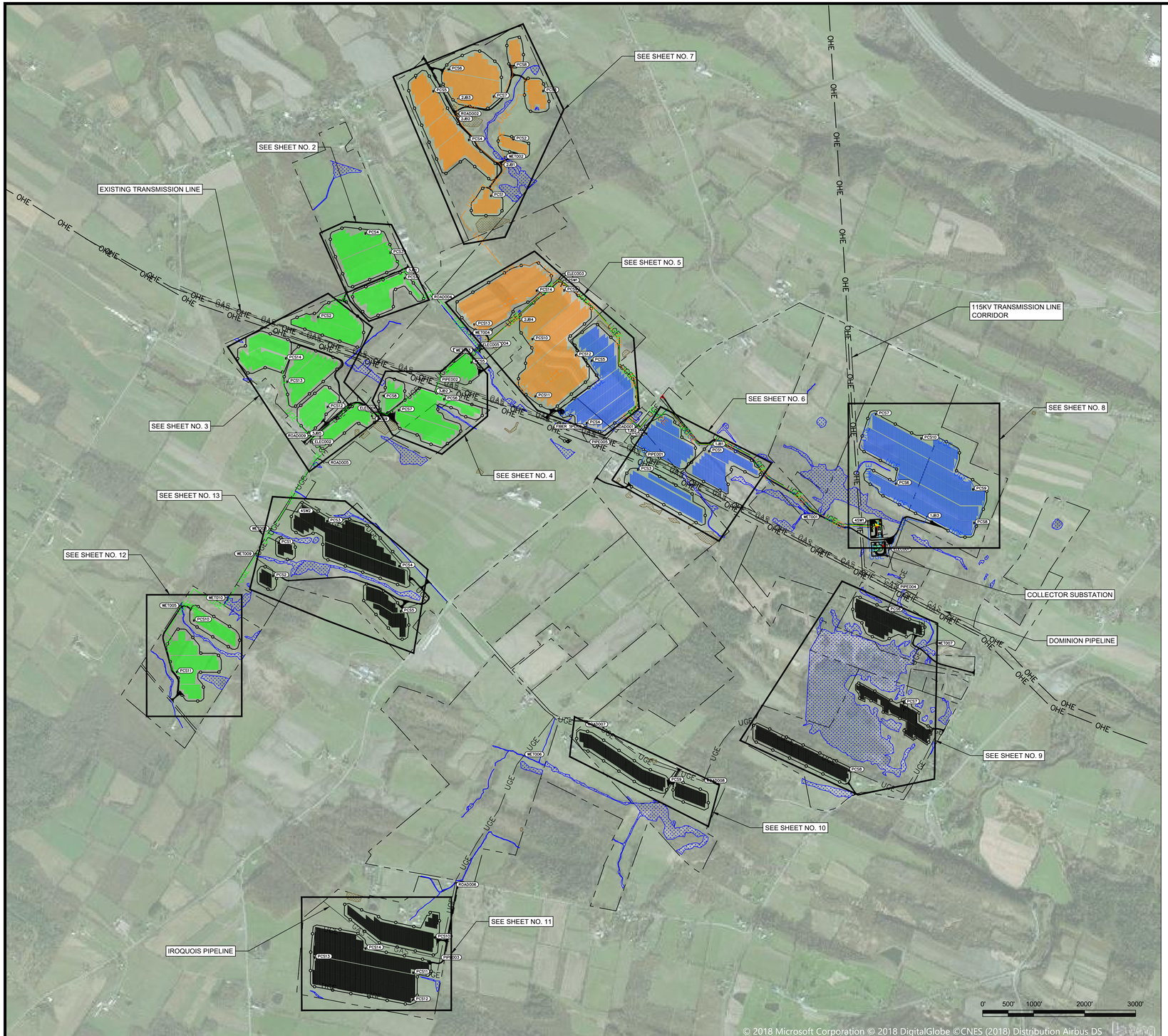


PROJECT DATA

CAPACITY (AC):	95.85MW / 106.5MVA DERATED TO 90.5MW / 99MVA @ POI		
CAPACITY (DC):	131.99MWp		
PV MODULES:		INVERTERS:	
MFR:	CANADIAN SOLAR	MFR:	SMA
MODEL:	CS3U-360PB-FG	MODEL:	HIGH POWER PEAK 3
NAMEPLATE:	360Wp / 405Wp	NAMEPLATE:	135kW / 150kVA
QUANTITY:	325,890	QUANTITY:	710
ARRAY:			
MFR:	ARRAY TECHNOLOGIES	STRING LENGTH = 27 MODULES IN SERIES	
LENGTH:	HORIZONTAL SINGLE AXIS TRACKER	TOTAL STRING COUNT = 12,070	
TILT:	0°		
ORIENTATION:	E-W +/-52°		
GCR:	33.3%		

LEGEND

- UGE — 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 1
- UGE — 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 2
- UGE — 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 3
- UGE — 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 4
- CIRCUIT 1 PANELS
- CIRCUIT 3 PANELS
- CIRCUIT 2 PANELS
- CIRCUIT 4 PANELS
- SWITCH
- 1MVA STEP-UP TRANSFORMER
- COMBINER BOX
- 2MVA STEP-UP TRANSFORMER
- UNDERGROUND CROSSING
- 3MVA STEP-UP TRANSFORMER
- GAS — GAS LINE
- FENCE LINE
- DELINEATED WETLAND
- OHE — OVERHEAD ELECTRIC LINE
- ENVIRONMENTALLY SENSITIVE NO ACCESS/GROUND DISTURBANCE

NOTES

1. EQUIPMENT LOCATIONS ARE PRELIMINARY AND SUBJECT TO CHANGE.
2. FINAL LAYOUT AND ARRANGEMENT TO BE DETERMINED DURING THE FUTURE DETAILED DESIGN PHASE

N

NY STATE PLANE
EAST ZONE
NY83-EF - US FEET

NO.	REVISIONS	DATE	BY	CHK	APR

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/19/18	RAA	NM	JAB
B	ISSUED FOR REVIEW	2/22/19	JPD	NJM	JAB
C	ISSUED FOR REVIEW	4/17/19	JPD	NJM	JAB

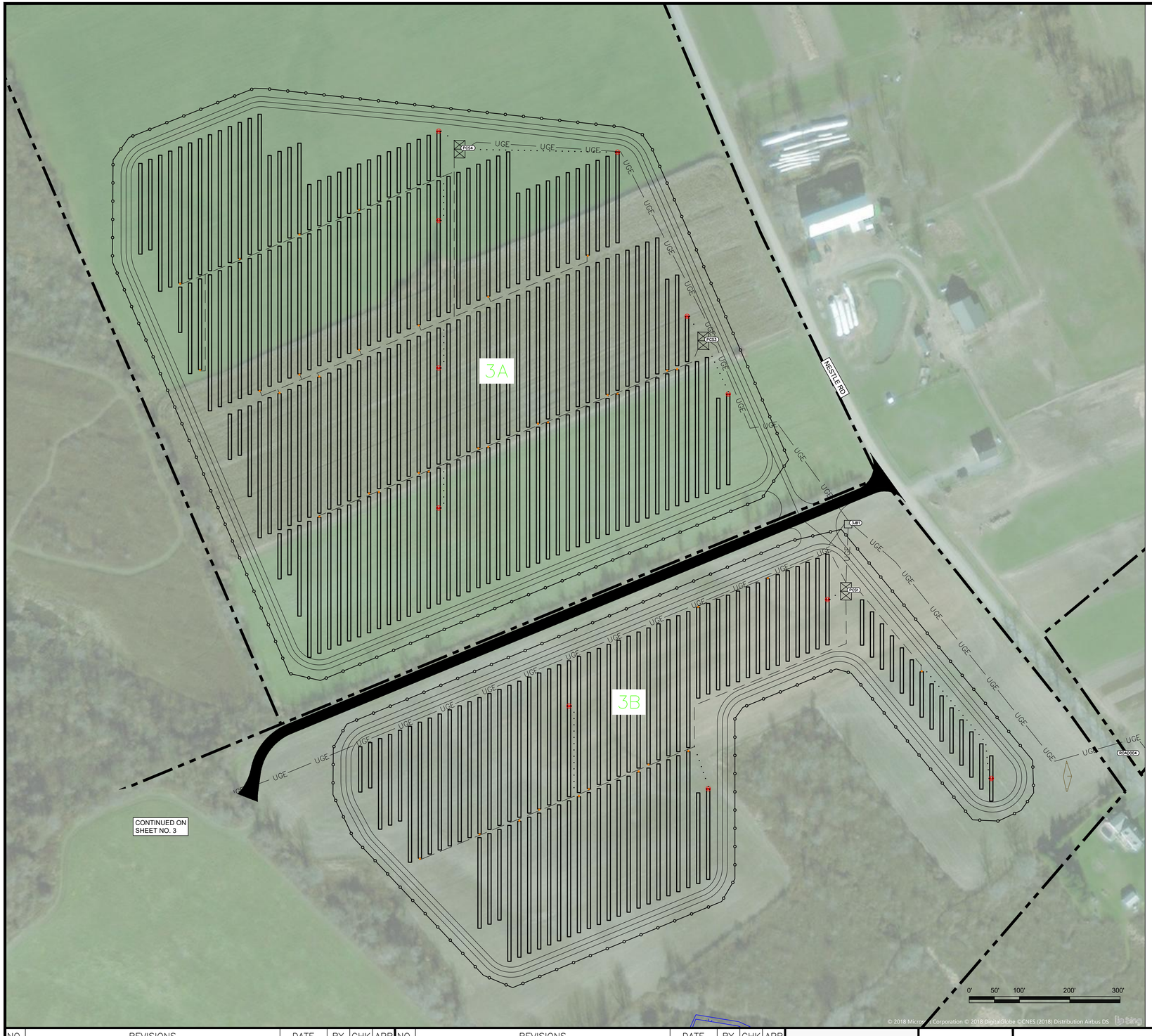
AVANGRID RENEWABLES

MOTT MACDONALD
10415 MORADO CIRCLE
BUILDING 1, SUITE 200
AUSTIN, TX 78759
PHONE 512.342.9516
FAX 512.342.9708

ENGINEERING RECORD	DATE
DRAWN: R. ANSON	12/19/18
DESIGNED: N. MATTHYSSE	12/19/18
CHECKED: J. BERKOW	12/19/18
APPROVED: J. BERKOW	12/19/18

MOHAWK SOLAR
OVERALL SITE PLAN

CADFILE: MHS-E-401-01.dwg | SCALE: 1"=1000' | DWG.NO. MHS-E-401-01 | SHEET 1 of 13 | REV C



PROJECT DATA

CAPACITY (AC): 5.13MW / 5.70MVA
CAPACITY (DC): 7.06MWp

PV MODULES:
- MFR: CANADIAN SOLAR
- MODEL: CS3U-360PB-FG
- NAMEPLATE: 360Wp / 405Wp
- QUANTITY: 17,442

INVERTERS:
- MFR: SMA
- MODEL: HIGH POWER PEAK 3
- NAMEPLATE: 135kW / 150kVA
- QUANTITY: 38

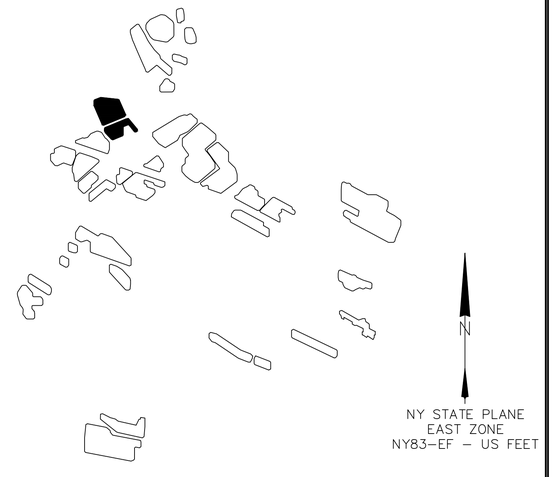
ARRAY:
- MFR: ARRAY TECHNOLOGIES
- LENGTH: HORIZONTAL SINGLE AXIS TRACKER
- TILT: 0°
- ORIENTATION: E-W +/-52°
- GCR: 33.3%

STRING LENGTH = 27 MODULES IN SERIES
TOTAL STRING COUNT = 646

LEGEND

- SWITCH
- JUNCTION BOX
- COMBINER BOX
- TRACKER MOTOR
- GRASSED ACCESS CORRIDOR
- PARCEL BOUNDARY
- FENCE LINE
- GAS LINE
- DELINEATED WETLAND
- ENVIRONMENTALLY SENSITIVE NO ACCESS/GROUND DISTURBANCE
- 1MVA STEP-UP TRANSFORMER
- 2MVA STEP-UP TRANSFORMER
- 3MVA STEP-UP TRANSFORMER
- UNDERGROUND CROSSING
- LOW VOLTAGE AC CABLE
- DC CABLE
- OVERHEAD ELECTRIC LINE
- UNDERGROUND ELECTRIC LINE
- ACCESS ROAD

KEY PLAN – 1"=3000'



NY STATE PLANE
EAST ZONE
NY83-EF – US FEET

NO.	REVISIONS	DATE	BY	CHK	APR

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/19/18	RAA	NM	JAB
B	ISSUED FOR REVIEW	2/22/19	JPD	NJM	JAB
C	ISSUED FOR REVIEW	4/17/19	JPD	NJM	JAB

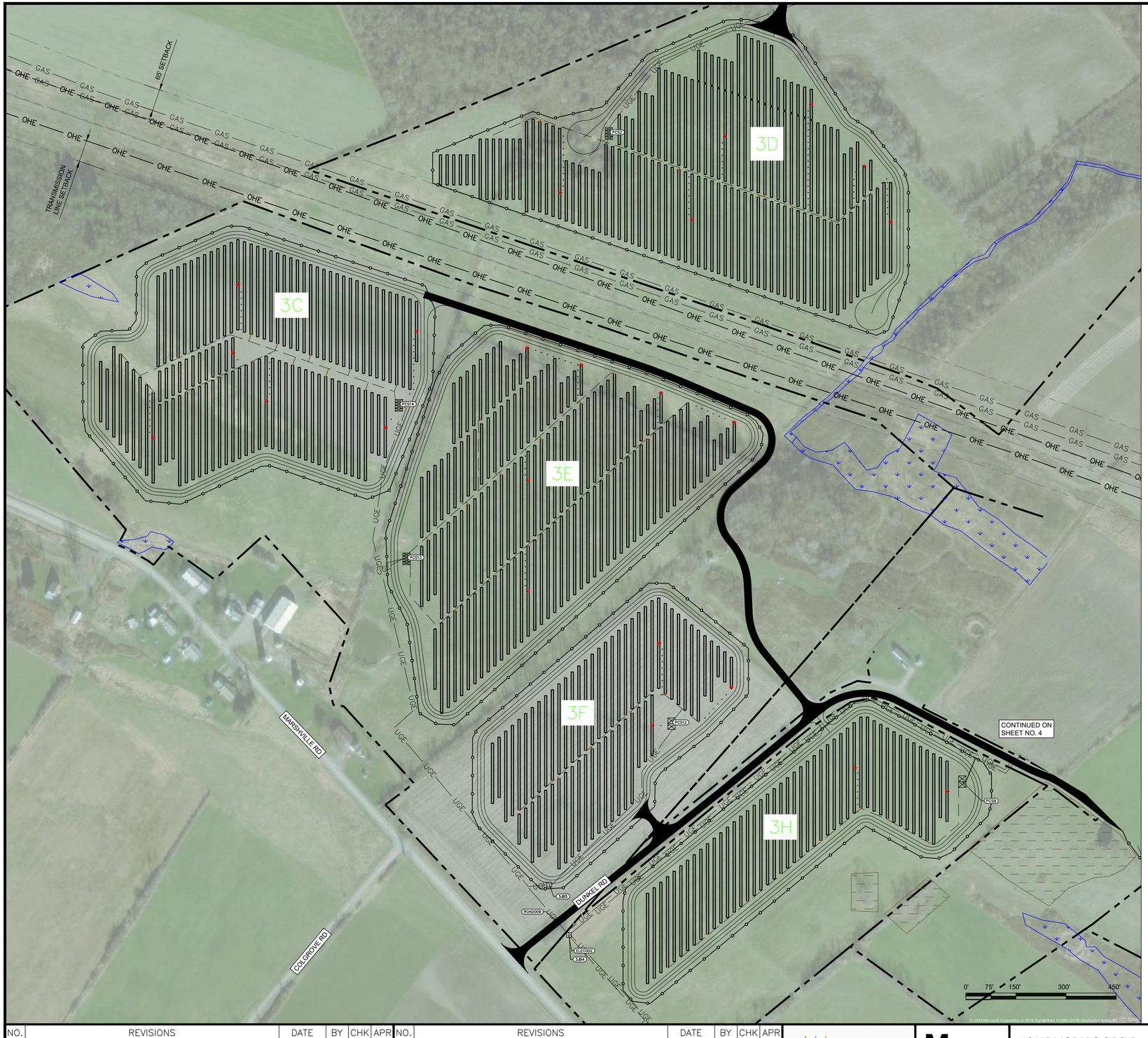
AVANGRID RENEWABLES

MOTT MACDONALD
10415 MORADO CIRCLE
BUILDING 1, SUITE 200
AUSTIN, TX 78759
PHONE 512.342.9516
FAX 512.342.9708

ENGINEERING RECORD	DATE
DRAWN: R. ANSON	12/19/18
DESIGNED: N. MATTHYSSE	12/19/18
CHECKED: J. BERKOW	12/19/18
APPROVED: J. BERKOW	12/19/18

MOHAWK SOLAR
ARRAY PARCEL DETAILS

CADFILE: MHS-E-401-02.dwg | SCALE: 1"=100' | DWG.NO. MHS-E-401-02 | SHEET 2 of 13 | REV C



PROJECT DATA

CAPACITY (AC): 9.05MW / 10.06MVA
CAPACITY (DC): 12.47MWp

PV MODULES:
- MFR: CANADIAN SOLAR
- MODEL: CS3U-360PB-FG
- NAMEPLATE: 360Wp / 405Wp
- QUANTITY: 30,780

INVERTERS:
- MFR: SMA
- MODEL: HIGH POWER PEAK 3
- NAMEPLATE: 135kW / 150kVA
- QUANTITY: 67

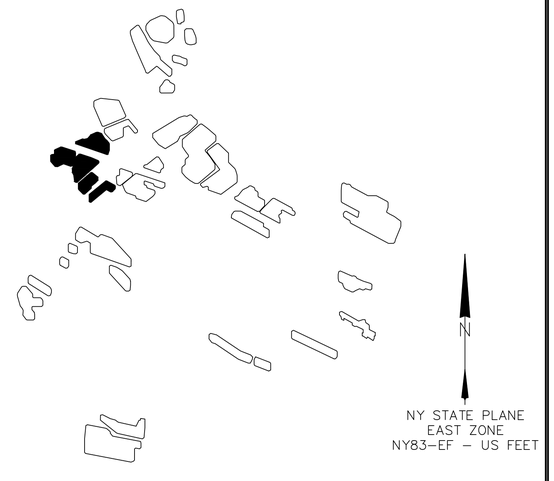
ARRAY:
- MFR: ARRAY TECHNOLOGIES
- LENGTH: HORIZONTAL SINGLE AXIS TRACKER
- TILT: 0°
- ORIENTATION: E-W +/-52°
- GCR: 33.3%

STRING LENGTH = 27 MODULES IN SERIES
TOTAL STRING COUNT = 1,140

LEGEND

- SWITCH
- JUNCTION BOX
- COMBINER BOX
- TRACKER MOTOR
- GRASSED ACCESS CORRIDOR
- PARCEL BOUNDARY
- FENCE LINE
- GAS LINE
- DELINEATED WETLAND
- ENVIRONMENTALLY SENSITIVE NO ACCESS/GROUND DISTURBANCE
- 1MVA STEP-UP TRANSFORMER
- 2MVA STEP-UP TRANSFORMER
- 3MVA STEP-UP TRANSFORMER
- UNDERGROUND CROSSING
- LOW VOLTAGE AC CABLE
- DC CABLE
- OVERHEAD ELECTRIC LINE
- UNDERGROUND ELECTRIC LINE
- ACCESS ROAD

KEY PLAN – 1"=3000'



NY STATE PLANE
EAST ZONE
NY83-EF – US FEET

NO.	REVISIONS	DATE	BY	CHK	APR

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/19/18	RAA	NM	JAB
B	ISSUED FOR REVIEW	2/22/19	JPD	NJM	JAB
C	ISSUED FOR REVIEW	4/17/19	JPD	NJM	JAB

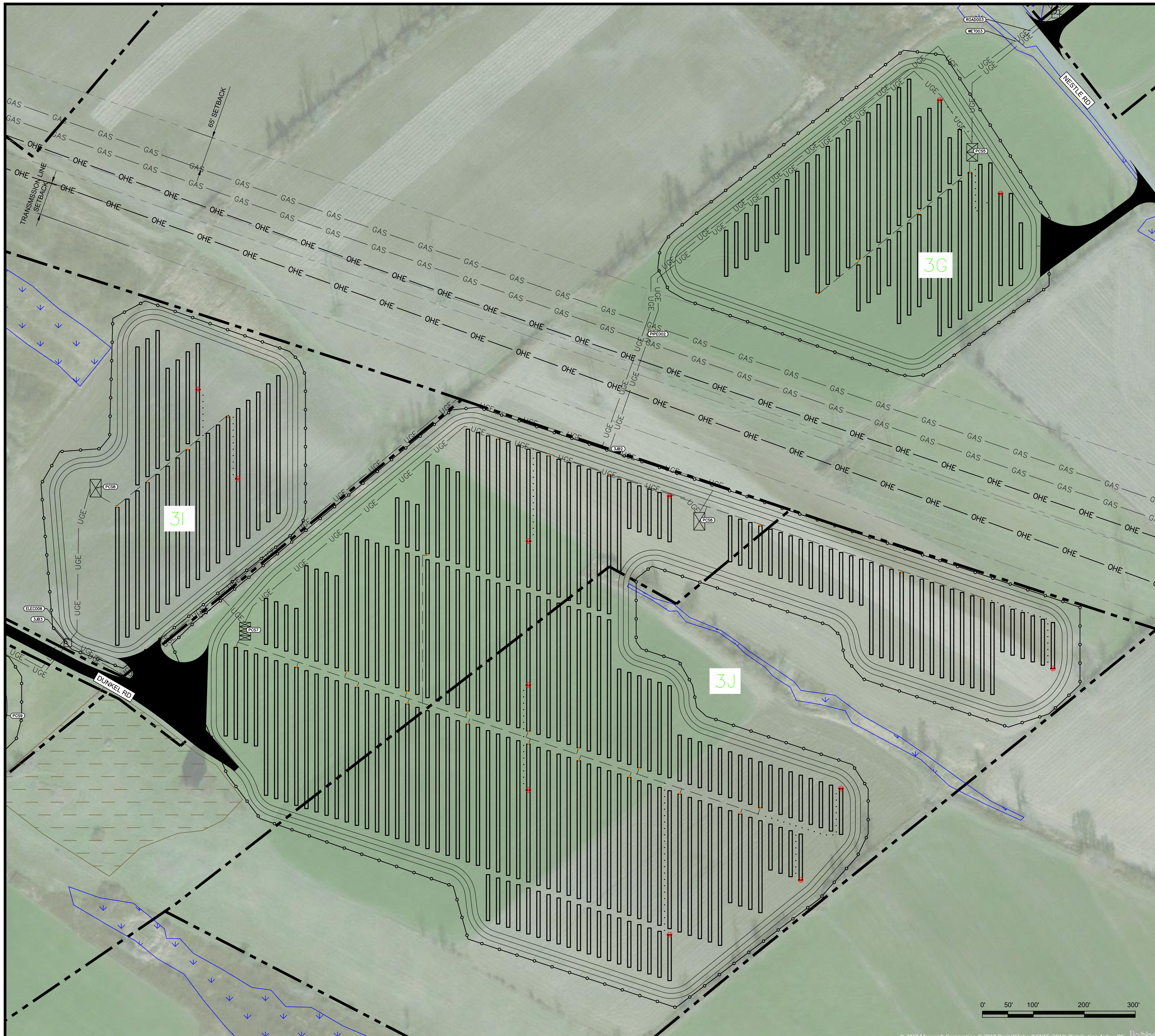
AVANGRID RENEWABLES

MOTT MACDONALD
10415 MORADO CIRCLE
BUILDING 1, SUITE 200
AUSTIN, TX 78759
PHONE 512.342.9516
FAX 512.342.9708

ENGINEERING RECORD	DATE
DRAWN: R. ANSON	12/19/18
DESIGNED: N. MATTHYSSE	12/19/18
CHECKED: J. BERKOW	12/19/18
APPROVED: J. BERKOW	12/19/18

MOHAWK SOLAR
ARRAY PARCEL DETAILS

CADFILE: MHS-E-401-03.dwg | SCALE: 1"=150' | DWG.NO. MHS-E-401-03 | SHEET 3 of 13 | REV C



PROJECT DATA

CAPACITY (AC): 4.46MW / 4.95MVA
CAPACITY (DC): 6.13MWp

PV MODULES:
- MFR; CANADIAN SOLAR
- MODEL: CS3U–360PB–FG
- NAMEPLATE: 360Wp / 405Wp
- QUANTITY: 15,147

INVERTERS:
- MFR: SMA
- MODEL: HIGH POWER PEAK 3
- NAMEPLATE: 135kW / 150kVA
- QUANTITY: 33

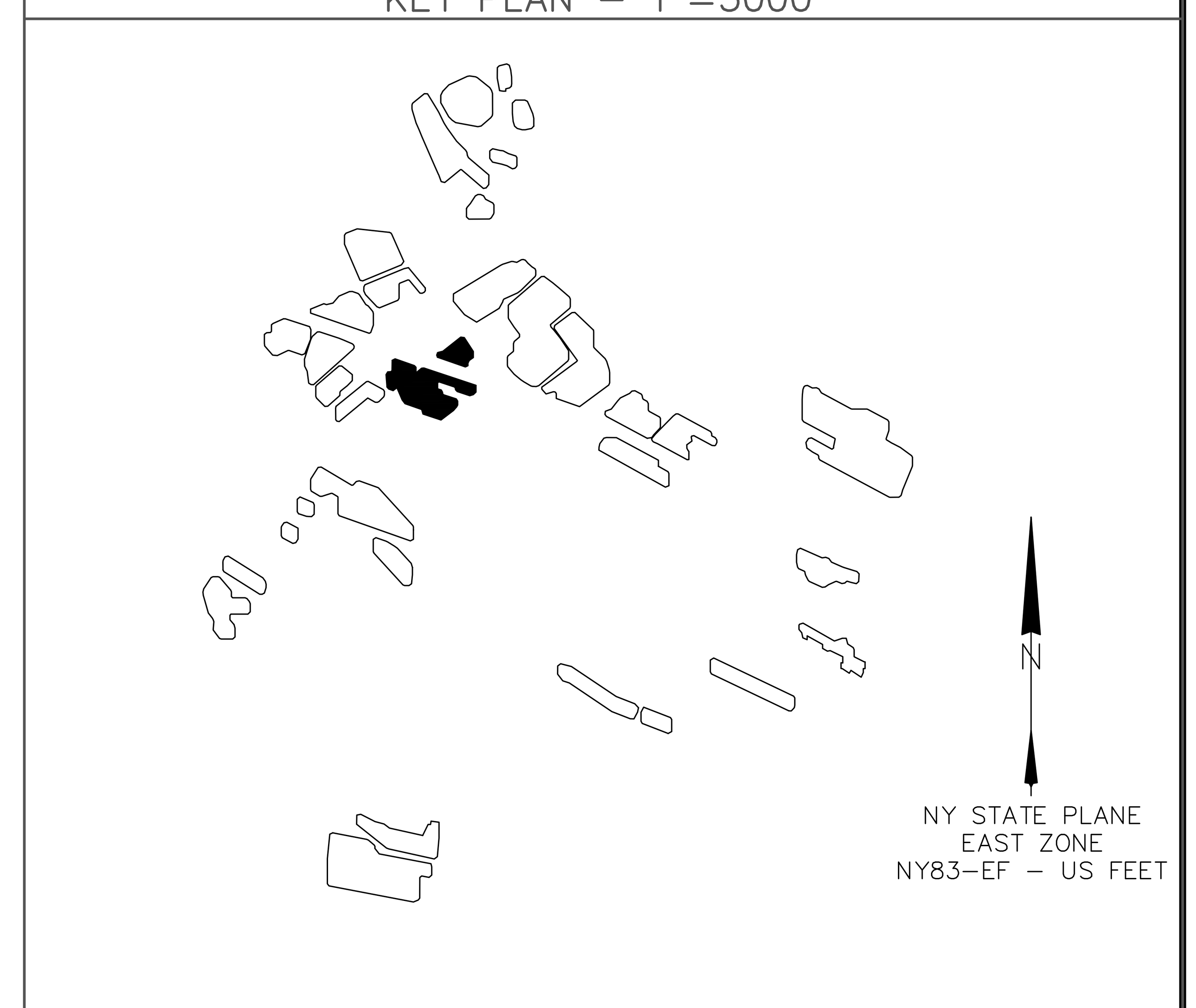
ARRAY:
- MFR: ARRAY TECHNOLOGIES
- LENGTH: HORIZONTAL SINGLE AXIS TRACKER
- TILT: 0°
- ORIENTATION: E–W +/–52°
- GCR: 33.3%

STRING LENGTH = 27 MODULES IN SERIES
TOTAL STRING COUNT = 561

LEGEND

SWITCH	1MVA STEP–UP TRANSFORMER
JUNCTION BOX	2MVA STEP–UP TRANSFORMER
COMBINER BOX	3MVA STEP–UP TRANSFORMER
TRACKER MOTOR (M)	
GRASSED ACCESS CORRIDOR	UNDERGROUND CROSSING
PARCEL BOUNDARY	LOW VOLTAGE AC CABLE
FENCE LINE	DC CABLE
GAS — GAS LINE	OHE — OVERHEAD ELECTRIC LINE
DELINEATED WETLAND	UGE — UNDERGROUND ELECTRIC LINE
ENVIRONMENTALLY SENSITIVE NO ACCESS/GROUND DISTURBANCE	ACCESS ROAD

KEY PLAN – 1"=3000'



NO.	REVISIONS	DATE	BY	CHK	APR

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/19/18	RAA	NM	JAB
B	ISSUED FOR REVIEW	2/22/19	JPD	NJM	JAB
C	ISSUED FOR REVIEW	4/17/19	JPD	NJM	JAB

AVANGRID RENEWABLES

MOTT MACDONALD
10415 MORADO CIRCLE
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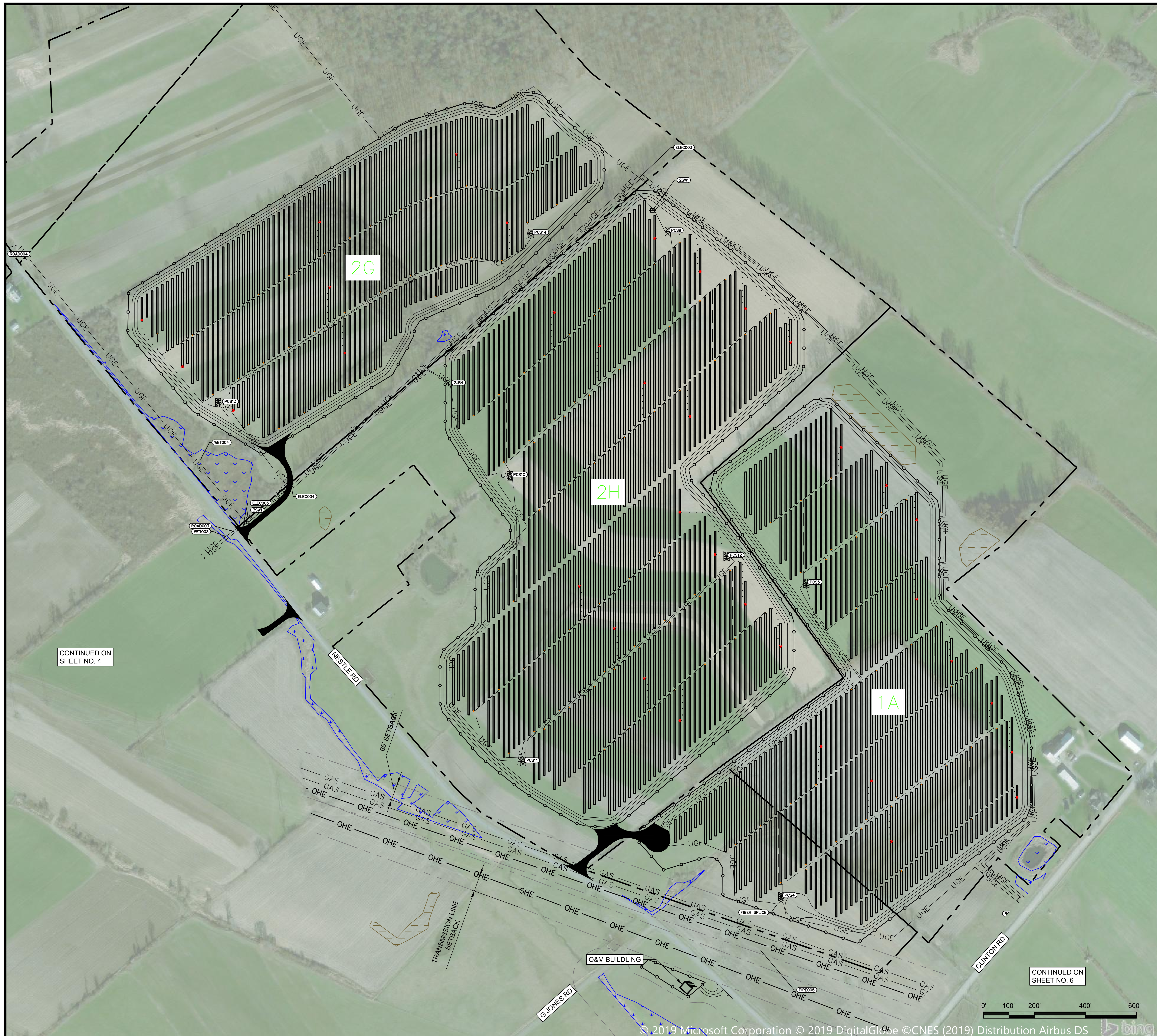
PHONE 512.342.9516
FAX 512.342.9708

ENGINEERING RECORD	DATE
DRAWN: R. ANSON	12/19/18
DESIGNED: N. MATTHYSSE	12/19/18
CHECKED: J. BERKOW	12/19/18
APPROVED: J. BERKOW	12/19/18

MOHAWK SOLAR
ARRAY PARCEL DETAILS

CADFILE: MHS–E–401–04.dwg | SCALE: 1"=100' | DWG.NO. MHS–E–401–04 | SHEET 4 of 13 | REV C



PROJECT DATA

CAPACITY (AC): 18.23MW / 20.25MVA
CAPACITY (DC): 25.10MWp

PV MODULES:
- MFR: CANADIAN SOLAR
- MODEL: CS3U-360PB-FG
- NAMEPLATE: 360Wp / 405Wp
- QUANTITY: 61,965

INVERTERS:
- MFR: SMA
- MODEL: HIGH POWER PEAK 3
- NAMEPLATE: 135kW / 150kVA
- QUANTITY: 135

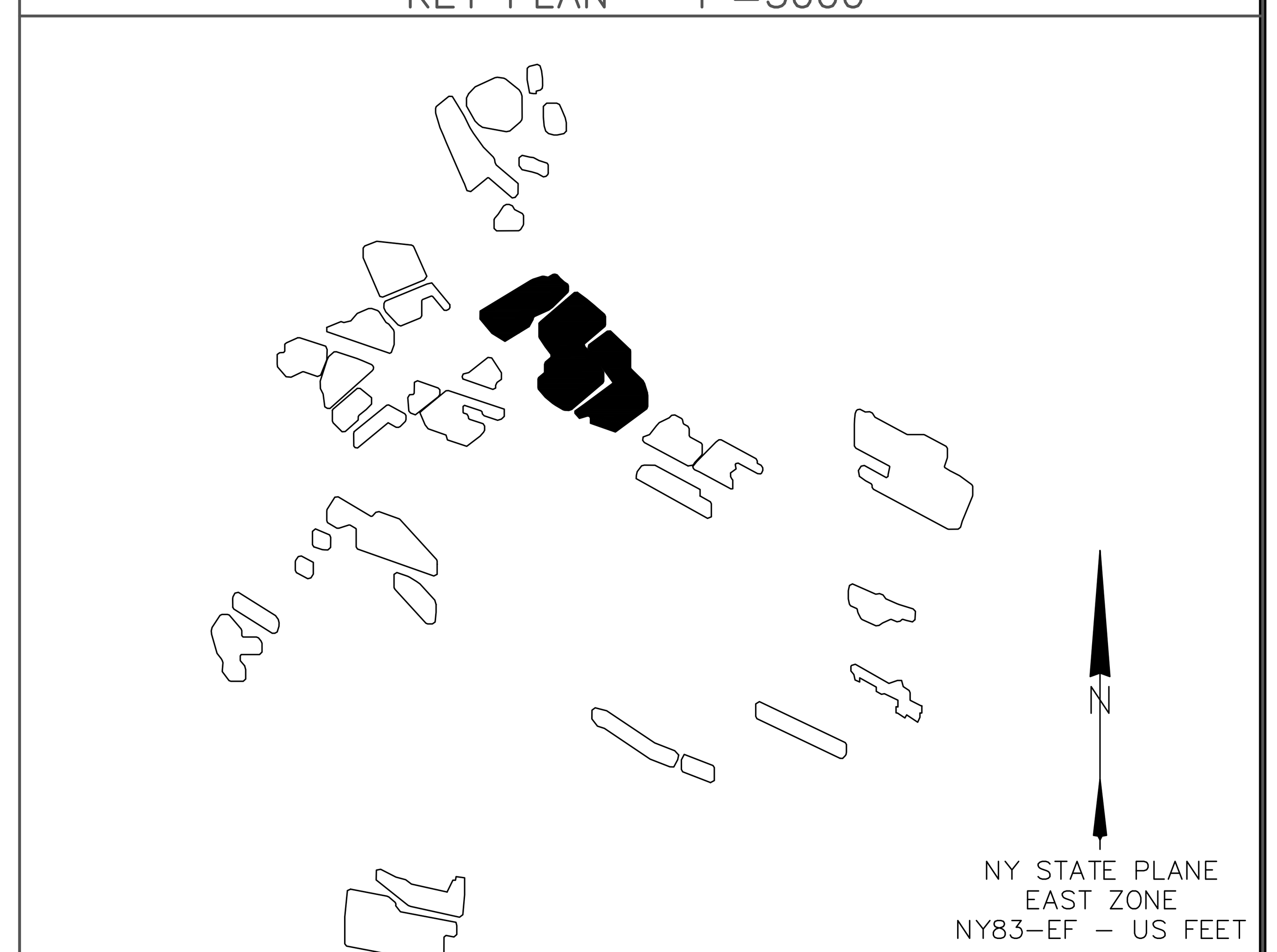
ARRAY:
- MFR: ARRAY TECHNOLOGIES
- LENGTH: HORIZONTAL SINGLE AXIS TRACKER
- TILT: 0°
- ORIENTATION: E-W +/-52°
- GCR: 33.3%

STRING LENGTH = 27 MODULES IN SERIES
TOTAL STRING COUNT = 2,295

LEGEND

- SWITCH
- JUNCTION BOX
- COMBINER BOX
- TRACKER MOTOR
- GRASSED ACCESS CORRIDOR
- PARCEL BOUNDARY
- FENCE LINE
- GAS — GAS LINE
- DELINEATED WETLAND
- ENVIRONMENTALLY SENSITIVE NO ACCESS/GROUND DISTURBANCE
- 1MVA STEP-UP TRANSFORMER
- 2MVA STEP-UP TRANSFORMER
- 3MVA STEP-UP TRANSFORMER
- UNDERGROUND CROSSING
- LOW VOLTAGE AC CABLE
- DC CABLE
- OHE — OVERHEAD ELECTRIC LINE
- UGE — UNDERGROUND ELECTRIC LINE
- ACCESS ROAD

KEY PLAN – 1"=3000'



NO.	REVISIONS	DATE	BY	CHK	APR

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/19/18	RAA	NM	JAB
B	ISSUED FOR REVIEW	2/22/19	JPD	NJM	JAB
C	ISSUED FOR REVIEW	4/17/19	JPD	NJM	JAB

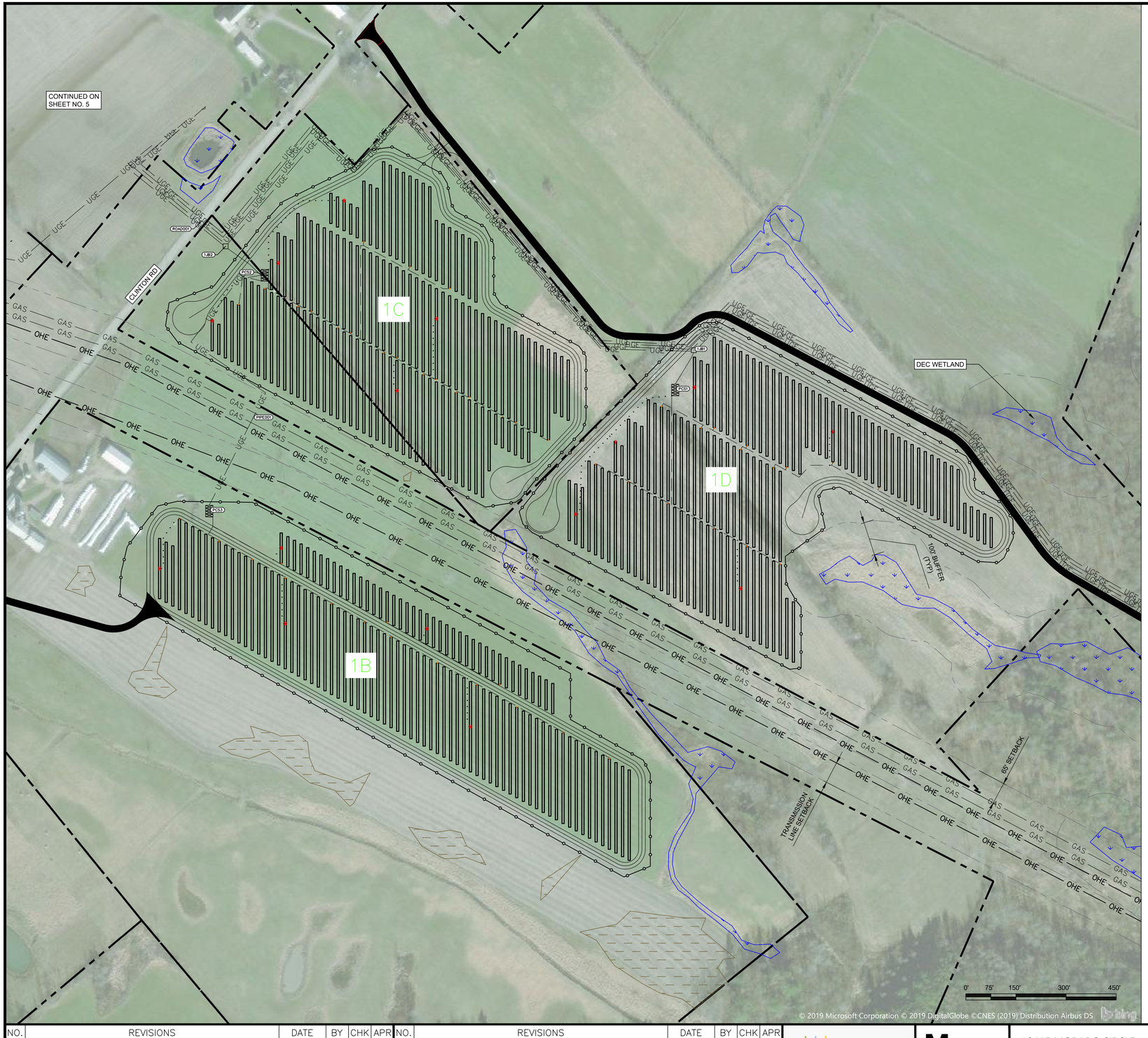
AVANGRID RENEWABLES

MOTT MACDONALD
10415 MORADO CIRCLE
BUILDING 1, SUITE 200
AUSTIN, TX 78759
PHONE 512.342.9516
FAX 512.342.9708

ENGINEERING RECORD	DATE
DRAWN: R. ANSON	12/19/18
DESIGNED: N. MATTHYSSE	12/19/18
CHECKED: J. BERKOW	12/19/18
APPROVED: J. BERKOW	12/19/18

MOHAWK SOLAR
ARRAY PARCEL DETAILS

CADFILE: MHS-E-401-05.dwg | SCALE: 1"=200' | DWG.NO. MHS-E-401-05 | SHEET 5 of 13 | REV C



PROJECT DATA

CAPACITY (AC): 6.62MW / 7.35MVA
CAPACITY (DC): 9.11MWp

PV MODULES:
- MFR: CANADIAN SOLAR
- MODEL: CS3U-360PB-FG
- NAMEPLATE: 360Wp / 405Wp
- QUANTITY: 22,491

INVERTERS:
- MFR: SMA
- MODEL: HIGH POWER PEAK 3
- NAMEPLATE: 135kW / 150kVA
- QUANTITY: 49

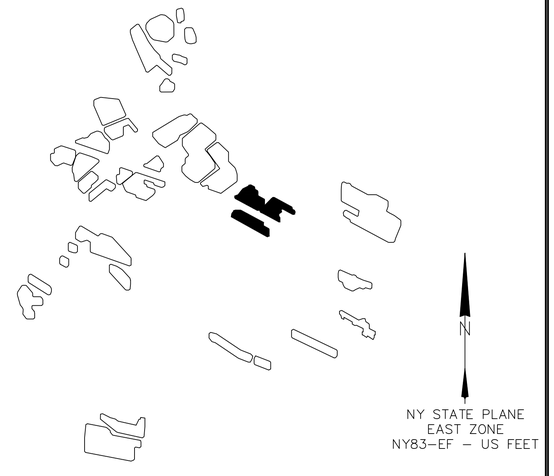
ARRAY:
- MFR: ARRAY TECHNOLOGIES
- LENGTH: HORIZONTAL SINGLE AXIS TRACKER
- TILT: 0°
- ORIENTATION: E-W +/-52°
- GCR: 33%

STRING LENGTH = 27 MODULES IN SERIES
TOTAL STRING COUNT = 833

LEGEND

- SWITCH
- JUNCTION BOX
- COMBINER BOX
- TRACKER MOTOR
- GRASSED ACCESS CORRIDOR
- PARCEL BOUNDARY
- FENCE LINE
- GAS LINE
- DELINEATED WETLAND ENVIRONMENTALLY SENSITIVE NO ACCESS/GROUND DISTURBANCE
- 1MVA STEP-UP TRANSFORMER
- 2MVA STEP-UP TRANSFORMER
- 3MVA STEP-UP TRANSFORMER
- UNDERGROUND CROSSING
- LOW VOLTAGE AC CABLE
- DC CABLE
- OVERHEAD ELECTRIC LINE
- UNDERGROUND ELECTRIC LINE
- ACCESS ROAD

KEY PLAN – 1"=3000'



NY STATE PLANE
EAST ZONE
NY83-EF – US FEET

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/19/18	RAA	NM	JAB
B	ISSUED FOR REVIEW	2/22/19	JPD	NJM	JAB
C	ISSUED FOR REVIEW	4/17/19	JPD	NJM	JAB

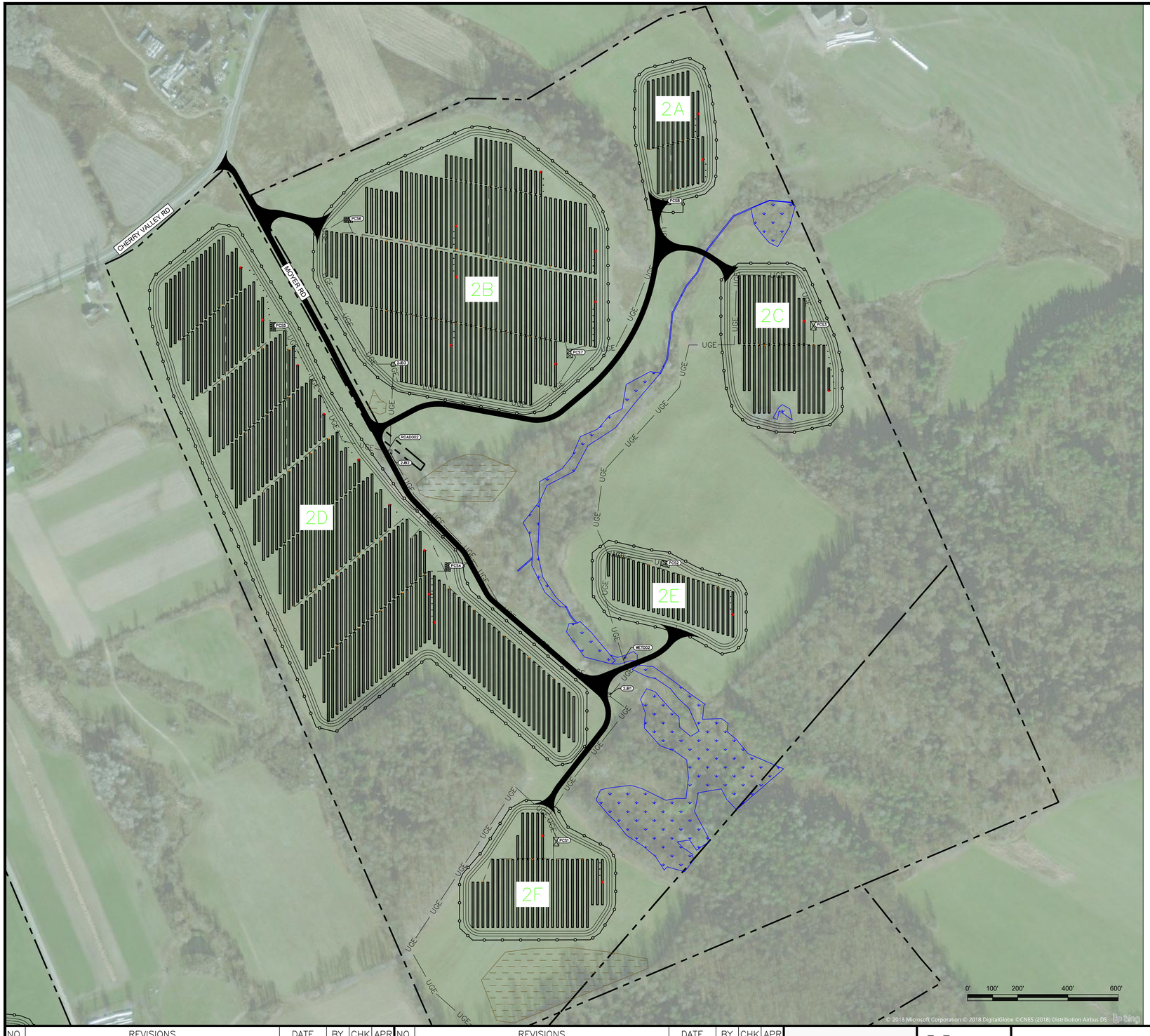
AVANGRID RENEWABLES

MOTT MACDONALD
10415 MORADO CIRCLE
BUILDING 1, SUITE 200
AUSTIN, TX 78759
PHONE 512.342.9516
FAX 512.342.9708

ENGINEERING RECORD	DATE
DRAWN: R. ANSON	12/19/18
DESIGNED: N. MATTHYSSE	12/19/18
CHECKED: J. BERKOW	12/19/18
APPROVED: J. BERKOW	12/19/18

MOHAWK SOLAR
ARRAY PARCEL DETAILS

CADFILE: MHS-E-401-06.dwg | SCALE: 1"=150' | DWG.NO. MHS-E-401-06 | SHEET 6 of 13 | REV C



PROJECT DATA

CAPACITY (AC): 10.26MW / 11.40MVA
CAPACITY (DC): 14.13MWp

PV MODULES:
- MFR: CANADIAN SOLAR
- MODEL: CS3U-360PB-FG
- NAMEPLATE: 360Wp / 405Wp
- QUANTITY: 34,884

INVERTERS:
- MFR: SMA
- MODEL: HIGH POWER PEAK 3
- NAMEPLATE: 135kW / 150kVA
- QUANTITY: 76

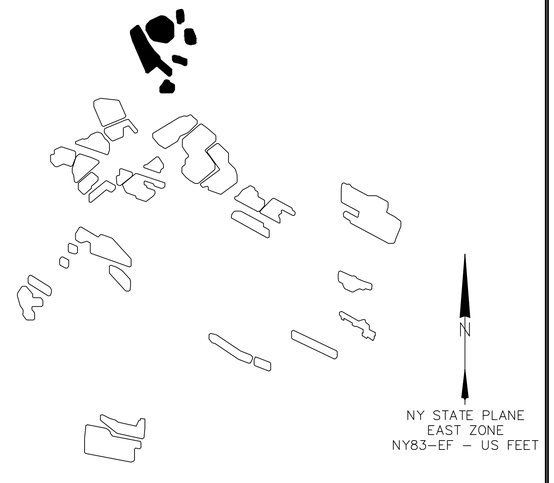
ARRAY:
- MFR: ARRAY TECHNOLOGIES
- LENGTH: HORIZONTAL SINGLE AXIS TRACKER
- TILT: 0°
- ORIENTATION: E-W +/-52°
- GCR: 33.3%

STRING LENGTH = 27 MODULES IN SERIES
TOTAL STRING COUNT = 1,292

LEGEND

- SWITCH
- JUNCTION BOX
- COMBINER BOX
- TRACKER MOTOR
- GRASSED ACCESS CORRIDOR
- PARCEL BOUNDARY
- FENCE LINE
- GAS LINE
- DELINEATED WETLAND
- ENVIRONMENTALLY SENSITIVE NO ACCESS/GROUND DISTURBANCE
- 1MVA STEP-UP TRANSFORMER
- 2MVA STEP-UP TRANSFORMER
- 3MVA STEP-UP TRANSFORMER
- UNDERGROUND CROSSING
- LOW VOLTAGE AC CABLE
- DC CABLE
- OVERHEAD ELECTRIC LINE
- UNDERGROUND ELECTRIC LINE
- ACCESS ROAD

KEY PLAN – 1"=3000'



NY STATE PLANE
EAST ZONE
NY83-EF – US FEET

NO.	REVISIONS	DATE	BY	CHK	APR

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/19/18	RAA	NM	JAB
B	ISSUED FOR REVIEW	2/22/19	JPD	NJM	JAB
C	ISSUED FOR REVIEW	4/17/19	JPD	NJM	JAB

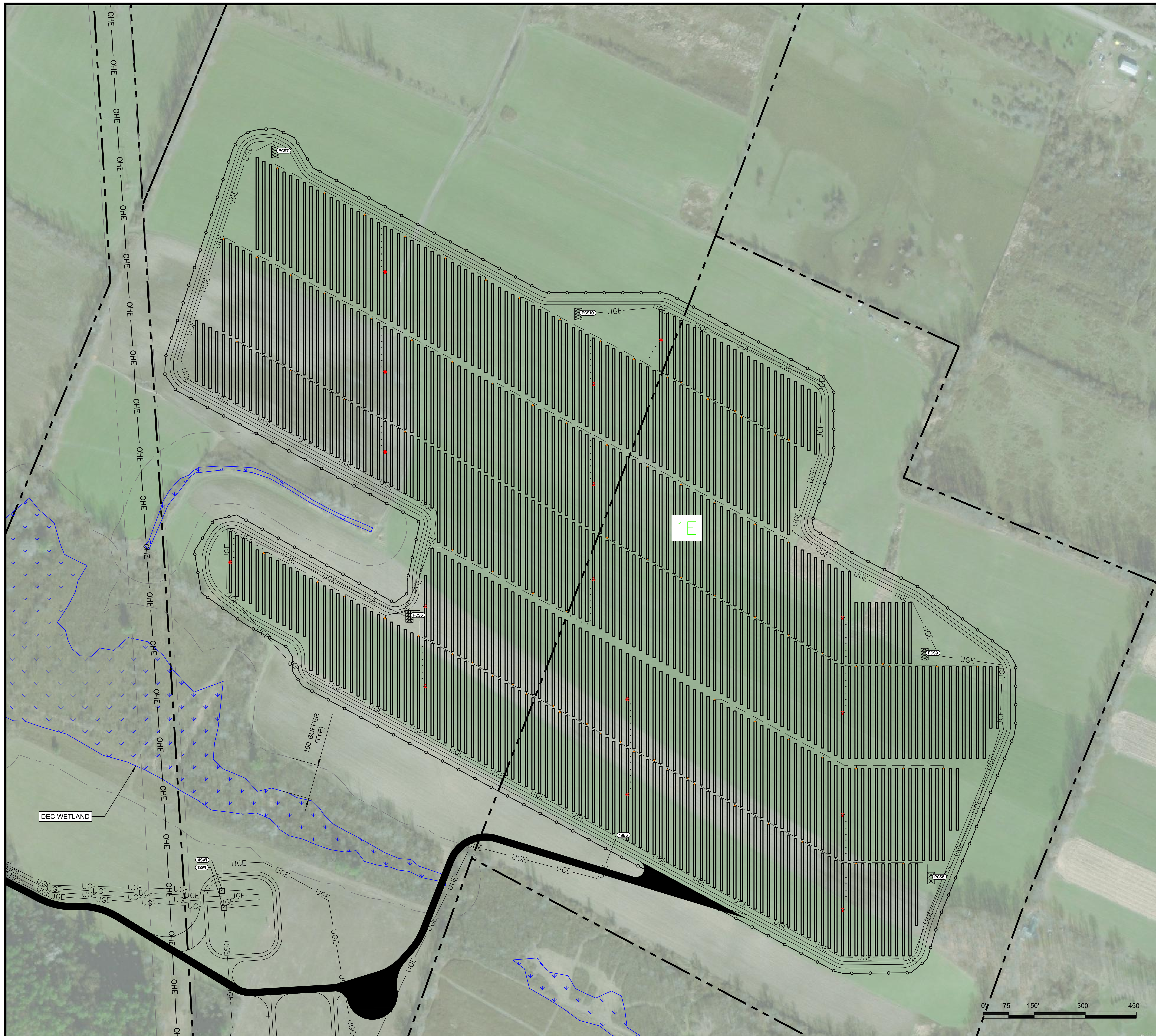
AVANGRID RENEWABLES

MOTT MACDONALD
10415 MORADO CIRCLE
BUILDING 1, SUITE 200
AUSTIN, TX 78759
PHONE 512.342.9516
FAX 512.342.9708

ENGINEERING RECORD	DATE
DRAWN: R. ANSON	12/19/18
DESIGNED: N. MATTHYSSE	12/19/18
CHECKED: J. BERKOW	12/19/18
APPROVED: J. BERKOW	12/19/18

MOHAWK SOLAR
ARRAY PARCEL DETAILS

CADFILE: MHS-E-401-07.dwg | SCALE: 1"=200' | DWG.NO. MHS-E-401-07 | SHEET 7 of 13 | REV C



PROJECT DATA

CAPACITY (AC): 11.48MW / 12.75MVA
CAPACITY (DC): 15.80MWp

PV MODULES:
- MFR: CANADIAN SOLAR
- MODEL: CS3U–360PB–FG
- NAMEPLATE: 360Wp / 405Wp
- QUANTITY: 39,015

INVERTERS:
- MFR: SMA
- MODEL: HIGH POWER PEAK 3
- NAMEPLATE: 135kW / 150kVA
- QUANTITY: 85

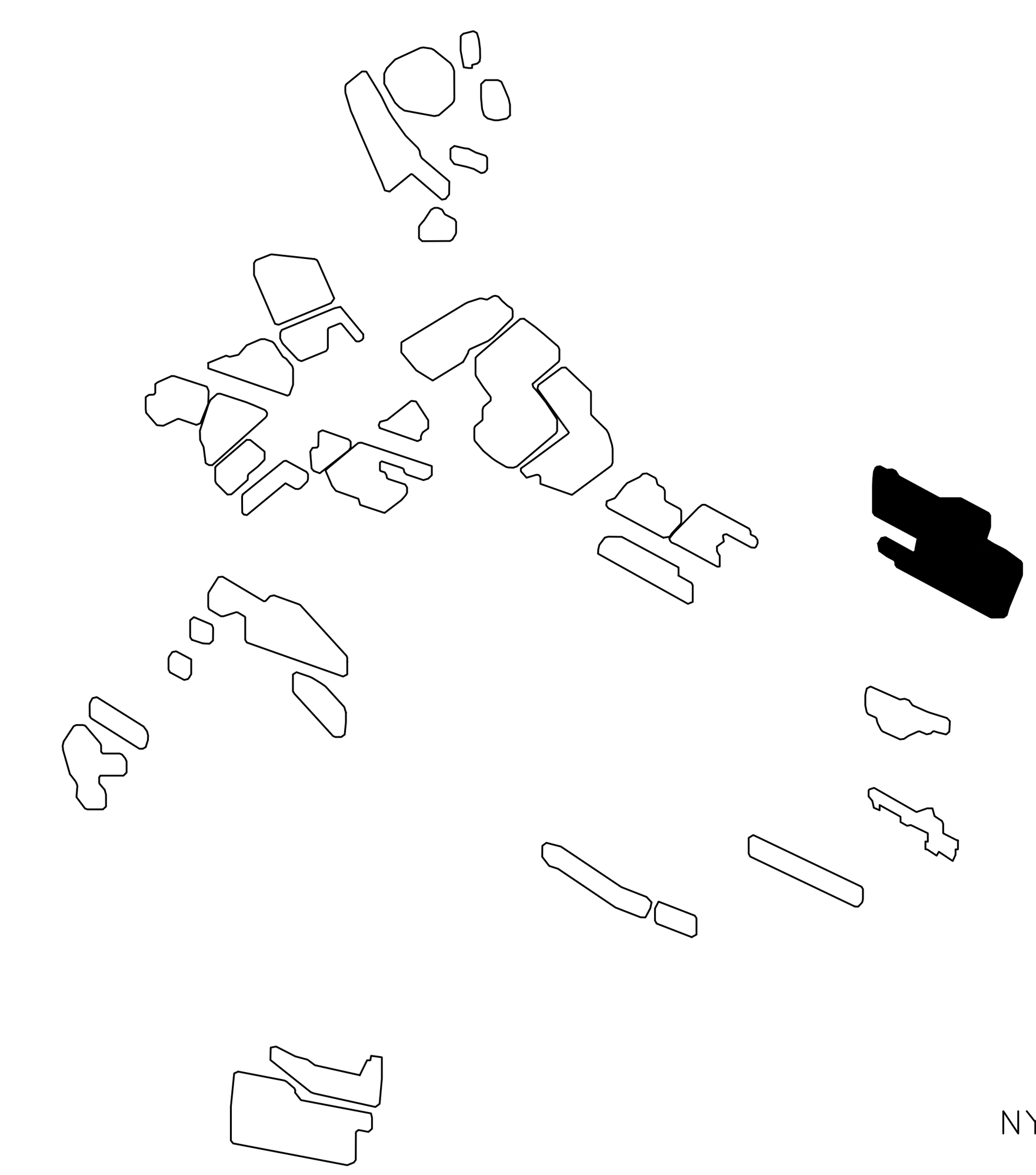
ARRAY:
- MFR: ARRAY TECHNOLOGIES
- LENGTH: HORIZONTAL SINGLE AXIS TRACKER
- TILT: 0°
- ORIENTATION: E–W +/–52°
- GCR: 33.3%

STRING LENGTH = 27 MODULES IN SERIES
TOTAL STRING COUNT = 1,445

LEGEND

(symbol)	SWITCH	(symbol)	1MVA STEP–UP TRANSFORMER
(symbol)	JUNCTION BOX	(symbol)	2MVA STEP–UP TRANSFORMER
(symbol)	COMBINER BOX	(symbol)	3MVA STEP–UP TRANSFORMER
M	TRACKER MOTOR		
(symbol)	GRASSED ACCESS CORRIDOR	(symbol)	UNDERGROUND CROSSING
(symbol)	PARCEL BOUNDARY	(symbol)	LOW VOLTAGE AC CABLE
(symbol)	FENCE LINE	(symbol)	DC CABLE
GAS	GAS LINE	OHE	OVERHEAD ELECTRIC LINE
(symbol)	DELINEATED WETLAND	UGE	UNDERGROUND ELECTRIC LINE
(symbol)	ENVIRONMENTALLY SENSITIVE NO ACCESS/GROUND DISTURBANCE	(symbol)	ACCESS ROAD

KEY PLAN – 1"=3000'



NY STATE PLANE
EAST ZONE
NY83–EF – US FEET

NO.	REVISIONS	DATE	BY	CHK	APR

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/19/18	RAA	NM	JAB
B	ISSUED FOR REVIEW	2/22/19	JPD	NJM	JAB
C	ISSUED FOR REVIEW	4/17/19	JPD	NJM	JAB

AVANGRID RENEWABLES

MOTT MACDONALD
10415 MORADO CIRCLE
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AUSTIN, TX 78759
PHONE 512.342.9516
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ENGINEERING RECORD	DATE
DRAWN: R. ANSON	12/19/18
DESIGNED: N. MATTHYSSE	12/19/18
CHECKED: J. BERKOW	12/19/18
APPROVED: J. BERKOW	12/19/18

MOHAWK SOLAR ARRAY PARCEL DETAILS

CADFILE: MHS–E–401–08.dwg | SCALE: 1"=150' | DWG.NO. MHS–E–401–08 | SHEET 8 of 13 | REV C

PROJECT DATA

CAPACITY (AC): 5.81MW / 6.45MVA
CAPACITY (DC): 7.99MWp

PV MODULES:
- MFR: CANADIAN SOLAR
- MODEL: CS3U-360PB-FG
- NAMEPLATE: 360Wp / 405Wp
- QUANTITY: 19,737

INVERTERS:
- MFR: SMA
- MODEL: HIGH POWER PEAK 3
- NAMEPLATE: 135kW / 150kVA
- QUANTITY: 43

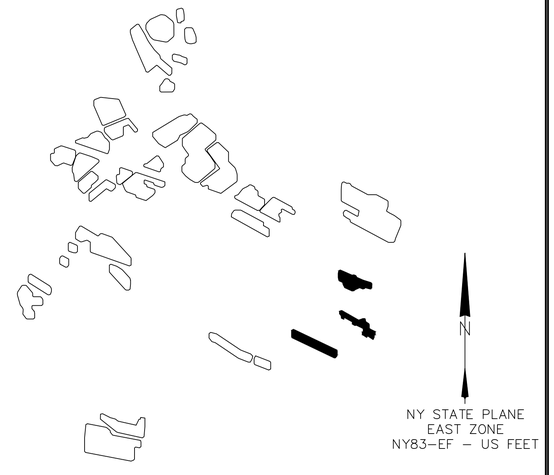
ARRAY:
- MFR: ARRAY TECHNOLOGIES
- LENGTH: HORIZONTAL SINGLE AXIS TRACKER
- TILT: 0°
- ORIENTATION: E-W +/-52°
- GCR: 33.3%

STRING LENGTH = 27 MODULES IN SERIES
TOTAL STRING COUNT = 731

LEGEND

- SWITCH
- JUNCTION BOX
- COMBINER BOX
- TRACKER MOTOR
- GRASSED ACCESS CORRIDOR
- PARCEL BOUNDARY
- FENCE LINE
- GAS LINE
- DELINEATED WETLAND
- ENVIRONMENTALLY SENSITIVE NO ACCESS/GROUND DISTURBANCE
- 1MVA STEP-UP TRANSFORMER
- 2MVA STEP-UP TRANSFORMER
- 3MVA STEP-UP TRANSFORMER
- UNDERGROUND CROSSING
- LOW VOLTAGE AC CABLE
- DC CABLE
- OVERHEAD ELECTRIC LINE
- UNDERGROUND ELECTRIC LINE
- ACCESS ROAD

KEY PLAN – 1"=3000'



NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/19/18	RAA	NM	JAB
B	ISSUED FOR REVIEW	2/22/19	JPD	NJM	JAB
C	ISSUED FOR REVIEW	4/17/19	JPD	NJM	JAB

AVANGRID RENEWABLES

MOTT MACDONALD
10415 MORADO CIRCLE
BUILDING 1, SUITE 200
AUSTIN, TX 78759
PHONE 512.342.9516
FAX 512.342.9708

ENGINEERING RECORD	DATE
DRAWN: R. ANSON	12/19/18
DESIGNED: N. MATTHYSSE	12/19/18
CHECKED: J. BERKOW	12/19/18
APPROVED: J. BERKOW	12/19/18

MOHAWK SOLAR
ARRAY PARCEL DETAILS

CADFILE: MHS-E-401-09.dwg | SCALE: 1"=200' | DWG.NO. MHS-E-401-09 | SHEET 9 of 13 | REV C

PROJECT DATA

CAPACITY (AC): 2.70MW / 3.0MVA
CAPACITY (DC): 3.72MWp

PV MODULES:
- MFR: CANADIAN SOLAR
- MODEL: CS3U-360PB-FG
- NAMEPLATE: 360Wp / 405Wp
- QUANTITY: 9,180

INVERTERS:
- MFR: SMA
- MODEL: HIGH POWER PEAK 3
- NAMEPLATE: 135kW / 150kVA
- QUANTITY: 20

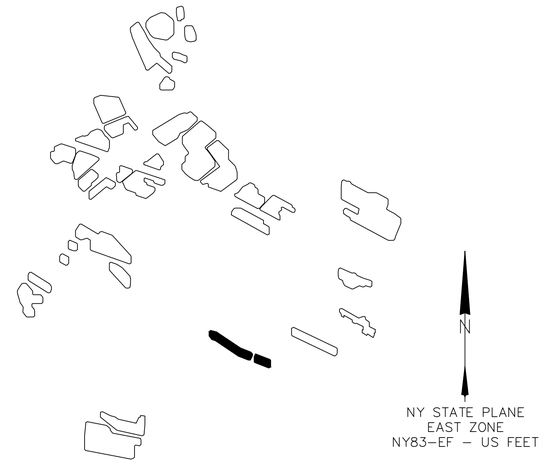
ARRAY:
- MFR: ARRAY TECHNOLOGIES
- LENGTH: HORIZONTAL SINGLE AXIS TRACKER
- TILT: 0°
- ORIENTATION: E-W +/-52°
- GCR: 33.3%

STRING LENGTH = 27 MODULES IN SERIES
TOTAL STRING COUNT = 340

LEGEND

- SWITCH
- JUNCTION BOX
- COMBINER BOX
- TRACKER MOTOR
- GRASSED ACCESS CORRIDOR
- PARCEL BOUNDARY
- FENCE LINE
- GAS LINE
- DELINEATED WETLAND
- ENVIRONMENTALLY SENSITIVE NO ACCESS/GROUND DISTURBANCE
- 1MVA STEP-UP TRANSFORMER
- 2MVA STEP-UP TRANSFORMER
- 3MVA STEP-UP TRANSFORMER
- UNDERGROUND CROSSING
- LOW VOLTAGE AC CABLE
- DC CABLE
- OVERHEAD ELECTRIC LINE
- UNDERGROUND ELECTRIC LINE
- ACCESS ROAD

KEY PLAN – 1"=3000'



NY STATE PLANE
EAST ZONE
NY83-EF – US FEET

NO.	REVISIONS	DATE	BY	CHK	APR

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/19/18	RAA	NM	JAB
B	ISSUED FOR REVIEW	2/22/19	JPD	NJM	JAB
C	ISSUED FOR REVIEW	4/17/19	JPD	NJM	JAB

AVANGRID RENEWABLES

MOTT MACDONALD
10415 MORADO CIRCLE
BUILDING 1, SUITE 200
AUSTIN, TX 78759
PHONE 512.342.9516
FAX 512.342.9708

ENGINEERING RECORD	DATE
DRAWN: R. ANSON	12/19/18
DESIGNED: N. MATTHYSSE	12/19/18
CHECKED: J. BERKOW	12/19/18
APPROVED: J. BERKOW	12/19/18

MOHAWK SOLAR
ARRAY PARCEL DETAILS

CADFILE: MHS-E-401-10.dwg | SCALE: 1"=150' | DWG.NO. MHS-E-401-10 | SHEET10 of 13 | REV C

PROJECT DATA

CAPACITY (AC): 10.94MW / 12.15MVA
CAPACITY (DC): 15.06MWp

PV MODULES:
- MFR: CANADIAN SOLAR
- MODEL: CS3U-360PB-FG
- NAMEPLATE: 360Wp / 405Wp
- QUANTITY: 37,179

INVERTERS:
- MFR: SMA
- MODEL: HIGH POWER PEAK 3
- NAMEPLATE: 135kW / 150kVA
- QUANTITY: 81

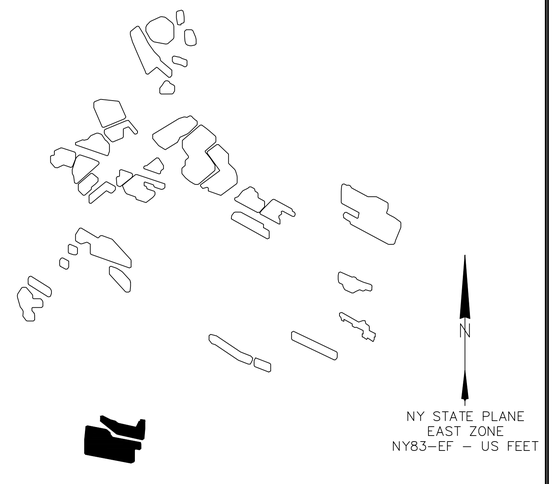
ARRAY:
- MFR: ARRAY TECHNOLOGIES
- LENGTH: HORIZONTAL SINGLE AXIS TRACKER
- TILT: 0°
- ORIENTATION: E-W +/-52°
- GCR: 33.3%

STRING LENGTH = 27 MODULES IN SERIES
TOTAL STRING COUNT = 1,377

LEGEND

- SWITCH
- JUNCTION BOX
- COMBINER BOX
- TRACKER MOTOR
- GRASSED ACCESS CORRIDOR
- PARCEL BOUNDARY
- FENCE LINE
- GAS LINE
- DELINEATED WETLAND
- ENVIRONMENTALLY SENSITIVE NO ACCESS/GROUND DISTURBANCE
- 1MVA STEP-UP TRANSFORMER
- 2MVA STEP-UP TRANSFORMER
- 3MVA STEP-UP TRANSFORMER
- UNDERGROUND CROSSING
- LOW VOLTAGE AC CABLE
- DC CABLE
- OVERHEAD ELECTRIC LINE
- UNDERGROUND ELECTRIC LINE
- ACCESS ROAD

KEY PLAN – 1"=3000'



NY STATE PLANE
EAST ZONE
NY83-EF – US FEET

NO.	REVISIONS	DATE	BY	CHK	APR

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/19/18	RAA	NM	JAB
B	ISSUED FOR REVIEW	2/22/19	JPD	NJM	JAB
C	ISSUED FOR REVIEW	4/17/19	JPD	NJM	JAB

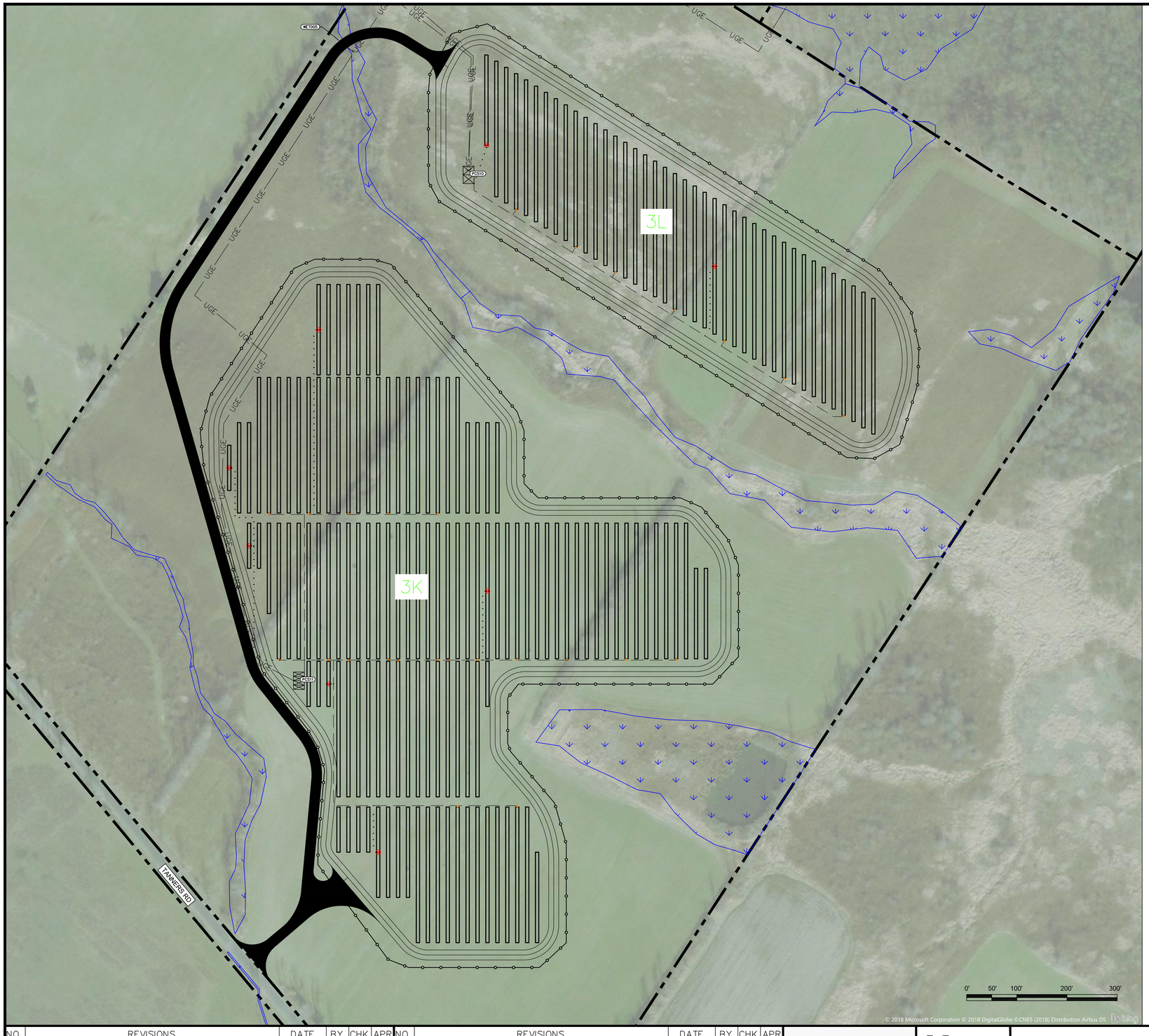
AVANGRID RENEWABLES

MOTT MACDONALD
10415 MORADO CIRCLE
BUILDING 1, SUITE 200
AUSTIN, TX 78759
PHONE 512.342.9516
FAX 512.342.9708

ENGINEERING RECORD	DATE
DRAWN: R. ANSON	12/19/18
DESIGNED: N. MATTHYSSE	12/19/18
CHECKED: J. BERKOW	12/19/18
APPROVED: J. BERKOW	12/19/18

MOHAWK SOLAR
ARRAY PARCEL DETAILS

CADFILE: MHS-E-401-11.dwg | SCALE: 1"=150' | DWG.NO. MHS-E-401-11 | SHEET 11 of 13 | REV C



PROJECT DATA

CAPACITY (AC): 3.51MW / 3.90MVA
CAPACITY (DC): 4.83MWp

PV MODULES:
- MFR: CANADIAN SOLAR
- MODEL: CS3U-360PB-FG
- NAMEPLATE: 360Wp / 405Wp
- QUANTITY: 11,934

INVERTERS:
- MFR: SMA
- MODEL: HIGH POWER PEAK 3
- NAMEPLATE: 135kW / 150kVA
- QUANTITY: 26

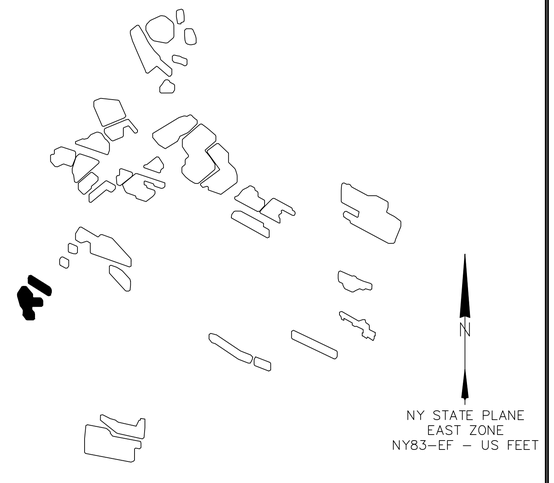
ARRAY:
- MFR: ARRAY TECHNOLOGIES
- LENGTH: HORIZONTAL SINGLE AXIS TRACKER
- TILT: 0°
- ORIENTATION: E-W +/-52°
- GCR: 33.3%

STRING LENGTH = 27 MODULES IN SERIES
TOTAL STRING COUNT = 442

LEGEND

- SWITCH
- JUNCTION BOX
- COMBINER BOX
- TRACKER MOTOR
- GRASSED ACCESS CORRIDOR
- PARCEL BOUNDARY
- FENCE LINE
- GAS LINE
- DELINEATED WETLAND
- ENVIRONMENTALLY SENSITIVE NO ACCESS/GROUND DISTURBANCE
- 1MVA STEP-UP TRANSFORMER
- 2MVA STEP-UP TRANSFORMER
- 3MVA STEP-UP TRANSFORMER
- UNDERGROUND CROSSING
- LOW VOLTAGE AC CABLE
- DC CABLE
- OVERHEAD ELECTRIC LINE
- UNDERGROUND ELECTRIC LINE
- ACCESS ROAD

KEY PLAN – 1"=3000'



NY STATE PLANE
EAST ZONE
NY83-EF – US FEET

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/19/18	RAA	NM	JAB
B	ISSUED FOR REVIEW	2/22/19	JPD	NJM	JAB
C	ISSUED FOR REVIEW	4/17/19	JPD	NJM	JAB

AVANGRID RENEWABLES

MOTT MACDONALD
10415 MORADO CIRCLE
BUILDING 1, SUITE 200
AUSTIN, TX 78759
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FAX 512.342.9708

ENGINEERING RECORD	DATE
DRAWN: R. ANSON	12/19/18
DESIGNED: N. MATTHYSSE	12/19/18
CHECKED: J. BERKOW	12/19/18
APPROVED: J. BERKOW	12/19/18

MOHAWK SOLAR
ARRAY PARCEL DETAILS

CADFILE: MHS-E-401-12.dwg | SCALE: 1"=100' | DWG.NO. MHS-E-401-12 | SHEET 12 of 13 | REV C

PROJECT DATA

CAPACITY (AC): 7.02MW / 7.80MVA
CAPACITY (DC): 9.79MWp

PV MODULES:
- MFR: CANADIAN SOLAR
- MODEL: CS3U-360PB-FG
- NAMEPLATE: 360Wp / 405Wp
- QUANTITY: 24,165

INVERTERS:
- MFR: SMA
- MODEL: HIGH POWER PEAK 3
- NAMEPLATE: 135kW / 150kVA
- QUANTITY: 52

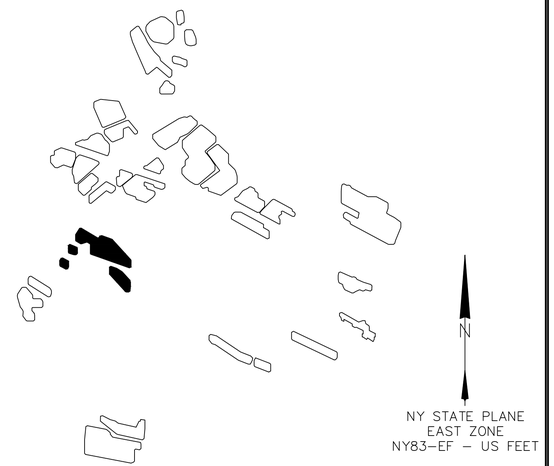
ARRAY:
- MFR: ARRAY TECHNOLOGIES
- LENGTH: HORIZONTAL SINGLE AXIS TRACKER
- TILT: 0°
- ORIENTATION: E-W +/-52°
- GCR: 33.3%

STRING LENGTH = 27 MODULES IN SERIES
TOTAL STRING COUNT = 895

LEGEND

- SWITCH
- JUNCTION BOX
- COMBINER BOX
- TRACKER MOTOR
- GRASSED ACCESS CORRIDOR
- PARCEL BOUNDARY
- FENCE LINE
- GAS LINE
- DELINEATED WETLAND
- ENVIRONMENTALLY SENSITIVE NO ACCESS/GROUND DISTURBANCE
- 1MVA STEP-UP TRANSFORMER
- 2MVA STEP-UP TRANSFORMER
- 3MVA STEP-UP TRANSFORMER
- UNDERGROUND CROSSING
- LOW VOLTAGE AC CABLE
- DC CABLE
- OVERHEAD ELECTRIC LINE
- UNDERGROUND ELECTRIC LINE
- ACCESS ROAD

KEY PLAN – 1"=3000'



NY STATE PLANE
EAST ZONE
NY83-EF – US FEET

NO.	REVISIONS	DATE	BY	CHK	APR

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/19/18	RAA	NM	JAB
B	ISSUED FOR REVIEW	2/22/19	JPD	NJM	JAB
C	ISSUED FOR REVIEW	4/17/19	JPD	NJM	JAB

AVANGRID RENEWABLES

MOTT MACDONALD
10415 MORADO CIRCLE
BUILDING 1, SUITE 200
AUSTIN, TX 78759
PHONE 512.342.9516
FAX 512.342.9708

ENGINEERING RECORD	DATE
DRAWN: R. ANSON	12/19/18
DESIGNED: N. MATTHYSSE	12/19/18
CHECKED: J. BERKOW	12/19/18
APPROVED: J. BERKOW	12/19/18

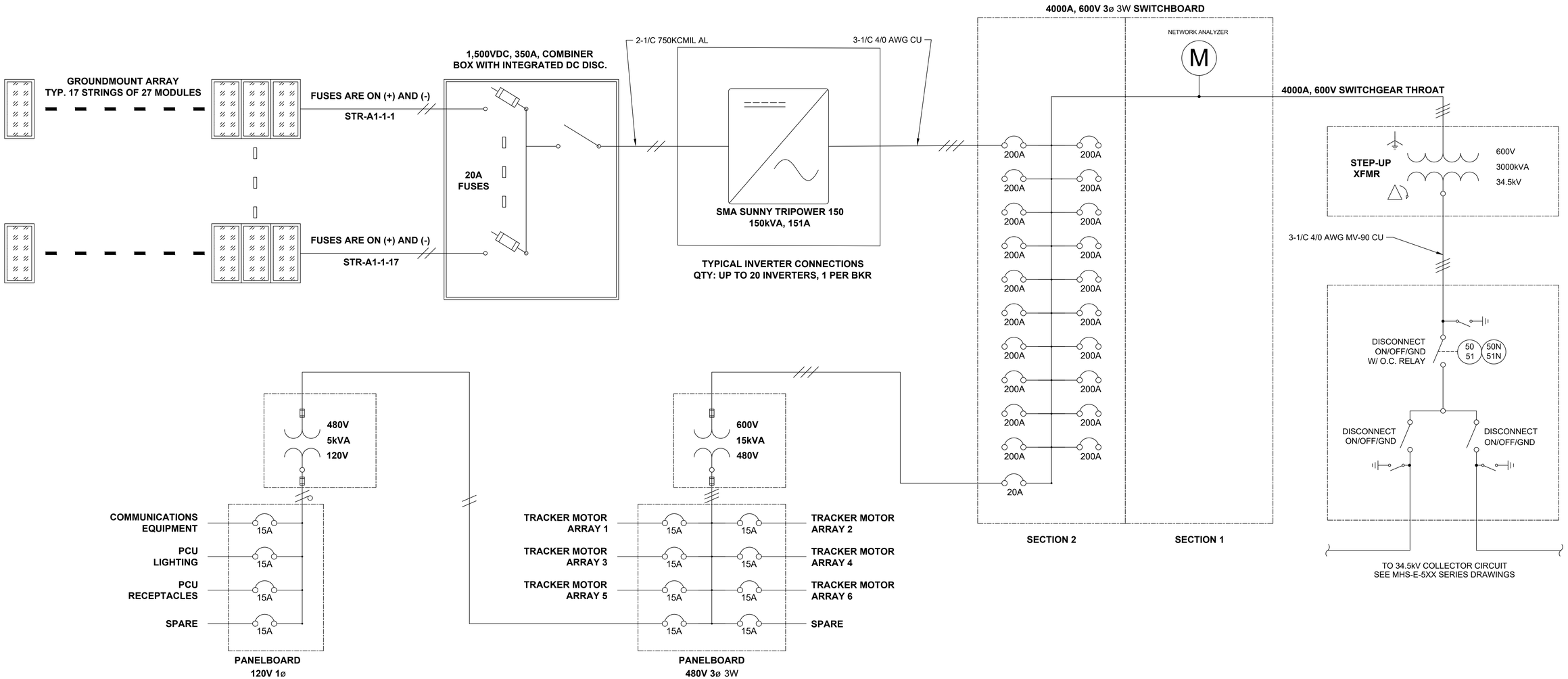
MOHAWK SOLAR
ARRAY PARCEL DETAILS

CADFILE: MHS-E-401-13.dwg | SCALE: 1"=150' | DWG.NO. MHS-E-401-13 | SHEET 13 of 13 | REV C

GENERAL NOTES:

1. EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE TO NEC 690.46 AND 690.47.
2. ELECTRICAL EQUIPMENT MUST BE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS.
3. CONDUCTORS IN CONDUIT AND CONDUIT FITTINGS INSTALLED OUTDOORS MUST BE LISTED FOR USE IN WET LOCATIONS.
4. GROUNDING TERMINALS AND HARDWARE INSTALLED OUTDOORS SHALL BE CORROSION RESISTANT.
5. DRAWING IDENTIFIES 20 INVERTER LAYOUT WITH 3MVA TRANSFORMER, SOME ARRANGEMENTS WILL INCLUDE A SMALLER TRANSFORMER AND FEWER INVERTERS. SEE LAYOUT DRAWINGS FOR INVERTER QUANTITIES AND TRANSFORMER SIZES.

INVERTER SUMMARY		
TRANSFORMER SIZE	MAX INVERTER QUANTITY	SWITCHBOARD AMPACITY
3 MVA	UP TO 20	4000A
2 MVA	UP TO 13	2500A
1 MVA	UP TO 6	1200A



NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/05/18	PL	NM	–
B	ISSUED FOR REVIEW	2/22/19	JPD	NJM	JAB

AVANGRID RENEWABLES

MOTT MACDONALD
10415 MORADO CIRCLE
BUILDING 1, SUITE 200
AUSTIN, TX 78759
PHONE 512.342.9516
FAX 512.342.9708

ENGINEERING RECORD	DATE
DRAWN: P. LOTFI	11/01/18
DESIGNED: N. MATTHYSSE	11/01/18
CHECKED: J. BERKOW	12/05/18
APPROVED: J. BERKOW	12/05/18
CADFILE: MHS-E-402-01.dwg	

MOHAWK SOLAR PROJECT
TYPICAL DC ONE LINE

SCALE:NONE | DWG.NO. MHS-E-402-01 | SHEET 1 OF 1 | REV B

DESIGN SPECIFICATIONS

DESIGN SPECIFICATIONS FOR EQUIPMENT WITHIN THIS DESIGN PACKAGE

ITEM	UNITS	NOTES
MOUNTING MANUFACTURER	ARRAY TECHNOLOGIES - DURATRACK HZ V3	
MOUNTING TYPE	SINGLE AXIS TRACKER	+/- 52° WITH BACK-TRACKING
ARRAY AZIMMUTH	EAST - WEST TRACKING	
MODULE MANUFACTURER	CANADIAN SOLAR CS3U-360PB-FG	360Wp (FRONT) / 405Wp (TOTAL)
MODULE TYPE	POLY c-Si	BI-FACIAL
INVERTER NAMEPLATE CAPACITY	150KVA @ 25°C	DE-RATED CAPACITY OF 135KW @ 25°C
AC NAMEPLATE	95.18 MWAC @ STC	DE-RATED TO 90.5MWAC @ POI
MINIMUM TEMPERATURE (DESIGN)	-24.3°C	DC SYSTEM VOLTAGE < 1500V FOR TEMPERATURE
MAXIMUM TEMPERATURE (DESIGN)	40°C	OUTDOOR EQUIPMENT RATED FOR OPERATION UP TO 50°C

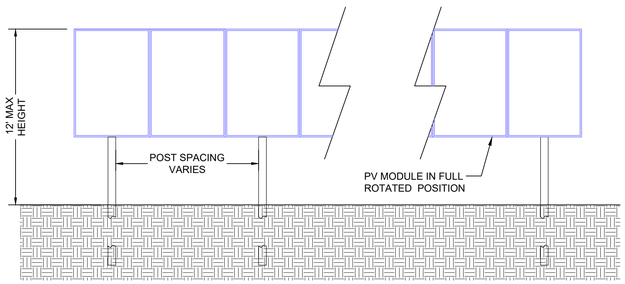
GENERAL NOTES

1. FOLLOW AND ADHERE TO ALL MANUFACTURERS INSTALLATION INSTRUCTIONS.
2. ALL BACKFILL AND COMPACTION SHALL COMPLY WITH GEOTECH REPORT.
3. LINE AND LOAD CONDUCTORS SHALL BE BRACED AND SUPPORTED (LASHED, HELD FIRMLY IN PLACE) IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S SPECIFICATIONS AND APPROVED INSTALLATION PRACTICES.
4. PLASTIC CABLE TIES AND FIXINGS NOT TO BE USED AS PRIMARY CABLE SUPPORT WHERE EXPOSED TO UV,
5. PROVIDE PHENOLIC NAMEPLATE WITH WHITE LETTERING ON BLACK BACKGROUND FOR EACH ELECTRICAL EQUIPMENT. PROVIDE PERMANENT MEANS OF ATTACHMENT THAT WILL NOT VIOLATE EQUIPMENT RATING OR EQUIPMENT WARRANTY.
6. REFER TO THE DRAWINGS FOR LOCATIONS AND SPACE REQUIREMENTS OF ELECTRICAL EQUIPMENT.
7. ELECTRICAL CONSTRUCTOR SHALL PROVIDE COMPLETE ELECTRICAL INSTALLATION IN ACCORDANCE WITH ESTABLISHED TECHNIQUES AND ACCEPTED PRACTICES AND ALL LOCAL, AND NATIONAL CODES.
8. ALL CONDUCTORS SHALL BE ALUMINUM OR COPPER STRANDED, AND HAVE INSULATION TEMPERATURE RATING NOT LESS THAN 90°C, UNLESS OTHERWISE NOTED.
9. CONDUCTOR COLOR CODES SHALL MEET THE NATIONAL ELECTRIC CODE (NEC).

APPLICABLE CODES

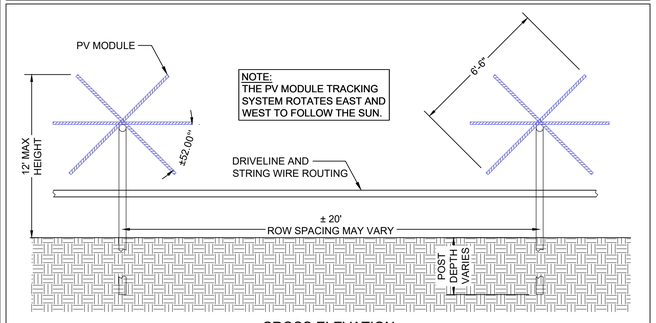
CURRENT ADDITION AT TIME OF CONSTRUCTION:

- AMERICAN CONCRETE INSTITUTE (ACI)
- AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
- AMERICAN SOCIETY FOR CIVIL ENGINEERS (ASCE)
- AMERICAN SOCIETY FOR MECHANICAL ENGINEERS (ASME)
- AMERICAN SOCIETY FOR NON-DESTRUCTIVE TESTING (ASNT)
- AMERICAN SOCIETY FOR TESTING MATERIALS (ASTM)
- AMERICAN WELDING SOCIETY (AWS)
- INSTITUTION OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE)
- INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)
- NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY(NIST)
- NATIONAL ELECTRIC CODE (NEC)
- NATIONAL ELECTRIC MANUFACTURERS ASSOCIATION (NEMA)
- NATIONAL ELECTRIC SAFETY CODE (NESC)
- NATIONAL ELECTRIC TESTING ASSOCIATION (NETA)
- NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
- OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)



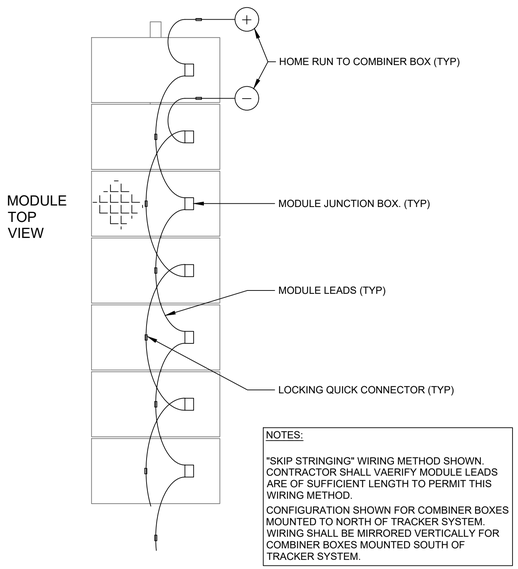
FRONT ELEVATION

1 --- TRACKER RACK ELEVATION DETAIL (NOT TO SCALE)

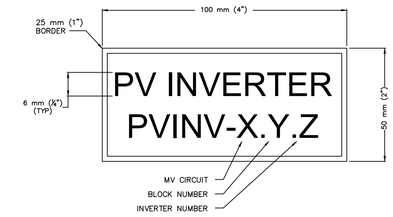


CROSS ELEVATION

2 --- TRACKER RACK SECTION DETAIL (NOT TO SCALE)



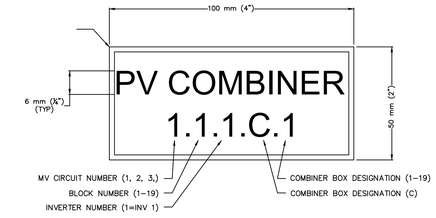
3 --- MODULE SKIP WIRING DETAIL (NOT TO SCALE)



INVERTER LABEL NOTE:

1. TO BE MOUNTED TO ALL PV INVERTERS WITH RESPECTIVE NOMENCLATURE.

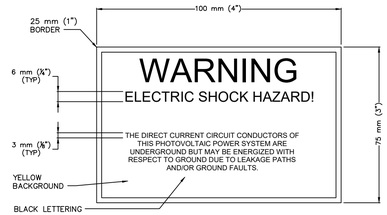
INVERTER LABEL
SCALE: NTS



PV STRING COMBINER LABEL NOTE:

1. TO BE MOUNTED TO EACH PV STRING COMBINER BOX WITH RESPECTIVE NOMENCLATURE.

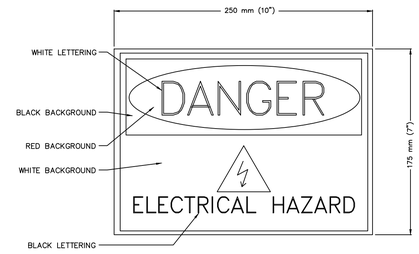
COMBINER NAMEPLATE
SCALE: NTS



DC WARNING LABEL NOTES:

1. TO BE MOUNTED ON ALL JUNCTION BOXES, COMBINER BOXES, DISCONNECTS AND DEVICES WHERE UNDERGROUND CIRCUITS MAY BE EXPOSED DURING SERVICE.
2. TEXT HEIGHT TO BE THE SAME AS FOR DC DISCONNECT LABEL.

INVERTER GROUND-FAULT WARNING
SCALE: NTS



1. SIGN SHALL BE 250 mm (10") x 175 mm (7") x 1 mm (0.04") THICK (MIN.) ALUMINUM SHEET.

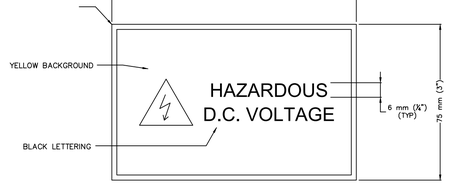
PV STRUCTURE/FENCE WARNING SIGN
SCALE: NTS

WARNING: PHOTOVOLTAIC POWER SOURCE

NOTES:

1. RED BACKGROUND WHITE LETTERING
2. MINIMUM 3/8" LETTER HEIGHT
3. ARIAL OR SIMILAR FONT, NON-BOLD
4. REFLECTIVE, WEATHER RESISTANT MATERIAL SUITABLE FOR THE ENVIRONMENT (DURABLE ADHESIVE MATERIALS MAY MEET THIS REQUIREMENT)

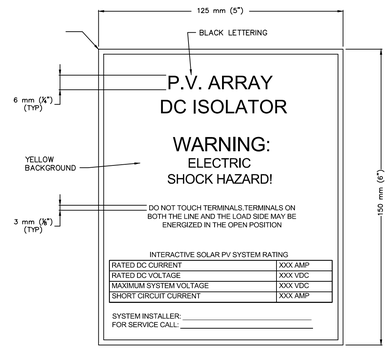
MARKING FOR DC RACEWAYS, ENCLOSURES CABLE ASSEMBLIES AND JUNCTION BOXES
SCALE: NTS



PV ARRAY AND PV STRING JUNCTION BOX LABEL NOTES:

1. TO BE MOUNTED ON ALL PV ARRAYS AND STRING JUNCTION BOXES.

PV ARRAY AND PV STRING JUNCTION BOXES
SCALE: NTS



DC COMBINER BOX WARNING LABEL NOTES:

1. TO BE MOUNTED ON EACH STRING PV COMBINER BOX.
2. TEXT HEIGHTS SHALL BE THE SAME AS FOR THE DISCONNECT LABEL.

COMBINER BOX LABEL
SCALE: NTS

NOTES:

1. TOP OF SIGN TEXT 125 mm (5") MIN CLEAR SPACE FROM GATE OR DOOR JAMB (STRIKE SIDE).
2. PROVIDE A BLANK PANEL FOR BACK SIDE.
3. CONTRAST BETWEEN CHARACTER, SYMBOLS AND THEIR BACKGROUND SHALL BE 70% MINIMUM AND HAVE A NON-GLARE FINISH.
4. CHARACTERS SHALL HAVE A WIDTH-TO-HEIGHT RATIO OF BETWEEN 3:5 AND 1:1 AND A STROKE WIDTH-TO-HEIGHT RATIO OF BETWEEN 1:5 AND 1:10.
5. SIGN SHALL BE 1 mm (0.04") THK (MIN) ALUMINUM SHEET.
6. RAISED UPPERCASE LETTER 1 mm (1/32") TALL, MIN.

AUTHORIZED PERSONNEL SIGNAGE
SCALE: NTS

4 --- SIGNAGE DETAILS (NOT TO SCALE)

NO.	REVISIONS	DATE	BY	CHK	APR

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/05/18	PL	NM	–
B	ISSUED FOR REVIEW	2/22/19	JPD	NJM	JAB

AVANGRID RENEWABLES

MOTT MACDONALD
10415 MORADO CIRCLE
BUILDING 1, SUITE 200
AUSTIN, TX 78759
PHONE 512.342.9516
FAX 512.342.9708

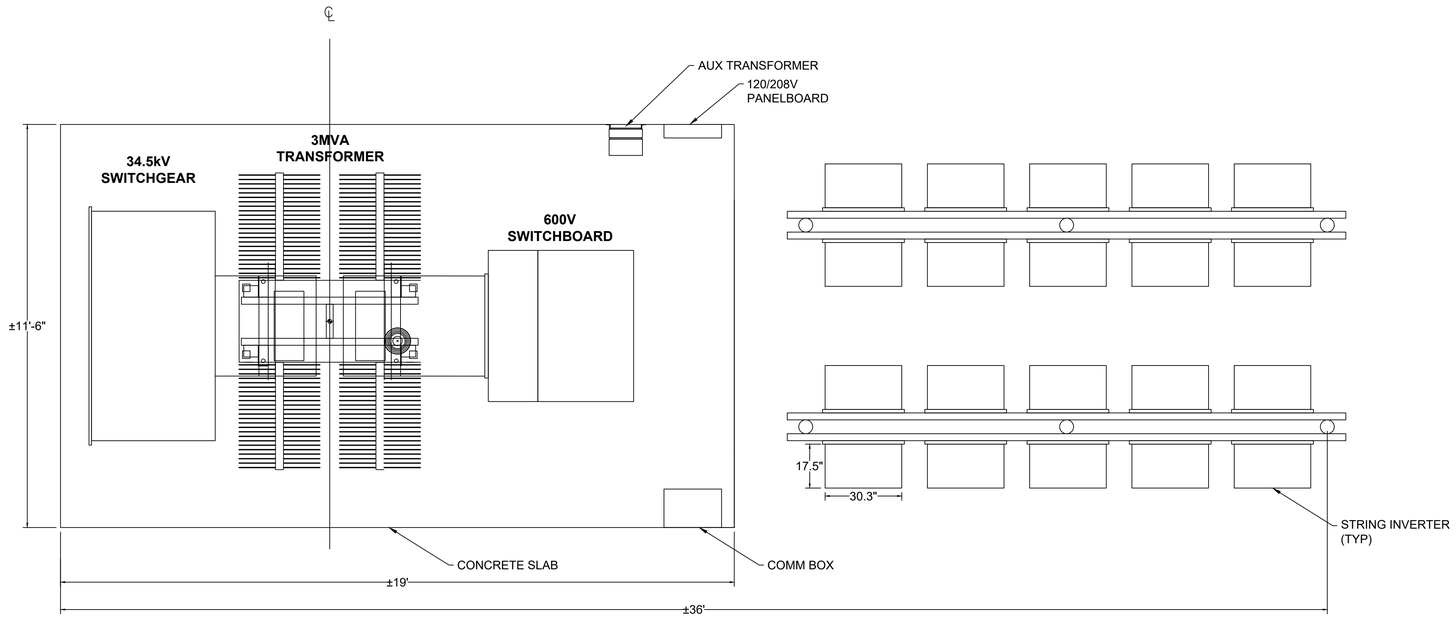
ENGINEERING RECORD	DATE
DRAWN: P. LOTFI	11/01/18
DESIGNED: N. MATTHYSSE	11/01/18
CHECKED: J. BERKOW	12/05/18
APPROVED: J. BERKOW	12/05/18

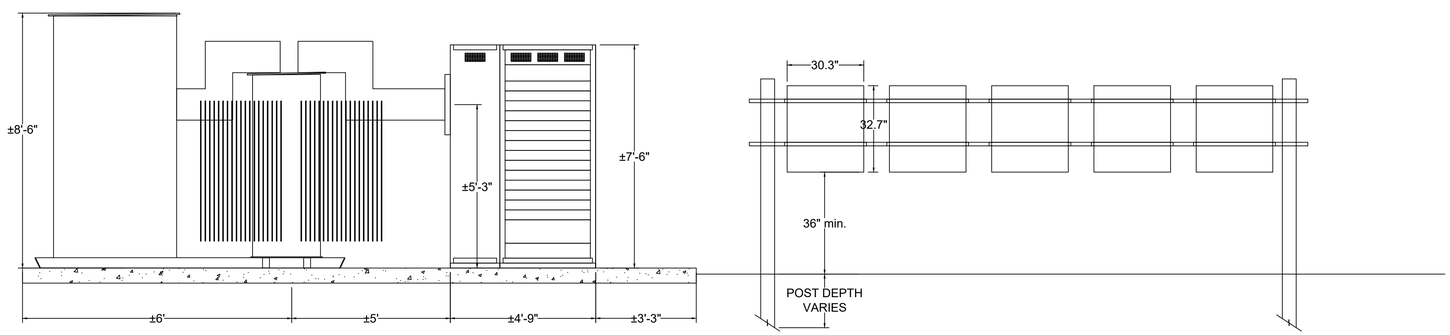
MOHAWK SOLAR PROJECT
PV TYPICALS

CADFILE: MHS-E-403-01.dwg | SCALE:NONE | DWG.NO.MHS-E-403-01 | SHEET 1 OF 1 | REV B

GENERAL NOTES:

1. ELECTRICAL EQUIPMENT MUST BE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS.
2. DRAWING IDENTIFIES 20 INVERTER LAYOUT WITH 3MVA TRANSFORMER, SOME ARRANGEMENTS WILL INCLUDE A SMALLER TRANSFORMER AND FEWER INVERTERS. SEE LAYOUT DRAWINGS FOR INVERTER QUANTITIES AND TRANSFORMER SIZES.





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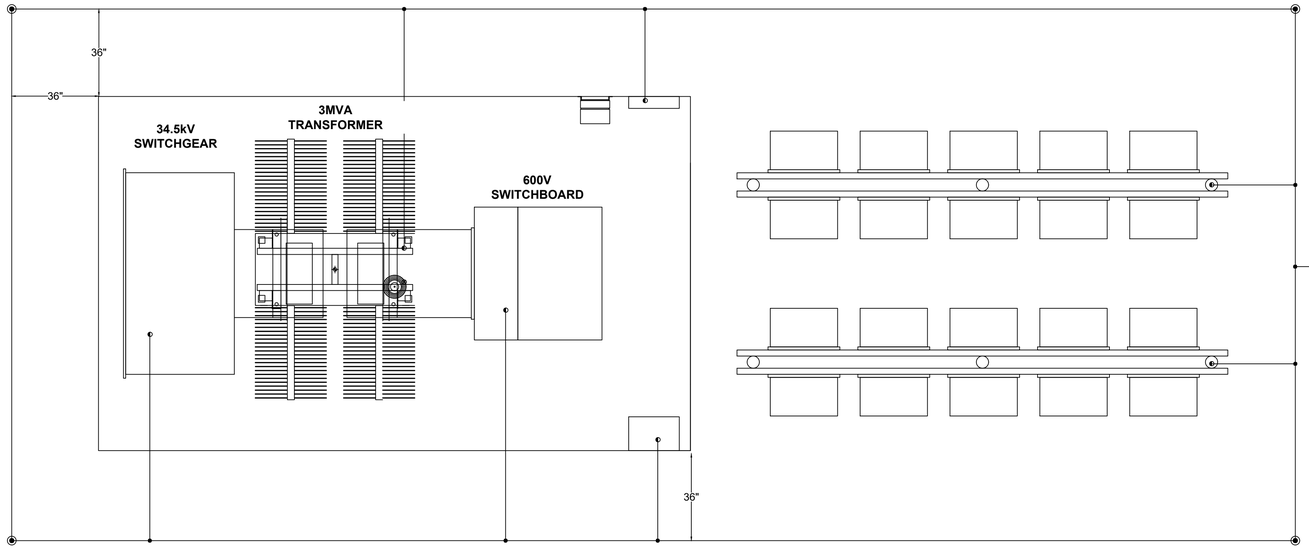
CADFILE: MHS–E–404–01.dwg	

MOHAWK SOLAR PROJECT
TRANSFORMER STATION
SECTIONS AND ELEVATIONS

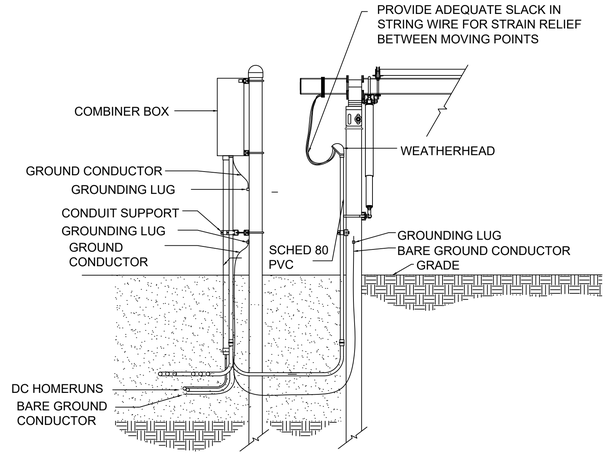
SCALE:NONE	DWG.NO.MHS-E-404-01	SHEET 1 OF 1	REV B

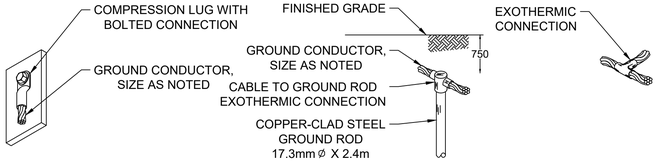


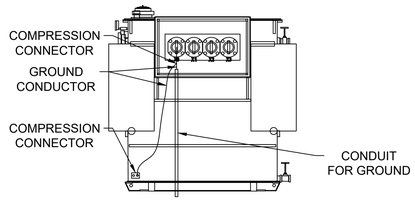
GENERAL NOTES:

1. INVERTER GROUND WIRES TO BE TERMINATED ON GROUND BUS IN SWITCHBOARD.
2. EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH NEC SECTION 250.
3. DRAWING IDENTIFIES 20 INVERTER LAYOUT WITH 3MVA TRANSFORMER, SOME ARRANGEMENTS WILL INCLUDE A SMALLER TRANSFORMER AND FEWER INVERTERS. SEE LAYOUT DRAWINGS FOR INVERTER QUANTITIES AND TRANSFORMER SIZES.
4. GROUND CONDUCTOR SHALL BE RAN WITH DC HOME-RUNS FROM COMBINER BOXES TO INVERTERS. GROUND WIRE SHALL ALSO CONNECT TO EACH PILE FOR ARRAY BONDING, SEE DETAIL E BELOW.

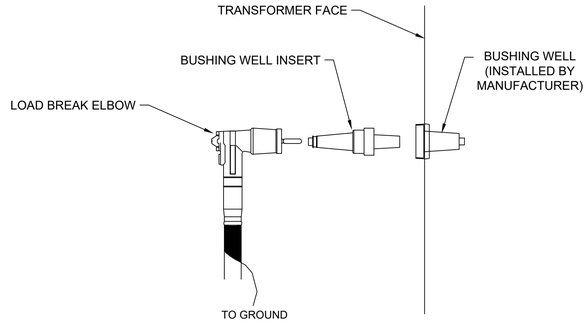
LEGEND	
SYMBOL	DESCRIPTION
◉	GROUND ROD (2.4m)
•	EXOTHERMIC CONNECTION, APPROVED FOR GROUNDING
◐	COMPRESSION CONNECTOR, APPROVED FOR GROUNDING
———	2/0 AWG BARE COPPER WIRE







TO GROUND LOOP VIA 1" CONDUIT



BILL OF MATERIAL		
PART NUMBER	MANUFACTURER	DESCRIPTION
LBI225X	EATON	200A LOAD BREAK BUSHING INSERT
LEJ225DD08GSX	EATON	200A LOAD BREAK ELBOW WITH JACKET SEAL AND GROUND STRAP

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AVANGRID RENEWABLES

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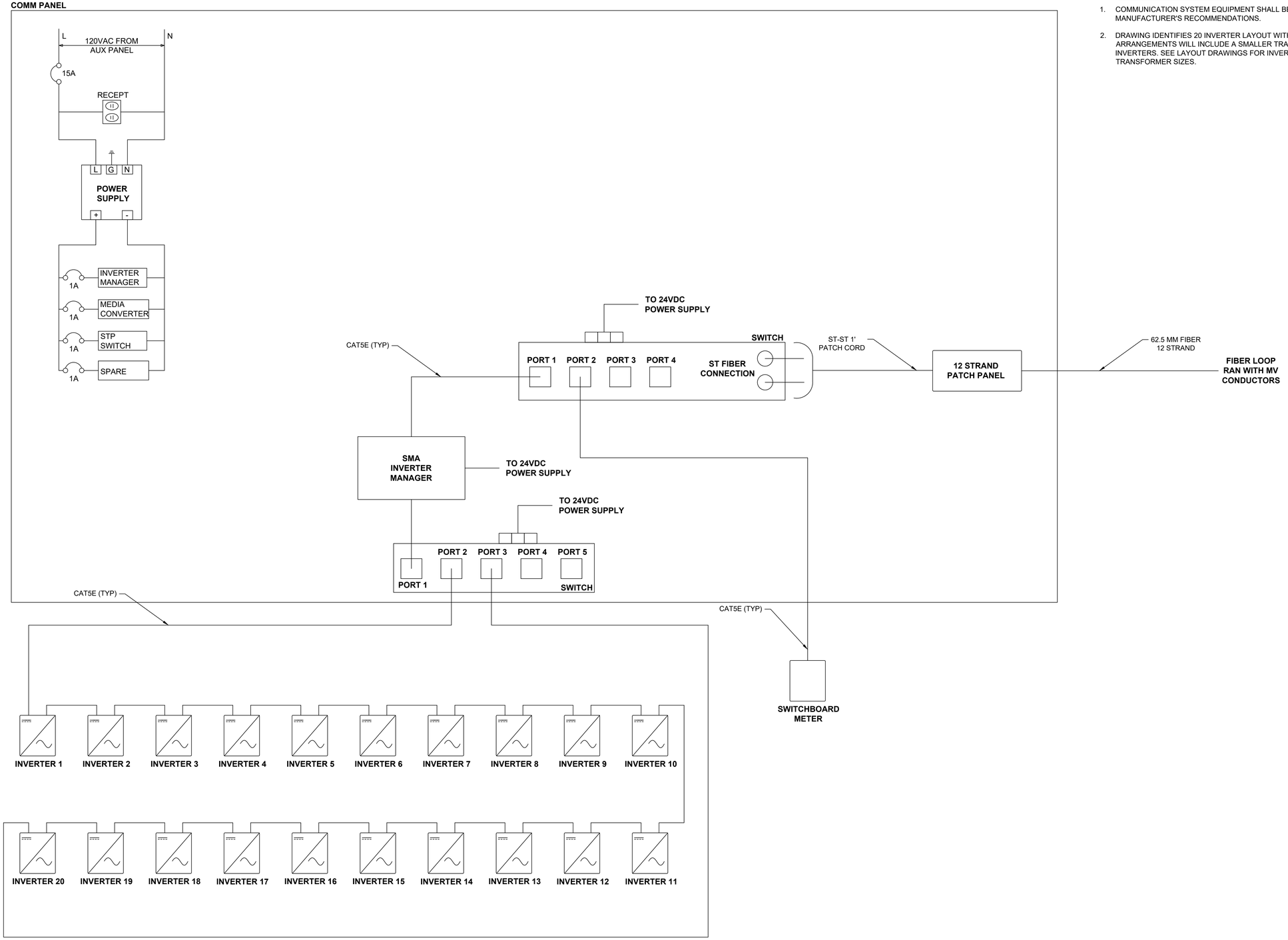
MOHAWK SOLAR PROJECT
GROUNDING DETAIL

CADFILE: MHS-E-405-01.dwg | SCALE:NONE | DWG.NO.MHS-E-405-01 | SHEET 1 OF 1 | REV B

GENERAL NOTES:

1. COMMUNICATION SYSTEM EQUIPMENT SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS.
2. DRAWING IDENTIFIES 20 INVERTER LAYOUT WITH 3MVA TRANSFORMER, SOME ARRANGEMENTS WILL INCLUDE A SMALLER TRANSFORMER AND FEWER INVERTERS. SEE LAYOUT DRAWINGS FOR INVERTER QUANTITIES AND TRANSFORMER SIZES.



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CADFILE: MHS-E-406-01.dwg

MOHAWK SOLAR PROJECT
COMMUNICATION DIAGRAM

SCALE:NONE | DWG.NO.MHS-E-406-01 | SHEET 1 OF 1 | REV B

Technical data sheet

Secondary Skid Unit (SSU)
Solar Power Collection application

Secondary Skid Unit (SSU)

A Secondary Skid Unit (SSU) is an assembly comprising of MV switchgear and a transformer packaged for power collection in solar generating plants. The SSU is the power collection unit which converts the solar energy generated by the solar panels into a usable grid voltage. The SSU is a plug-and-play solution usually installed as close to the solar strings as possible, enabling solar power to be easily and rapidly connected to the electrical grid.

Features

- Simple and quick installation – pre-test units at the factory, drop in place and connect cables
- Pre-engineered products to reduce time to quote and supply, while reducing risks
- Engineered for efficient cooling in order to extend the life of the equipment
- All ABB designs are green to support the environment
- No exposed live parts, more safe for operator and personnel
- SCADA ready
- All equipment contained in the solar modules are type tested according to their relevant standards
- Easy access to equipment for visual inspection and service
- Open-air cooling for maximum efficiency
- Compact and easily transportable
- Economic solution
- Locking system for MV compartment to prevent unauthorized entry

Transformer

The SSU is designed and manufactured to be installed with liquid filled or dry type transformers. The transformer can be provided with alarm and trip contacts for temperature and gas pressure.

Medium voltage

The SSU can be provided with different options of medium voltage switchgear from ABB's SF6 or air insulated switchgear portfolio. The MV switchgear can be provided with SF6 gas alarm, switch position contacts, plug-in MV surge arresters or auto reclosing functions.

Low voltage

The low voltage protection is included in the inverter equipment. LV cables are directly connected to the transformer LV bushing.

Smart Grid

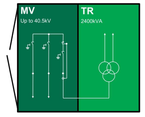
- Smart grid ready for easy connection to any SCADA system through any standard communication protocols
- Remote Terminal Unit (RTU) to monitor the SSU and store data for operation, maintenance and fault analysis
- Local and remote monitoring commands available
- Smart grid compatibility provides supervision and operation of substations from a central office by utilizing end user communication and infrastructure and ABB Station automation device

Pre-engineered solution technical data

Pre-designed solutions are available for optimized designs and quicker delivery. Power ratings are aligned with the most common inverter power ratings. The solutions are equipped with medium voltage switchgear SafeRing CCV configuration (cable loop with breaker and relay protection). The transformer includes standard integrated protection for pressure and gas (RIS). Product datasheets are available with an overview of other options available. Pre-designed solutions for Power Collection are shown below:

Style number	SSU-S-1510-0CCV-4000	SSU-S-2410-0CCV-3000	SSU-S-2410-0CCV-4000	SSU-S-2410-0CCV-2000
Enclosure type	Skid	Skid	Skid	Skid
Overall parameters				
Length x Width x Height, mm	3400 x 2550 x 2800	3400 x 2550 x 2800	3400 x 2550 x 2800	3400 x 2550 x 2800
Approximate weight (metric tons)	8	9.5	9	9
MV switchgear				
Switchgear type	SafeRing CCV	SafeRing CCV	SafeRing CCV	SafeRing CCV
Protection Relay	REJ603	REJ603	REJ603	REJ603
Transformer				
Transformer type	oil immersed	oil immersed	oil immersed	oil immersed
Power rating, kVA	1500	2400	2400	2400
LV Voltage level, V	300 to 400	300 to 400	300 to 400	300 to 400
MV Voltage level, kV max	13.8	40.5	13.8	24
Standard protection	RIS	RIS	RIS	RIS

Single line diagram/layout (without inverter)



General technical data

Nominal output voltage range	6 kV to 40.5 kV
Ambient temperature range	-25 °C to +40 °C
Relative humidity, non-condensing	95%
Max altitude above sea level w/out derating	1000m
Corrosion class (ISO 12944-2)	C5M
IP rating	IP44

For more information please contact:

E-Mail: get.ph@ph.abb.com

www.abb.com/mediumvoltage
www.abb.com/medium-voltage/by-customer-segment/solar

Power and productivity for a better world™ ABB

Power and productivity for a better world™ ABB

SUNNY HIGHPOWER PEAK3 125-US / 150-US

SMA

Cost effective
- Modular architecture reduces BOS and maximizes system uptime
- Compact design and high power density maximize transportation and logistical efficiency

Maximum flexibility
- Scalable 1,500 VDC building block with best-in-class performance
- Flexible architecture creates scalability while maximizing land usage

Simple install, commissioning
- Ergonomic handling and simple connections enable quick installation
- Centralized commissioning and control with SMA Data Manager

Highly innovative
- 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

A superior modular solution for utility power plants

The new Sunny Highpower PEAK3 is SMA's latest addition to a comprehensive portfolio of utility solutions. This 1,500 VDC inverter offers high power density in a modular architecture that achieves a cost-optimized solution for utility-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 utility system solution is powered by the ennexOS cross sector energy management platform, 2018 winner of the Intersolar smarter E AWARD.

Technical Data *	Sunny Highpower PEAK3 125-US	Sunny Highpower PEAK3 150-US
Input (DC)		
Maximum array power	187500 Wp STC	225000 Wp STC
Maximum system voltage	1500 VDC	
MPP voltage range	710 V ... 1425 V	855 V ... 1425 V
MPP trackers	1	
Maximum operating input current	180 A	
Maximum input short-circuit current	325 A	
Output (AC)		
Nominal AC power	125000 W	150000 W
Maximum apparent power	125000 VA	150000 VA
Output phases / line connections	3 / 3-PE	
Nominal AC voltage	480 V	600 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 / 0.0 leading ... 0.0 lagging	
Harmonics (THD)	<3%	
Efficiency		
CEC efficiency (preliminary)	98.5 %	98.5 %
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 / 444 mm (30.3 / 32.7 / 17.5 in.)	
Device weight	85 kg (185 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 @ 1 m and 25°C)	< 65 dB(A)	
Internal consumption at night	< 5 W	
Topology	Transformerless	
Cooling concept	OptiCool (forced convection, variable speed fans)	
Enclosure protection rating	Type 4X (as per UL 508)	
Maximum permissible relative humidity (non-condensing)	100%	
Additional information		
Mounting	Rack mount	
DC connection	Terminal lugs - up to 600 kcmil CU/AL	
AC connection	Screw terminals - up to 300 kcmil CU/AL	
LED indicators (Status/Fault/Communication)	●	
SMA Speedwire (Ethernet network interface)	● (2 × RJ45 ports)	
Data protocols: SMA Modbus / SunSpec Modbus / Webconnect	● / ● / ●	
OptiTrac Global Peak (shade tolerant MPP tracking)	●	
PID Mitigation Solution	○	
Integrated Plant Control / Q on Demand 24/7	● / ●	
Off-grid capable / SMA Fuel Save Controller compatible	● / ●	
SMA Smart Connected (proactive monitoring and service)	●	
Certifications (pending as of June 2018)		
Certifications and approvals	UL 1741, UL 1998, IEEE 1547, CAN/CSA-C22.2 No.62109	
FCC compliance	FCC Part 15, Class A	
Grid interconnection standards	UL 1741 SA - CA Rule 21, HECO Rule 14H, PRC024-02	
Advanced grid support capabilities	L/HRT, L/HVRT, Volt-VAr, Volt-Watt, Frequency-Watt, Ramp Rate Control, Fixed Power Factor	
Warranty		
Standard	5 years	
Optional extensions	10 / 15 / 20 years	
Type designation	SHP 125-US-20	SHP 150-US-20

* Preliminary data as of June 2018 ● Standard features ○ Optional features

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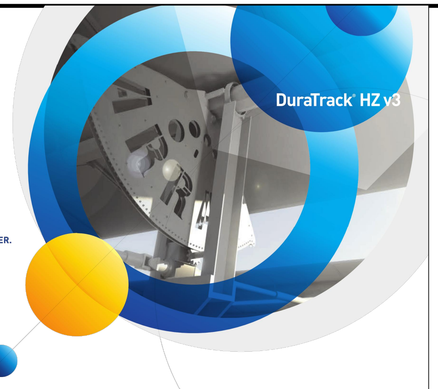
www.SMA-America.com

SMA America, LLC

ARRAY TECHNOLOGIES



RELIABILITY IS POWER.

167×
fewer components than competitive trackers

25,000+
Megawatt Years of Operation

THE MOST RELIABLE TRACKER UNDER THE SUN

HIGHEST POWER DENSITY.

Higher density means more power and more profit. DuraTrack HZ v3 offers the unique ability to maximize the power density of each site, boasting 6% more density than our closest competitor.

LEADING TERRAIN ADAPTABILITY.

Uneven terrain? Hill yes! Our flexibly linked architecture, with articulating driveline joints and forgiving tolerances, create the most adaptable system in market for following natural land contours and creates the greatest power generation potential from every site.

FEWER COMPONENTS. GREATER RELIABILITY.

Less is more. Array was founded on a philosophy of engineered simplicity. Minimizing potential failure points (167 times fewer components than competitors), DuraTrack HZ v3 consistently delivers higher reliability and superior uptime.

FAILURE-FREE WIND DESIGN.

DuraTrack HZ v3 was designed and field tested to withstand some of the harshest conditions on the planet. It is the only tracker on the market that reliably handles wind events with a fully integrated, fully automatic wind-load mitigation system.

ZERO SCHEDULED MAINTENANCE.

Three decades of solar tracker system design, engineering and testing has resulted in uncompromising reliability. Maintenance-free motors and gears, fewer moving parts, and industrial-grade components means maintenance-free energy generation.

ARRAY TECHNOLOGIES, INC.

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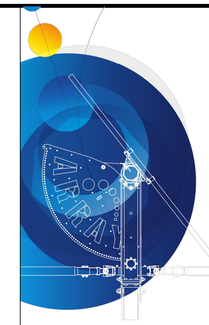


DuraTrack® HZ v3

COST VERSUS VALUE

We believe value is more than the cost of a tracking system. It's about building with forgiving tolerances and fewer parts so construction crews can work efficiently. It means protecting your investment with a failure-free wind management system. It also includes increasing power density. But most of all, value is measured in operational uptime, or reliability.

THE GLOBAL LEADER IN RELIABILITY

Array has spent decades designing and perfecting the most reliable tracker on the planet. Fewer moving parts, stronger components and intelligent design that protects your investment in the harshest weather are but a few of the innovative differences that keep your system running flawlessly all day and you resting easy at night.

UL LISTED IEC CE

STRUCTURAL & MECHANICAL FEATURES/SPECIFICATIONS	
Tracking Type	Horizontal single axis
MW per Drive Motor	Up to 1.036800 MW DC using 360W crystalline
String Voltage	Up to 1,500V DC
Maximum Linked Rows	32
Maximum Row Size	90 modules crystalline, glass-on-glass, and bifacial; 240 modules First Solar 4; 72 modules First Solar 6
Drive Type	Rotating gear drive
Motor Type	2 HP, 3 PH, 480V AC
Motors per 1 MW DC	Less than 1
East-West / North-South Dimensions	Site / module specific
Array Height	94" standard, adjustable (48" min height above grade)
Ground Coverage Ratio (GCR)	Flexible, 28–45% typical, others supported on request
Terrain Flexibility	N-S tolerance: 0° - 8.5° standard, 15° optional Driveline: 40" in all directions
Modules Supported	Most commercially available, including frameless crystalline, thin film, and bifacial
Tracking Range of Motion	± 52° standard, ± 42° optional
Operating Temperature Range	-30°F to 140°F (-34°C to 55°C)
Module Configuration	Single-in-portrait standard, including bifacial. Two-or-three in landscape (framed or frameless), four-in-landscape (thin film) also available.
Module Attachment	Single fastener, high-speed mounting clamps with integrated grounding. Traditional rails for crystalline in landscape, custom racking for thin film and frameless crystalline and bifacial per manufacturer specs.
Materials	HDG steel and aluminum structural members
Allowable Wind Load (IBC 2012)	135 mph, 3-second gust exposure C
Wind Protection	Passive mechanical system relieves wind and obstruction damage — no power required
ELECTRONIC CONTROLLER FEATURES/SPECIFICATIONS	
Solar Tracking Method	Algorithm with GPS input
Control Electronics	MCU plus Central Controller
Data Feed	MODBUS over Ethernet to SCADA system
Night-time Stow	Yes
Tracking Accuracy	± 2° standard, field adjustable
Backtracking	Yes
INSTALLATION, OPERATION & MAINTENANCE	
PE Stamped Structural Calculations & Drawings	Yes
On-site Training & System Commissioning	Yes
Connection Type	Fully bolted connections, no welding
In-field Fabrication Required	No
Dry Slide Bearings & Articulating Driveline Connections	No lubrication required
Scheduled Maintenance	None required
Module Cleaning Compatibility	Robotic, Tractor, Manual
GENERAL	
Annual Power Consumption (kWh per 1 MW)	400 kWh per MW per year, estimated
Land Area Required per 1 MW	Approx. 4 to 4.5 acres per MW @ 33% GCR (site and design specific)
Energy Gain vs. Fixed-Tilt	Up to 25%, site specific
Warranty	10 year structural, 5 year drive & control components
Patent Numbers	US patent 8,459,249 US patent 9,281,778 US patent 9,581,678 B2 and patents pending
Codes and Standards	UL Certified (3703 & 2703); IEC 62817

REV 1.3 – 09.20.2018

NEW

CanadianSolar

BiKu MODULE

NEW GENERATION BIFACIAL MODULE
FRONT POWER RANGE: 350W ~ 365W
ADDITIONAL BACK POWER OUTPUT UP TO 30%
CS3U-350|355|360|365PB-FG

MORE POWER

- UP TO 30% — Up to 30% more energy yield due to back side power generation
- 42°C — Low NMOT: 42 ± 3 °C; Low temperature coefficient (Pmax): -0.37 % / °C
- Innovative module design, Better shading tolerance

MORE RELIABLE

- Lower internal current, lower hot spot temperature
- Minimizes micro-cracks and prevents snail trails
- Fire Class A and Type 3 / Type 13
- Heavy snow load up to 5400 Pa, wind load up to 2400 Pa *

*For detailed information, please refer to Installation Manual.

* Both 5BB and MBB modules will be supplied.

- 30 years — power output warranty
- 10 years — product warranty on materials and workmanship

MANAGEMENT SYSTEM CERTIFICATES*

ISO 9001:2008 / Quality management system
ISO 14001:2004 / Standards for environmental management system
OHSAS 18001:2007 / International standards for occupational health & safety

PRODUCT CERTIFICATES*

IEC 61215 / IEC 61730: VDE / CE
UL 1703: CSA

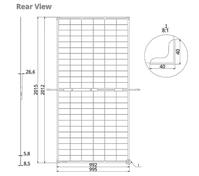
* If you need specific product certificates, and if module installations are to deviate from our guidance specified in our installation manual, please contact your local Canadian Solar sales and technical representatives.

CANADIAN SOLAR INC. is committed to providing high quality solar products, solar system solutions and services to customers around the world. As a leading PV project developer and manufacturer of solar modules with about 30 GW deployed around the world since 2001, Canadian Solar Inc. is one of the most bankable solar companies worldwide.

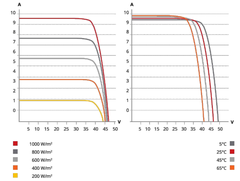
CANADIAN SOLAR INC.
545 Speedvale Avenue West, Guelph, Ontario N1K 1E6, Canada, www.canadiansolar.com, support@canadiansolar.com

ENGINEERING DRAWING (mm)

Rear View



CS3U-355PB-FG / I-V CURVES



ELECTRICAL DATA | STC*

		Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)	Module Efficiency
CS3U-350PB-FG		350 W	39.2 V	8.94 A	46.6 V	9.51 A	17.54%
Bifacial Gain**	5%	368 W	39.2 V	9.39 A	46.6 V	9.99 A	18.44%
	10%	385 W	39.2 V	9.83 A	46.6 V	10.46 A	19.29%
	20%	420 W	39.2 V	10.73 A	46.6 V	11.41 A	21.04%
	30%	455 W	39.2 V	11.62 A	46.6 V	12.36 A	22.80%
CS3U-355PB-FG		355 W	39.4 V	9.02 A	46.8 V	9.59 A	17.79%
Bifacial Gain**	5%	373 W	39.4 V	9.47 A	46.8 V	10.07 A	18.69%
	10%	391 W	39.4 V	9.92 A	46.8 V	10.55 A	19.59%
	20%	426 W	39.4 V	10.82 A	46.8 V	11.51 A	21.34%
	30%	462 W	39.4 V	11.73 A	46.8 V	12.47 A	23.15%
CS3U-360PB-FG		360 W	39.6 V	9.1 A	47 V	9.67 A	18.04%
Bifacial Gain**	5%	378 W	39.6 V	9.56 A	47 V	10.15 A	18.94%
	10%	396 W	39.6 V	10.01 A	47 V	10.64 A	19.84%
	20%	432 W	39.6 V	10.92 A	47 V	11.6 A	21.64%
	30%	468 W	39.6 V	11.83 A	47 V	12.57 A	23.45%
CS3U-365PB-FG		365 W	39.8 V	9.18 A	47.2 V	9.75 A	18.29%
Bifacial Gain**	5%	383 W	39.8 V	9.64 A	47.2 V	10.24 A	19.19%
	10%	402 W	39.8 V	10.1 A	47.2 V	10.73 A	20.14%
	20%	438 W	39.8 V	11.02 A	47.2 V	11.7 A	21.94%
	30%	475 W	39.8 V	11.93 A	47.2 V	12.68 A	23.80%

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.
** Bifacial Gain: The additional gain from the back side compared to the power of the front side at the standard test condition. It depends on mounting (structure, height, tilt angle etc.) and albedo of the ground.

ELECTRICAL DATA

Operating Temperature	-40°C ~ +85°C
Max. System Voltage	1500 V (IEC) or 1000 V (IEC/UL)
Module Fire Performance	TYPE 3 / Type 13 (UL 1703) or CLASS A (IEC61730)
Max. Series Fuse Rating	20 A
Application Classification	Class A
Power Tolerance	0 ~ + 5 W
Power Bifaciality*	70 %

* Power Bifaciality = P_{max_rear} / P_{max_front}, both P_{max_rear} and P_{max_front} are tested under STC, Bifaciality Tolerance: ± 5 %

* 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, Canadian Solar Inc. reserves the right to make necessary adjustment to the information described herein at any time without further notice.

ELECTRICAL DATA | NMOT*

		Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)
CS3U-350PB-FG		260 W	36.2 V	7.18 A	43.7 V	7.67 A
Bifacial Gain**	5%	264 W	36.4 V	7.25 A	43.9 V	7.74 A
	10%	268 W	36.6 V	7.31 A	44.1 V	7.80 A
	20%	271 W	36.8 V	7.38 A	44.3 V	7.87 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

MECHANICAL DATA

Specification	Data
Cell Type	Poly-crystalline
Cell Arrangement	144 [2 x (12 x 6)]
Dimensions	2012 × 992 × 5.8 mm (79.2 × 39.1 × 0.23 in) without J-Box and corner protector
(Incl. corner protector)	2015 × 995 × 8.5 mm (79.3 × 39.2 × 0.33 in) without J-Box
Weight	29.3 kg (64.6 lbs)
Front / Back Glass	2.5 mm heat strengthened glass
Frame	Frameless
J-Box	IP68, 3 diodes
Cable	4.0 mm² (IEC), 12 AWG (UL)
Cable Length (Including Connector)	Portrait: 400 mm (15.7 in) (+) / 200 mm (7.9 in) (-); landscape: 1250 mm (49.2 in); leap-frog connection: 1670 mm (65.7 in)*
Connector	T4 series
Per Pallet	30 pieces
Per Container (40' HQ)	660 pieces

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.37 % / °C
Temperature Coefficient (Voc)	-0.29 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	42 ± 3°C

PARTNER SECTION

CANADIAN SOLAR INC.
545 Speedvale Avenue West, Guelph, Ontario N1K 1E6, Canada, www.canadiansolar.com, support@canadiansolar.com

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/05/2018	EAA	NJM	
B	ISSUED FOR REVIEW	2/22/19	JPD	NJM	JAB

AVANGRID RENEWABLES

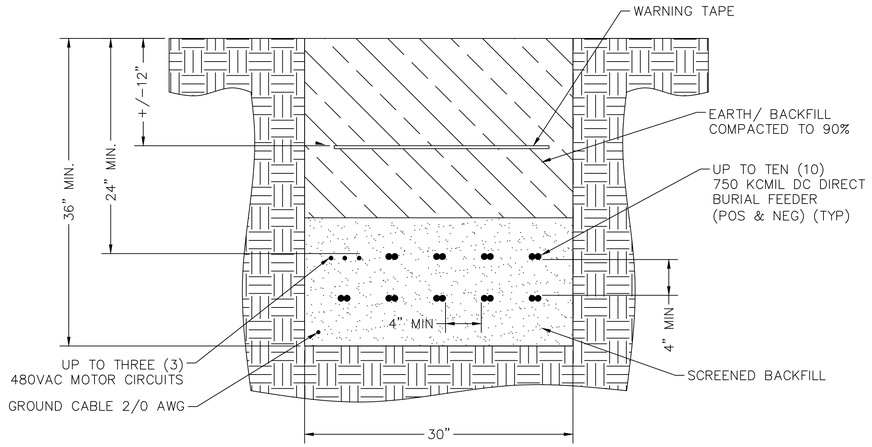
MOTT MACDONALD

10415 MORADO CIRCLE
BUILDING 1, SUITE 200
AUSTIN, TX 78759
PHONE 512.342.9516
FAX 512.342.9708

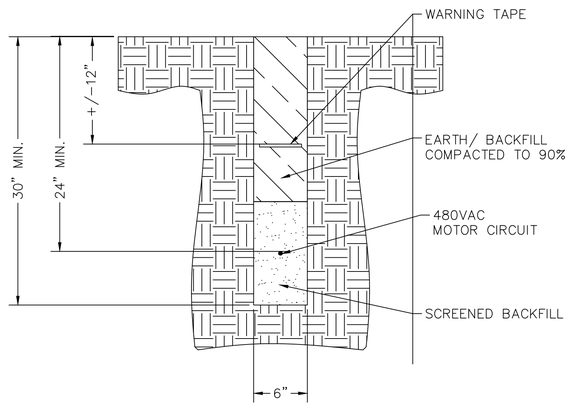
ENGINEERING RECORD	DATE
DRAWN: E.AGUIRRE	10/25/18
DESIGNED: N.MATTHYSSE	10/25/18
CHECKED: J.BERKOW	12/05/18
APPROVED: J.BERKOW	12/05/18

MOHAWK SOLAR PROJECT
EQUIPMENT SPECIFICATIONS

CADFILE: MHS-E-407-01.dwg | SCALE:NONE | DWG.NO.MHS-E-407-01 | SHEET 1 of 1 | REV B



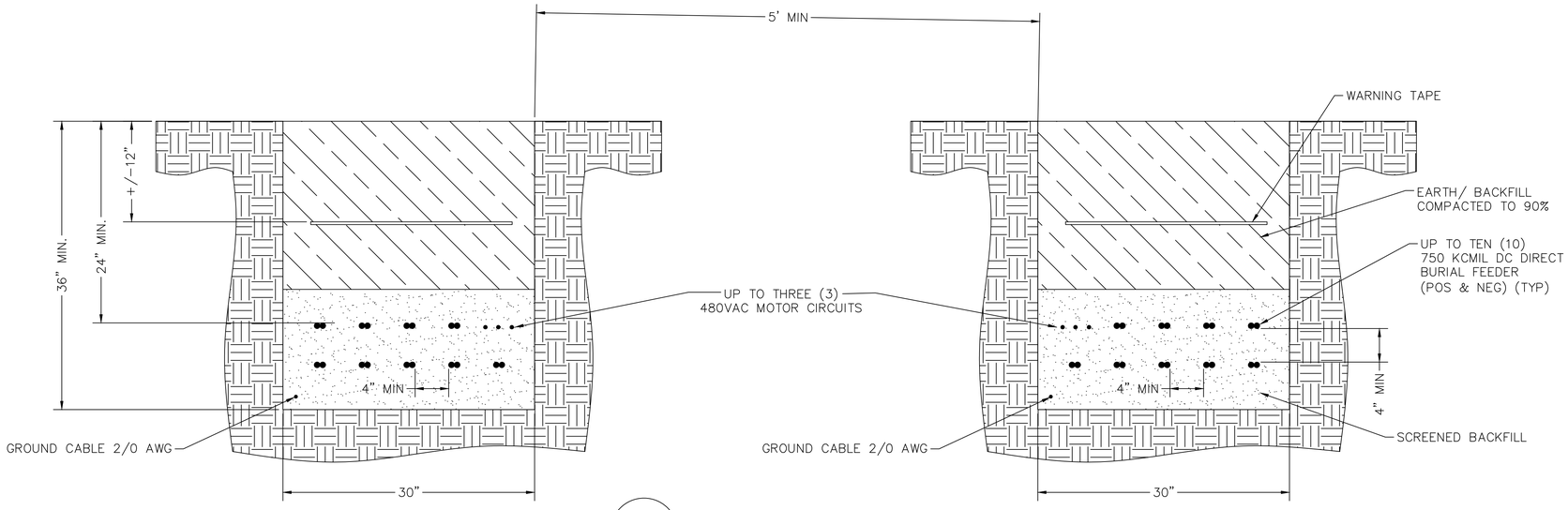
1 --- 30" x 36" TRENCH DETAIL
1-1/2" = 1'-0"



2 --- 6" x 30" TRENCH DETAIL
1-1/2" = 1'-0"

GENERAL NOTES:

1. TRENCHING SHALL BE COMPLETED IN ACCORDANCE WITH THE NEC ARTICLE 300.
2. AMPACITY CALCULATIONS SHALL BE COMPLETED DURING DETAILED DESIGN TO CONFIRM TRENCHING ARRANGEMENTS.



3 --- TWO (2) 30" x 36" TRENCH DETAIL
1-1/2" = 1'-0"

NO.	REVISIONS	DATE	BY	CHK	APR

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/19/18	RA	NM	JAB
B	ISSUED FOR REVIEW	2/22/19	JPD	NJM	JAB

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DESIGNED: N. MATTHYSSE	12/19/18
CHECKED: J. BERKOW	12/19/18
APPROVED: J. BERKOW	12/19/18
CADFILE: MHS-E-408-01.dwg	

MOHAWK SOLAR PROJECT
TYPICAL TRENCH DETAILS

SCALE:1-1/2"=1'-0" | DWG.NO. MHS-E-408-01 | SHEET 1 OF 1 | REV B