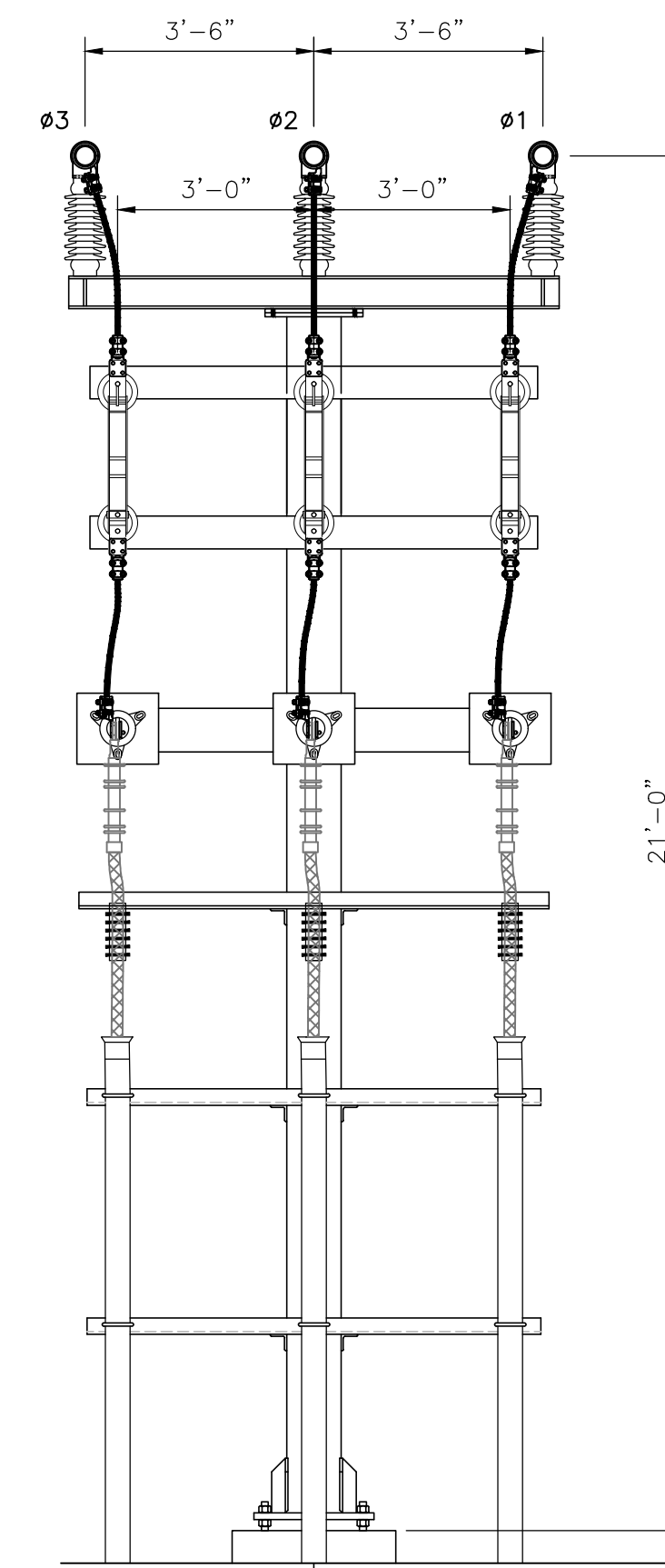
34.5kV STATION SERVICE  
TRANSFORMER SSI,  
CUTOUT, & CURRENT  
LIMITING FUSE

ELEVATION D-D



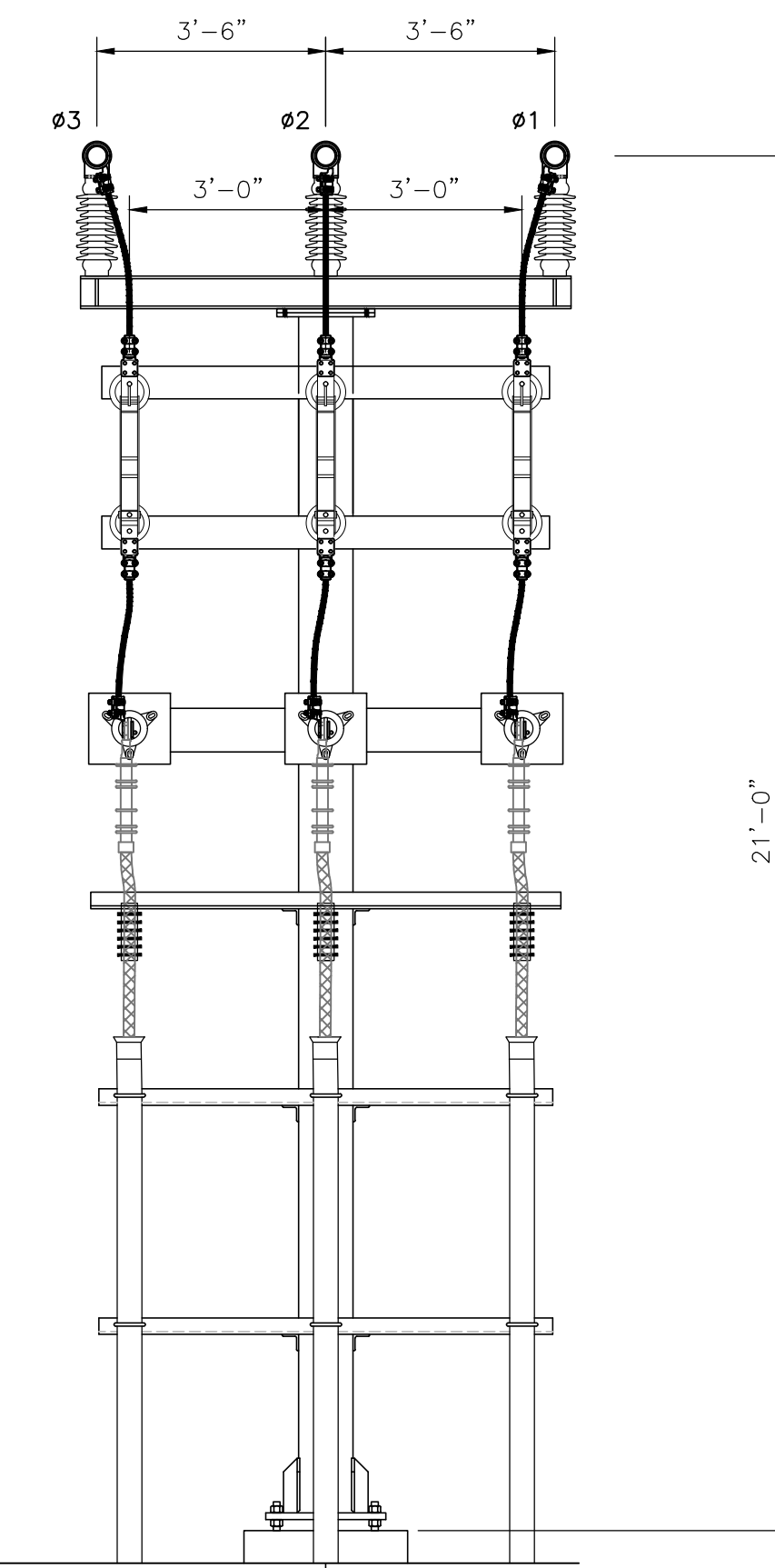
34.5kV VT's VT11,  
CUTOUT, & CURRENT  
LIMITING FUSES

ELEVATION E-E



34.5kV FEEDER 12A,  
SURGE ARRESTERS &  
HOOKSTICK SW. 89-121A

ELEVATION F-F



34.5kV FEEDER 11A,  
SURGE ARRESTERS &  
HOOKSTICK SW. 89-111A

ELEVATION F-F

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NOT FOR  
CONSTRUCTION

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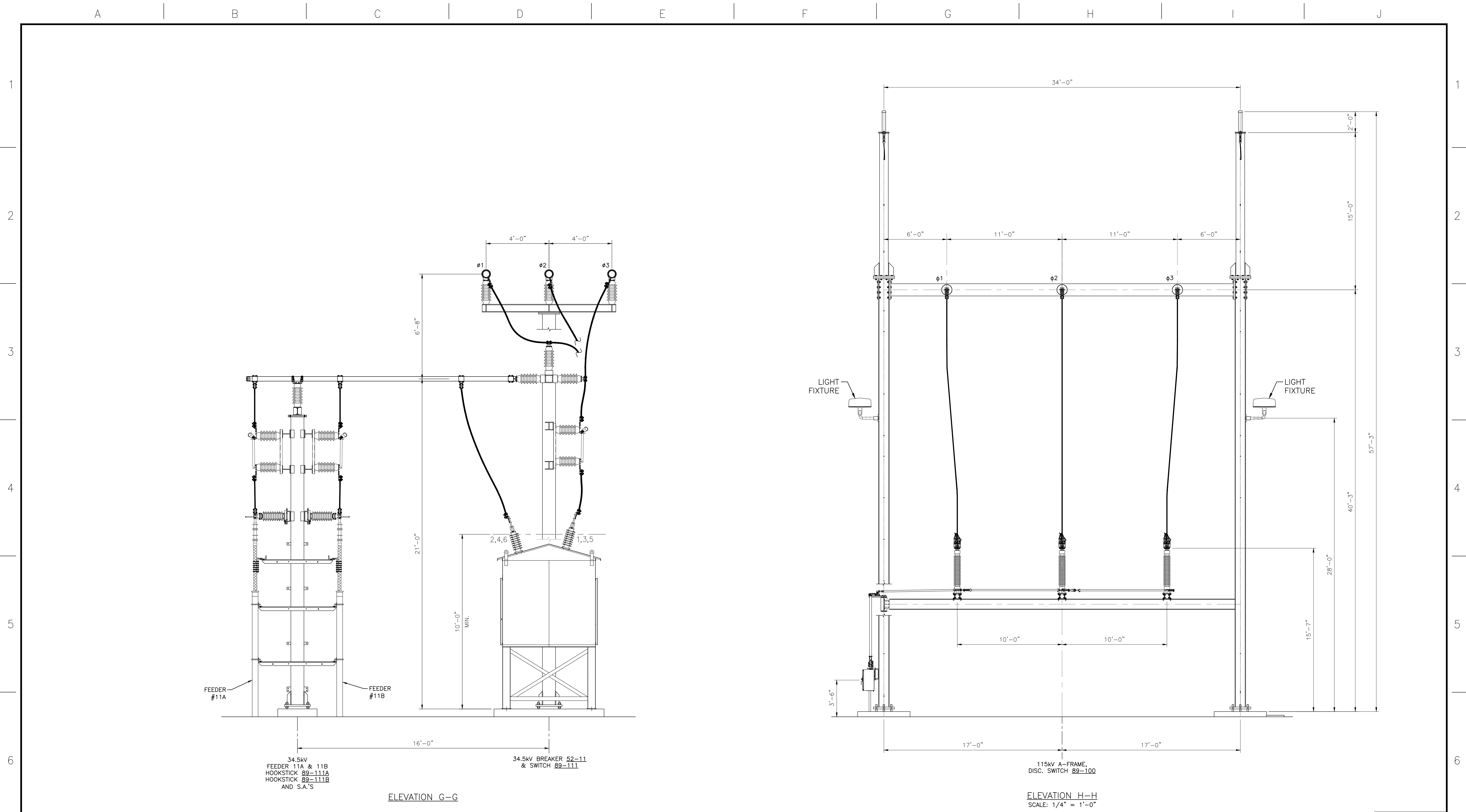
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						B	01/12/24	ISSUED FOR REVIEW	SDD	MRC	BRB
E	11/01/24	ISSUED FOR REVIEW	SDD	MRC	BRB	A	11/17/23	ISSUED FOR REVIEW	SDD	MRC	BRB



NORTH SENECA SOLAR PROJECT  
SAVION  
115/34.5kV SUBSTATION  
GENERAL ARRANGEMENT PLAN  
ELEVATION VIEWS

PROJ. NO.: 19349	SCALE: 3/8"=1'-0"
DWG. NO.: 601	SHEET: 04
	REV.: E

A | B | C | D | E | F | G | H | I | J



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DRAWING  
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CONSTRUCTION

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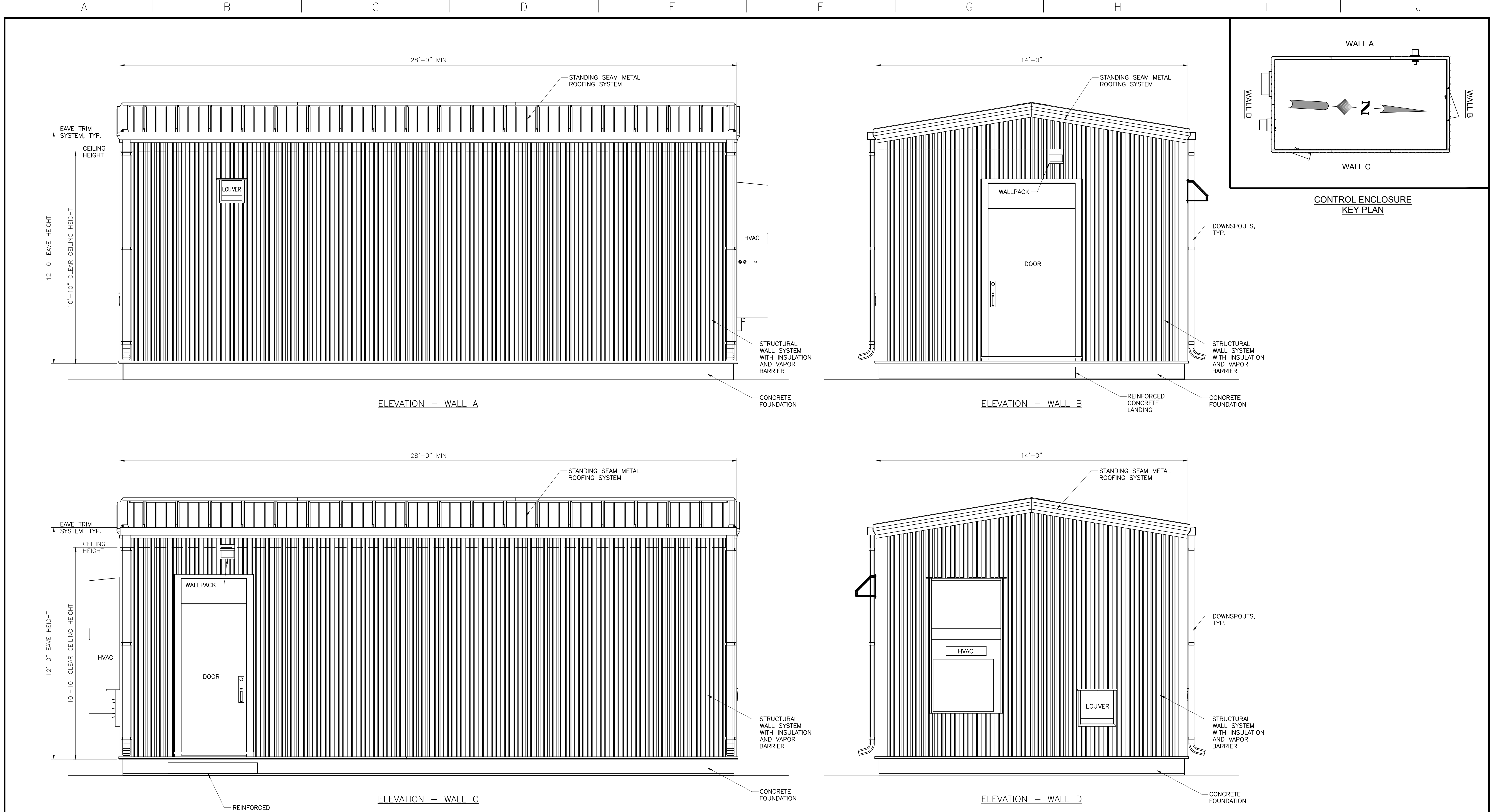
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						B	01/12/24	ISSUED FOR REVIEW	SDD	MRC	BRB
E	11/01/24	ISSUED FOR REVIEW	SDD	MRC	BRB	A	11/17/23	ISSUED FOR REVIEW	SDD	MRC	BRB



NORTH SENECA SOLAR PROJECT  
 SAVION  
 115/34.5kV SUBSTATION  
 GENERAL ARRANGEMENT PLAN  
 ELEVATION VIEWS

PLOT SCALE: ARCH 0 1 2 ENGRG 0 1 2	SCALE: 3/8" = 1'-0" U.N.O.
PROJ. NO.: 19349	SHEET: 05
DWG. NO.: 601	REV.: E





- NOTES:**
- CONTROL ENCLOSURE SHALL BE PRE-ENGINEERED METAL STRUCTURE WITH INTERIOR AND EXTERIOR FINISHES.
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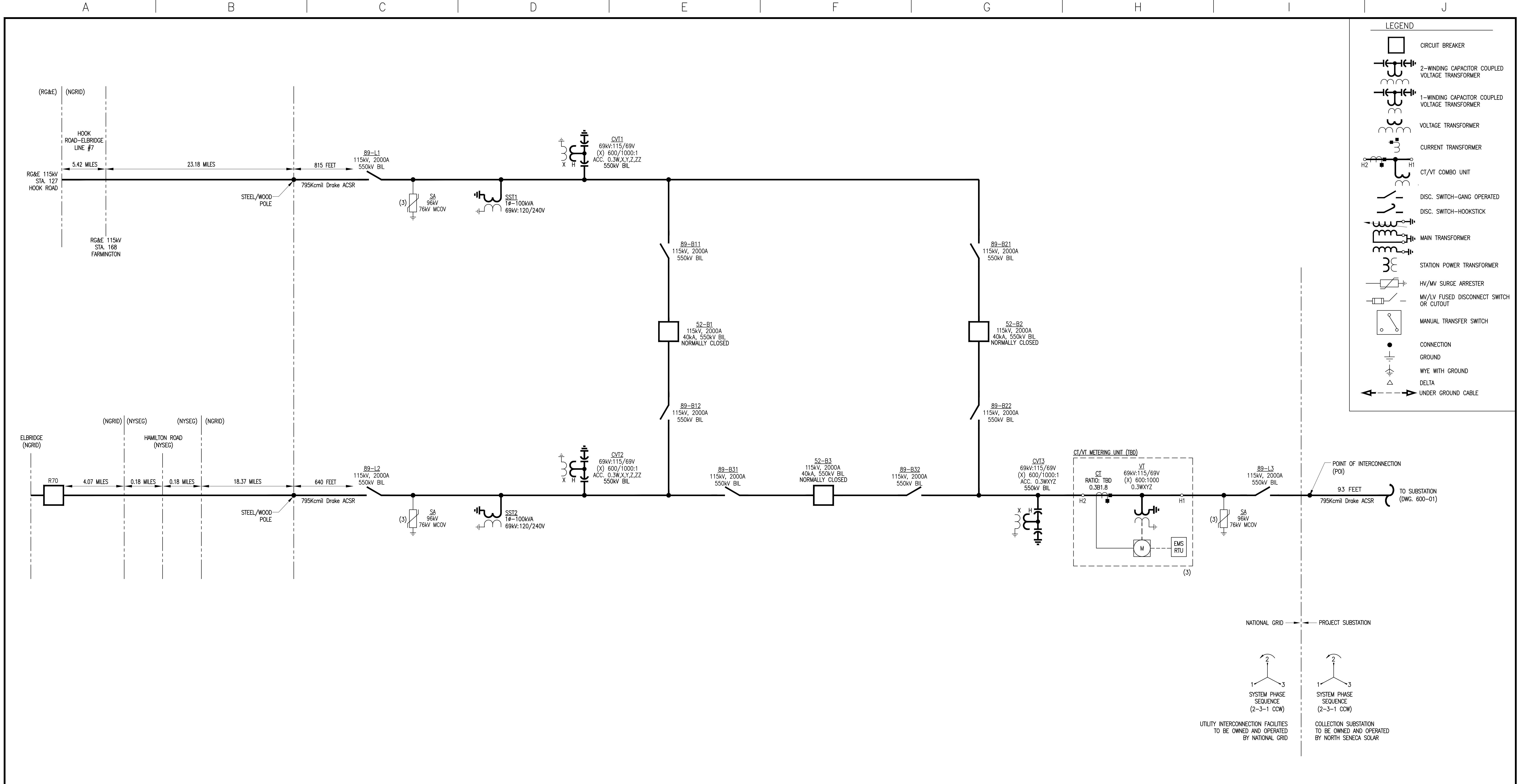
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D	11/01/24	ISSUED FOR REVIEW	SDD	MRC	BRB						
C	10/24/24	ISSUED FOR REVIEW	SDD	MRC	BRB						
B	02/22/24	ISSUED FOR REVIEW	SDD	MRC	BRB						
A	01/12/24	ISSUED FOR REVIEW	SDD	MRC	BRB						



NORTH SENECA SOLAR PROJECT  
SAVION  
115/34.5kV SUBSTATION  
GENERAL ARRANGEMENT PLAN  
ELEVATION VIEWS

PROJ. NO.:	19349	SHEET:	06	REV.:	D
DWG. NO.:	601	SCALE: 1/2" = 1'-0" U.N.O.			
PLOT SCALE:		ARCH ENGRG 0 1 2			



**NOTES:**  
 1. EQUIPMENT QUANTITY IS ONE, UNLESS NOTED OTHERWISE.  
 EX. (3) = QTY. OF 3

PRELIMINARY  
 DRAWING  
 NOT FOR  
 CONSTRUCTION

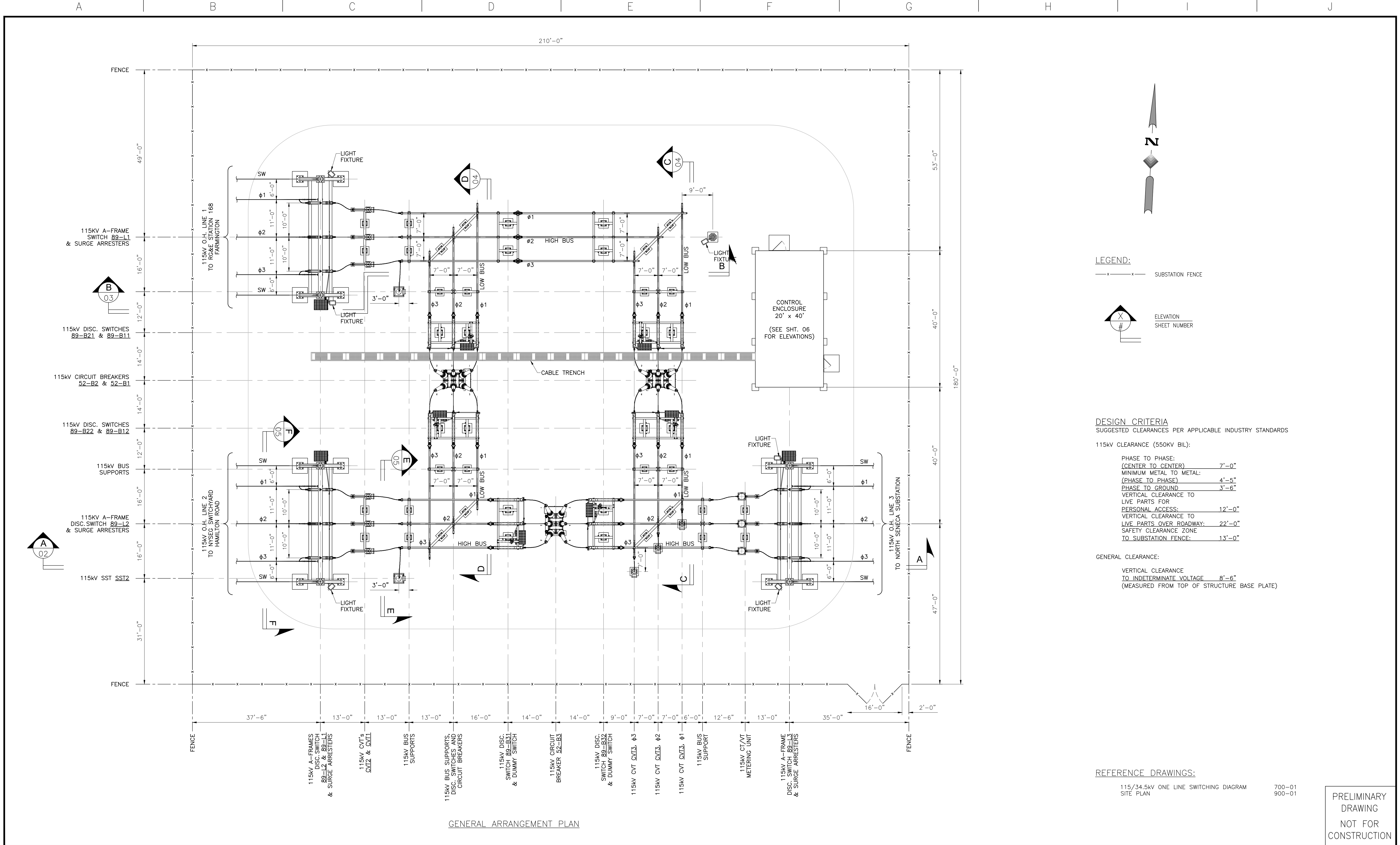
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						C	10/24/24	ISSUED FOR REVIEW	TT	BC	MS
						B	02/22/24	ISSUED FOR REVIEW	TT	BC	MS
						A	01/12/24	ISSUED FOR REVIEW	TT	BC	MS



NORTH SENECA SOLAR PROJECT  
 SAVION  
 115kV SWITCHYARD  
 ONE LINE  
 SWITCHING DIAGRAM

PLT SCALE:	ARCH	ENGRG	0	1	2
PROJ. NO.:	19349	SCALE:	NONE		
DWG. NO.:	700	SHEET:	01	REV.:	D



**LEGEND:**

—x—x— SUBSTATION FENCE

⬆️ X # ELEVATION SHEET NUMBER

**DESIGN CRITERIA**  
SUGGESTED CLEARANCES PER APPLICABLE INDUSTRY STANDARDS

**115kV CLEARANCE (550kV BIL):**

PHASE TO PHASE:  
(CENTER TO CENTER) 7'-0"  
MINIMUM METAL TO METAL:  
(PHASE TO PHASE) 4'-5"  
PHASE TO GROUND 3'-6"  
VERTICAL CLEARANCE TO LIVE PARTS FOR PERSONAL ACCESS: 12'-0"  
VERTICAL CLEARANCE TO LIVE PARTS OVER ROADWAY: 22'-0"  
SAFETY CLEARANCE ZONE TO SUBSTATION FENCE: 13'-0"

**GENERAL CLEARANCE:**

VERTICAL CLEARANCE TO INDETERMINATE VOLTAGE 8'-6"  
(MEASURED FROM TOP OF STRUCTURE BASE PLATE)

**REFERENCE DRAWINGS:**

115/34.5kV ONE LINE SWITCHING DIAGRAM SITE PLAN 700-01 900-01

GENERAL ARRANGEMENT PLAN

PRELIMINARY DRAWING  
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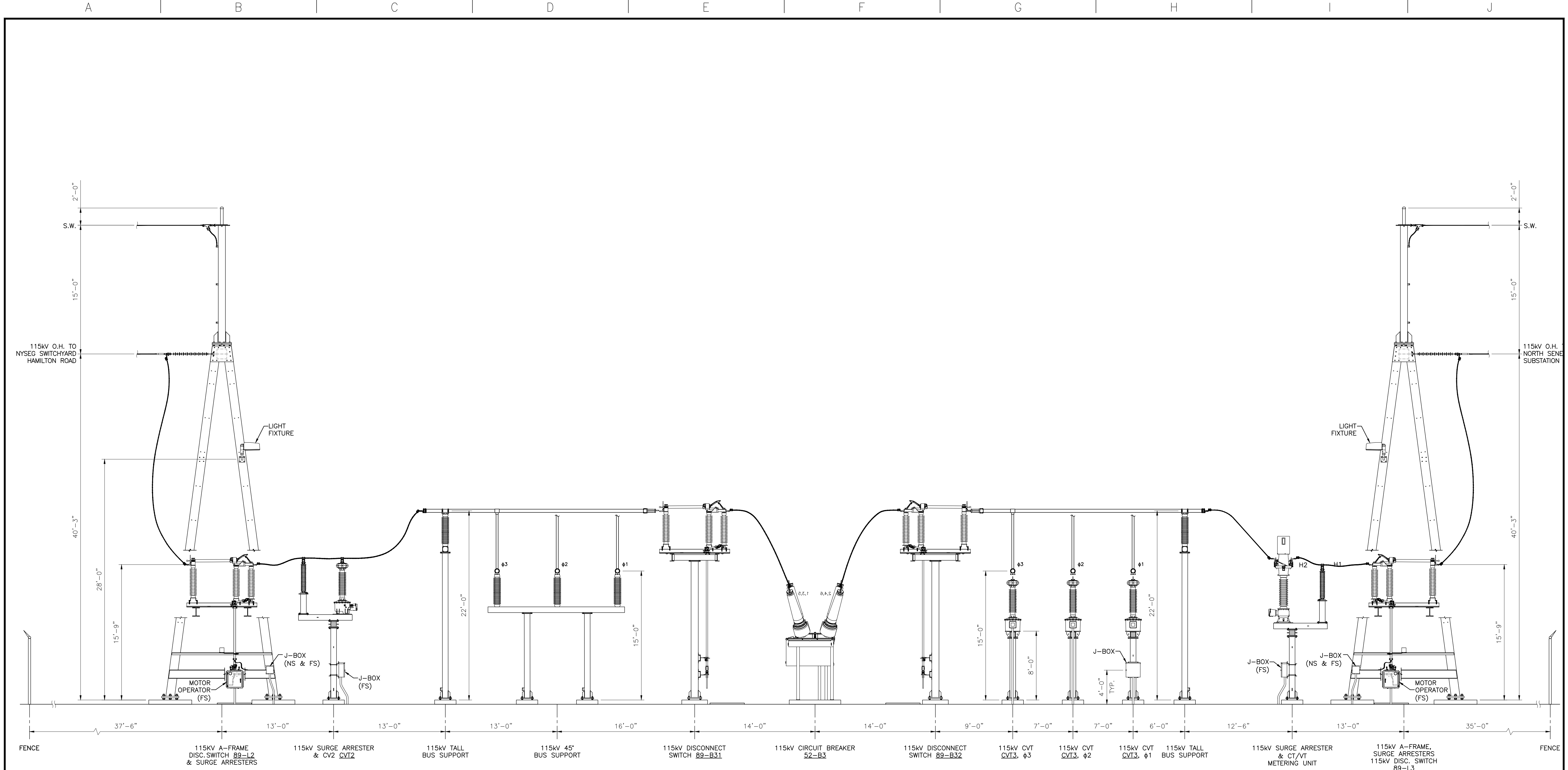
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E	11/01/24	ISSUED FOR REVIEW	SDD	MRC	BRB	A	11/17/23	ISSUED FOR REVIEW	SDD	MRC	BRB



**NORTH SENECA SOLAR PROJECT SAVION**

115kV SWITCHYARD  
GENERAL ARRANGEMENT PLAN  
PLAN VIEW

PLOT SCALE: ARCH ENGRG 0 1 2 0 1 2	SCALE: 1" = 12'-0" DWG. NO.: 701 SHEET: 01 REV.: E
------------------------------------------	----------------------------------------------------------------



ELEVATION A-A

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B	01/12/24	ISSUED FOR REVIEW	SDD	MRC	BRB				SDD	MRC	BRB
E	11/01/24	ISSUED FOR REVIEW	SDD	MRC	BRB	A	11/17/23	ISSUED FOR REVIEW	SDD	MRC	BRB

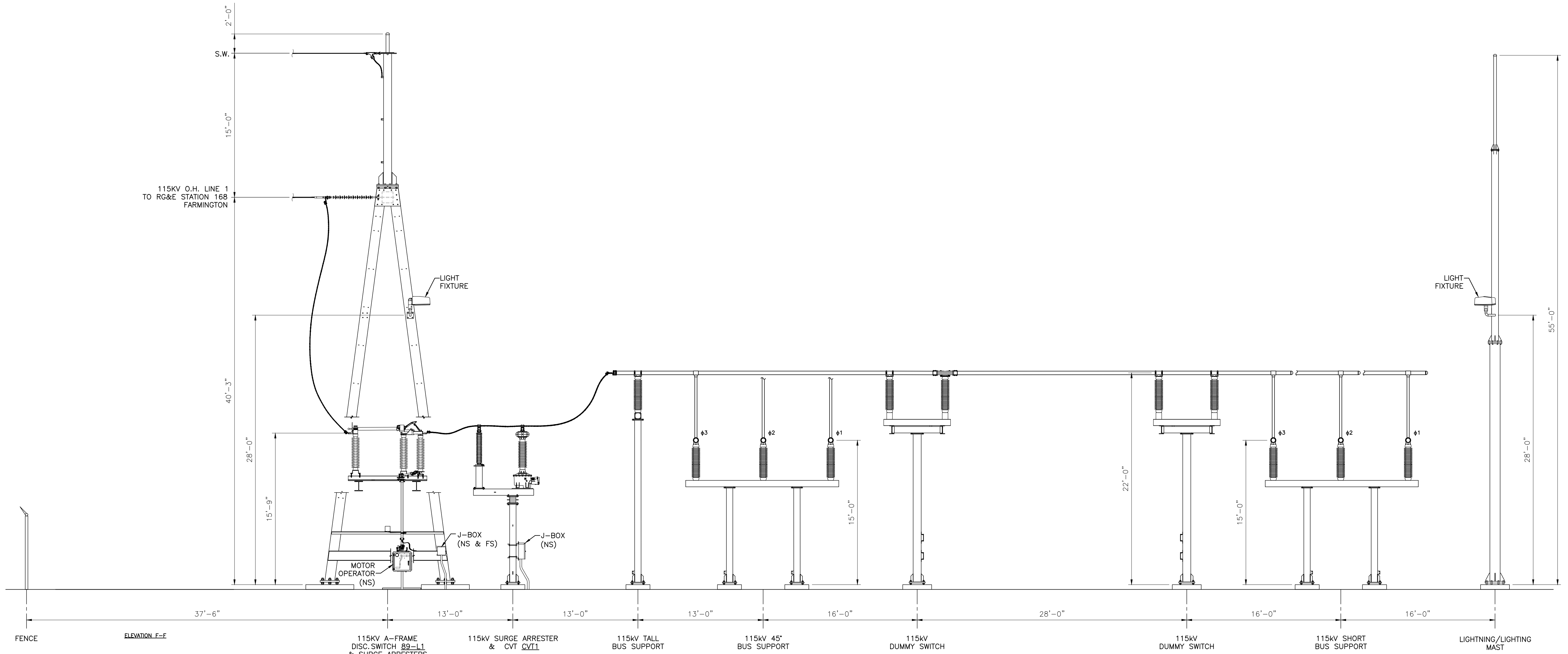


NORTH SENECA SOLAR PROJECT  
SAVION  
115kV SWITCHYARD  
GENERAL ARRANGEMENT PLAN  
ELEVATION VIEW

PROJ. NO.:	19349	SCALE:	3/16"=1'-0"
DWG. NO.:	701	SHEET:	02
REV.:	E		

A | B | C | D | E | F | G | H | I | J

1  
2  
3  
4  
5  
6  
7



ELEVATION B-B

PRELIMINARY  
DRAWING  
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CONSTRUCTION

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E	11/01/24	ISSUED FOR REVIEW	SDD	MRC	BRB	A	11/17/23	ISSUED FOR REVIEW	SDD	MRC	BRB

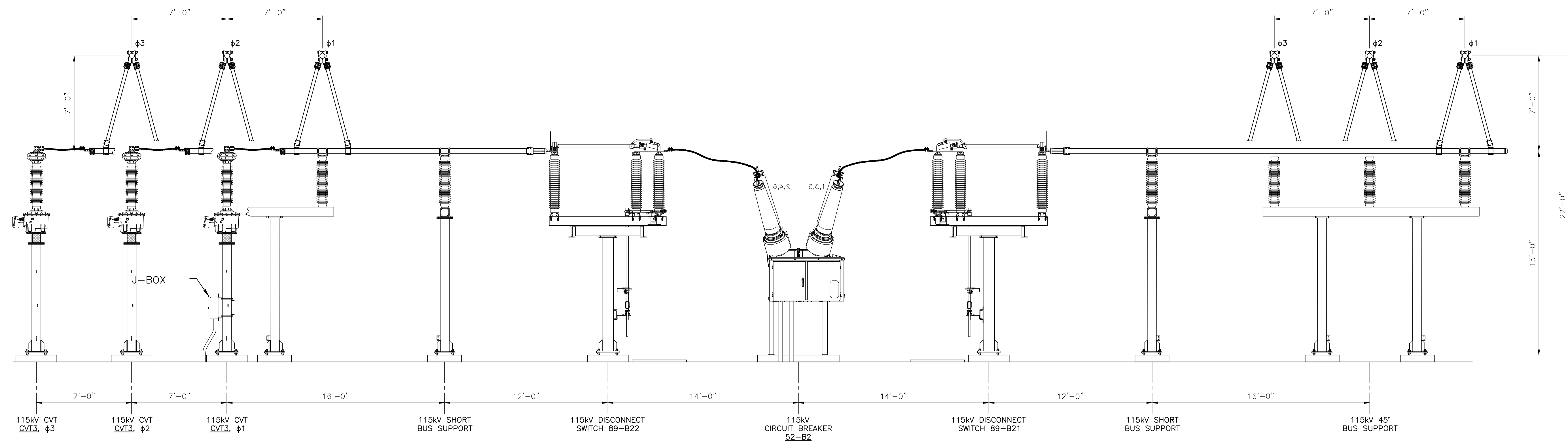


NORTH SENECA SOLAR PROJECT  
SAVION

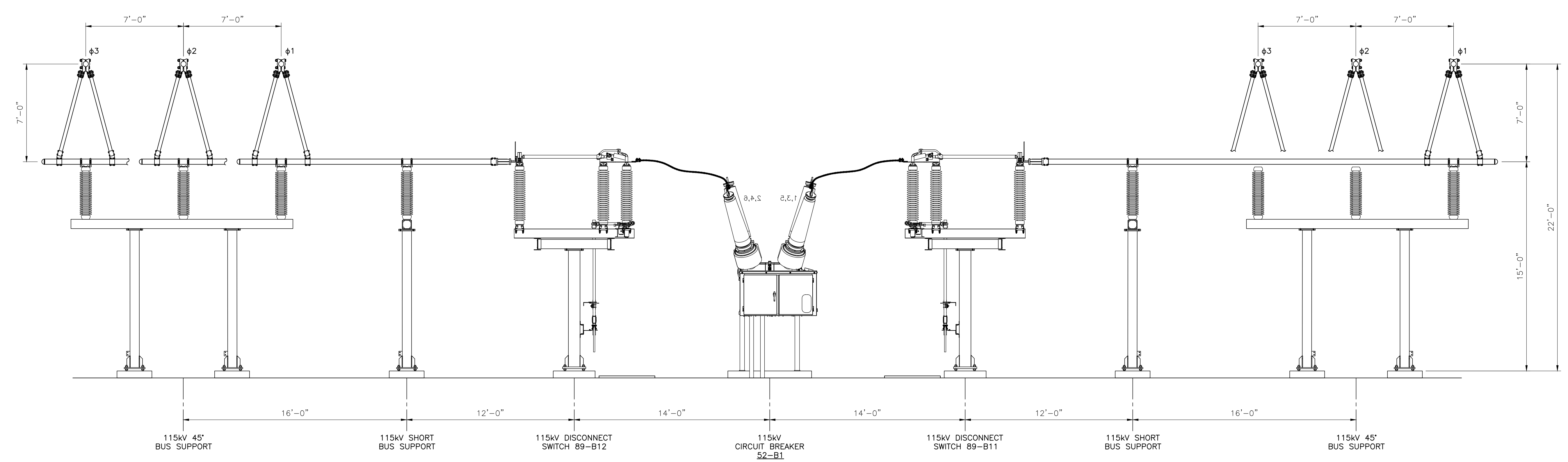
115kV SWITCHYARD  
GENERAL ARRANGEMENT PLAN  
ELEVATION VIEW

PROJ. NO.:	19349	SCALE:	3/16"=1'-0"
DWG. NO.:	701	SHEET:	03
ARCH ENGRG	0	REV.:	E

A | B | C | D | E | F | G | H | I | J



ELEVATION C-C



ELEVATION D-D

PRELIMINARY  
DRAWING  
NOT FOR  
CONSTRUCTION

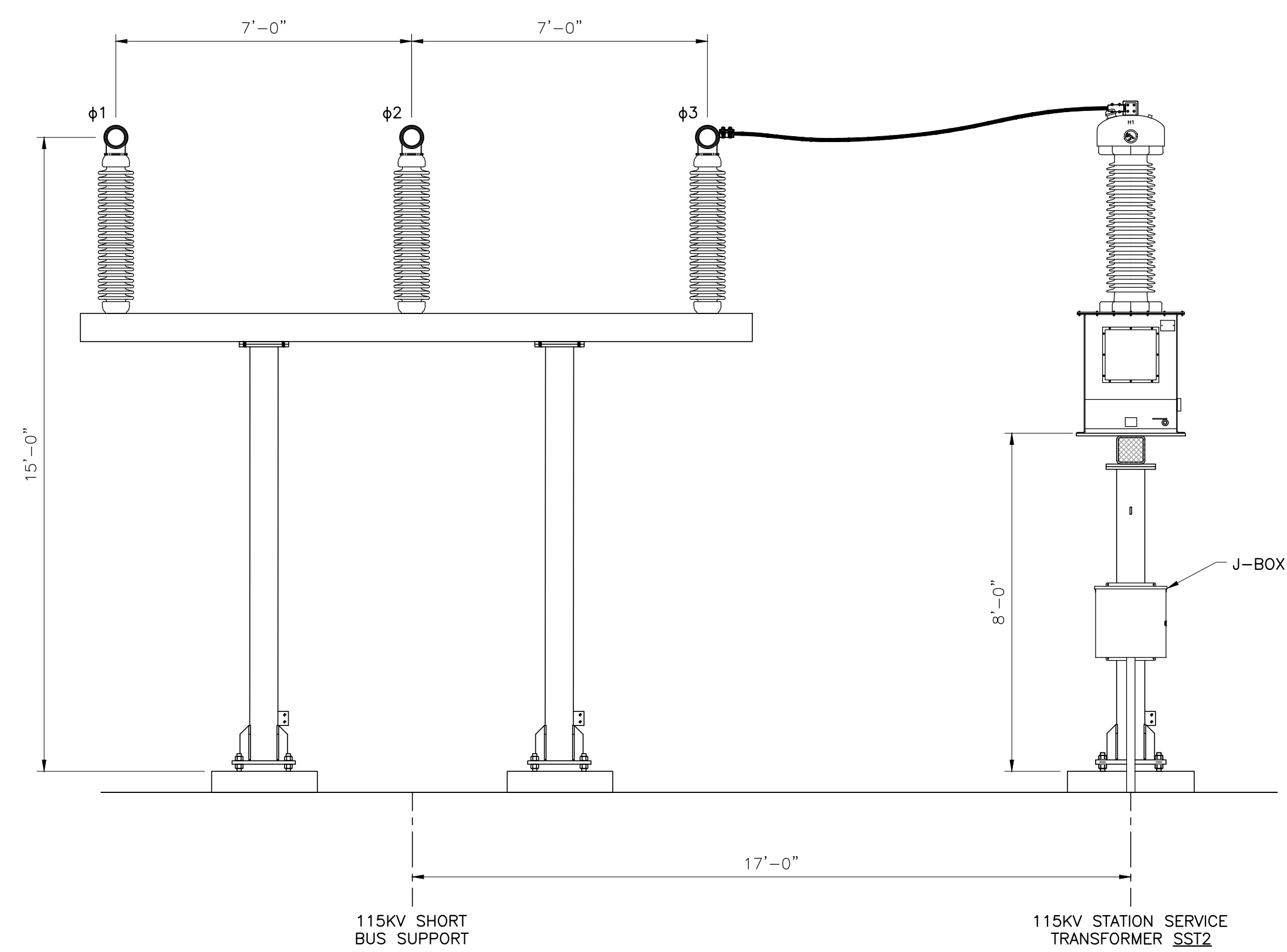
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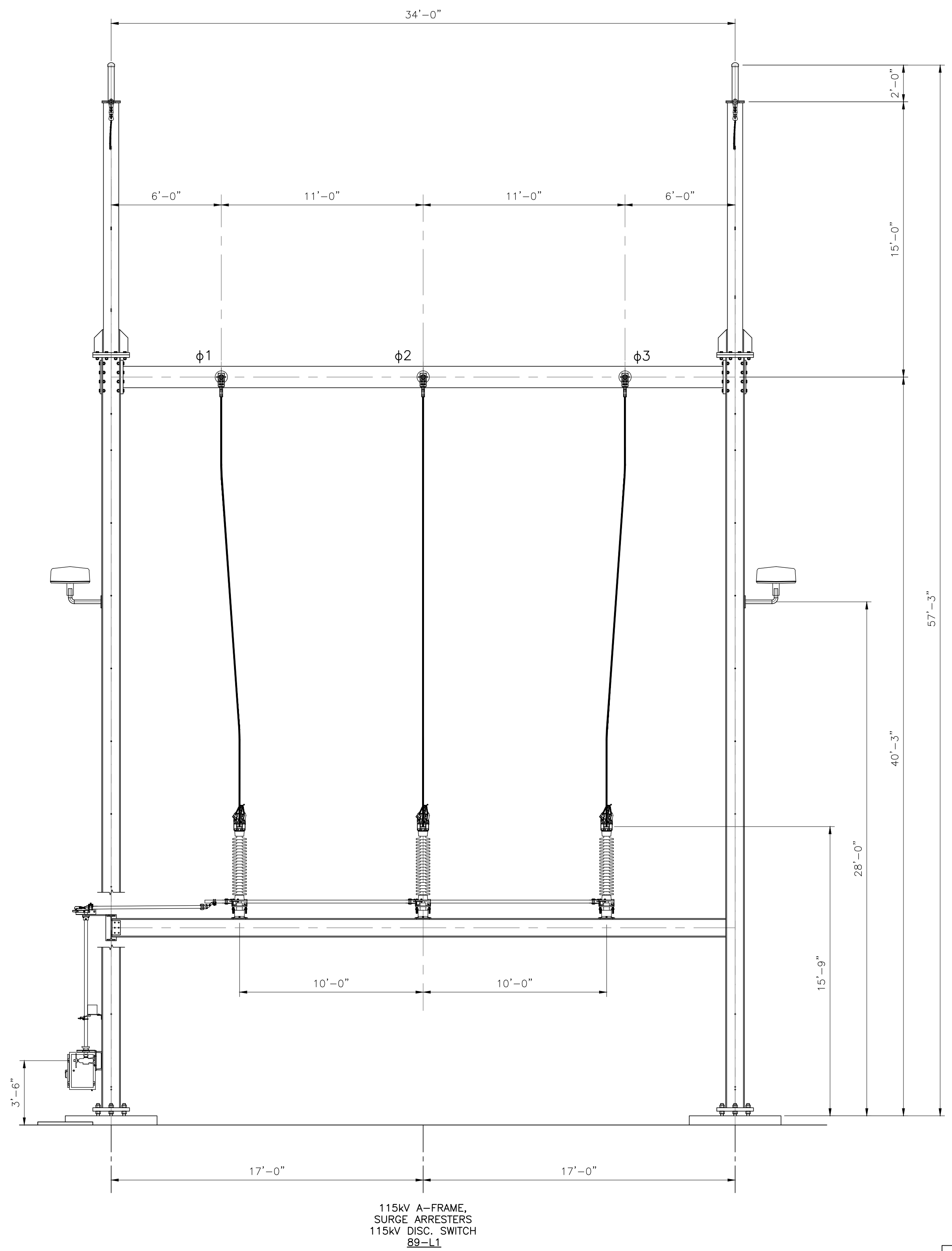


NORTH SENECA SOLAR PROJECT  
SAVION  
115kV SWITCHYARD  
GENERAL ARRANGEMENT PLAN  
ELEVATION VIEWS

PROJ. NO.:	19349	SCALE:	1/4"=1'-0"
DWG. NO.:	701	SHEET:	04
REV.:			E



ELEVATION E-E



115kV A-FRAME SURGE ARRESTERS  
115kV DISC. SWITCH 89-L1

ELEVATION F-F  
SCALE: 1/4"=1'-0"

PRELIMINARY  
DRAWING  
NOT FOR  
CONSTRUCTION

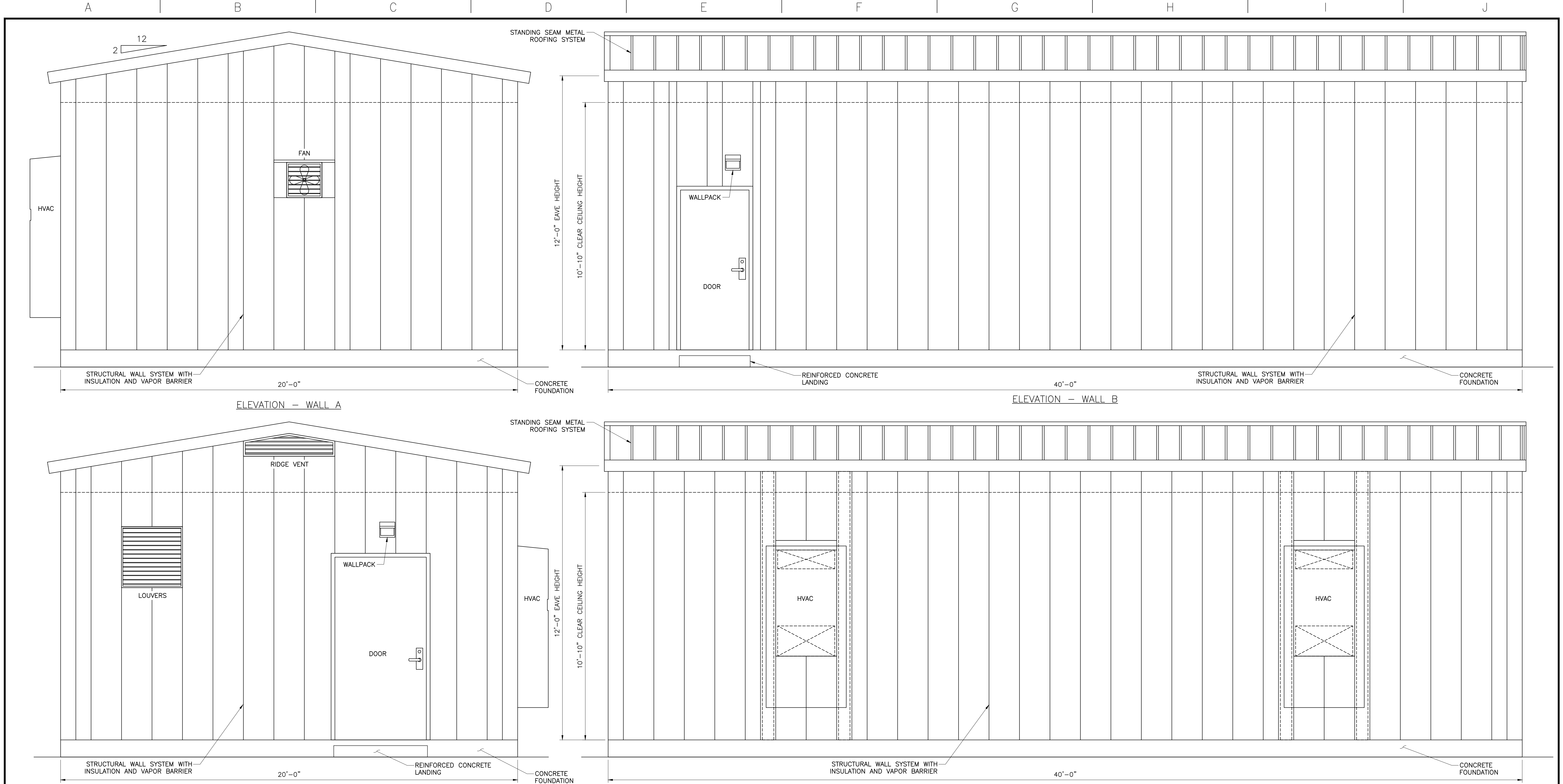
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NORTH SENECA SOLAR PROJECT  
SAVION  
115kV SWITCHYARD  
GENERAL ARRANGEMENT PLAN  
ELEVATION VIEWS

PROJ. NO.:	19349	SCALE:	3/8"=1'-0" U.N.O.
DWG. NO.:	701	SHEET:	05
REV.:		REV.:	E



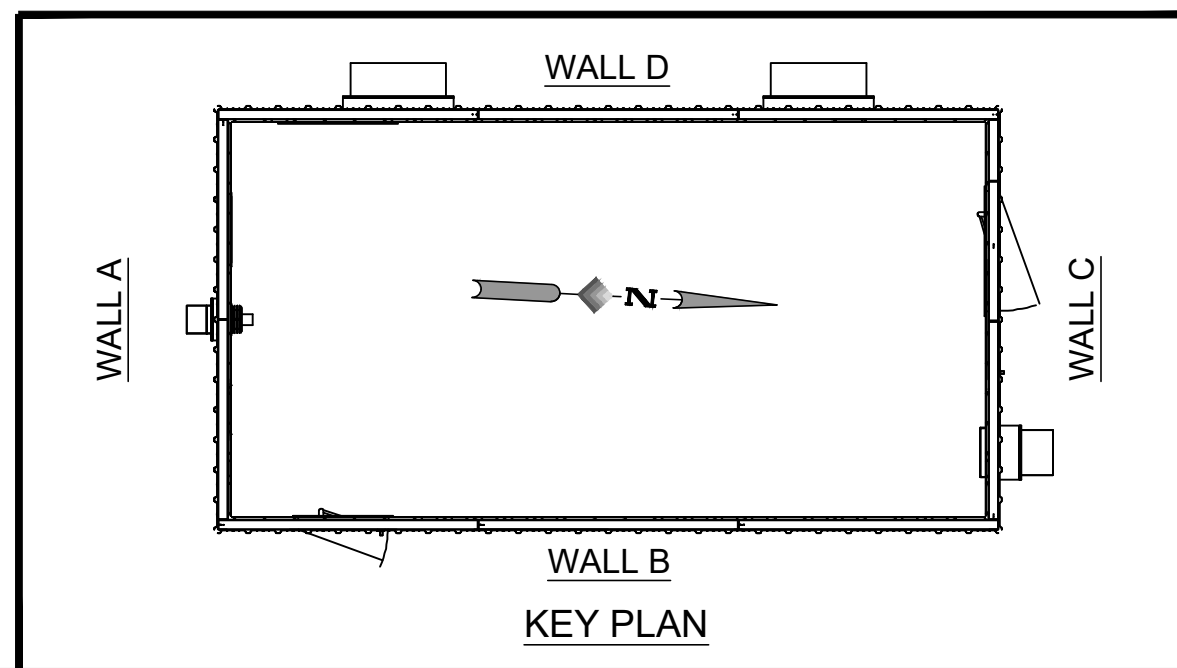
ELEVATION - WALL A

ELEVATION - WALL B

ELEVATION - WALL C

ELEVATION - WALL D

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NORTH SENECA SOLAR PROJECT  
SAVION  
115kV SWITCHYARD  
GENERAL ARRANGEMENT PLAN  
ELEVATION VIEWS

PROJ. NO.:	19349	SHEET:	06	REV.:	D
DWG. NO.:	701				

