TERMS AND ABBREVIATIONS

ABBRV	TERM
(#)	NUMERICAL QUANTITIES WHEN ENCLOSED IN PARENTHESIES
A\E	ARCHITECT/ENGINEER
AB	ANCHOR BOLT
ABC	AGGREGATE BASE COURSE
ARCH	ARCHITECT
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
CBC	CALIFORNIA BUILDING CODE
CIP	CAST-IN-PLACE
CD	CONTRACT DOCUMENTS
CJ	CONSTRUCTION JOINT CONTROL JOINT
CL	CENTERLINE
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
D	DEPTH
DIA	DIAMETER
DIM	DIMENSION
DL	DEAD LOAD
EA	EACH
EL	ELEVATION
EQ	EQUAL
EXT	EXTERIOR
EW	EACH WAY
(F)	FUTURE
FF	FINISH FLOOR ELEVATION
FLR	FLOOR
FT	FEET
FTG	FOOTING
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GSN	GENERAL STRUCTURAL NOTES
HORIZ	HORIZONTAL
HSS	HOLLOW STRUCTURAL
I	SECTION MOMENT OF INERTIA
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIAMETER
KIP, K	ONE THOUSAND POUNDS
KLF	KIP PER LINEAR FOOT
L	STEEL ANGLE
LB	POUND
LL	LIVE LOAD
LLBB	LONG LEG BACK TO BACK
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LSH	LONG SIDE HORIZONTAL
LSV	LONG SIDE VERTICAL
MCJ	MASONRY CONTROL JOINTS
MECH	MECHANICAL
MFR	MANUFACTURER
NA	NOT APPLICABLE
NTS	NOT TO SCALE
OC	ON CENTER
PERP	PERPENDICULAR
PL	PLATE
PLF	POUNDS PER LINEAR FOOT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
QA	QUALITY ASSURANCE
QC	QUALITY CONTROL
REINF	REINFORCING
REQD	REQUIRED
RFI	REQUEST FOR INFORMATION
SF	SQUARE FOOT
SIM	SIMILAR
SPEC	SPECIFICATION
STD	STANDARD
T&B	TOP AND BOTTOM
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
W/C	WATER TO CEMENT RATIO
W/O	WITHOUT
WL	WINDLOAD

CODE:

2015 EDITION OF THE INTERNATIONAL BUILDING CODE (IBC)

DESIGN LOADS:

1. ROOF:
   - LIVE LOAD ____ 12 PSF
   - DEAD LOAD ____ 8 PSF
2. WIND LOAD:
   - RISK CATEGORY ____ I
   - BASIC WIND SPEED, V : ____ 115 MPH
   - EXPOSURE CATEGORY: ____ C
   - IMPORTANCE FACTOR, Iw: ____ 1.0
   - MEAN ROOF HEIGHT: ____ 15 FT
   - G: ____ 0.85
   - Kd: ____ 0.85
   - Kzt: ____ 1.0
   - Kz: ____ 0.85
   - ENCLOSURE CLASSIFICATION: ____ OPEN BUILDING
3. SEISMIC LOADS:
   - RISK CATEGORY ____ I
   - IMPORTANCE FACTOR, Ie : ____ 1.0
   - SEISMIC SITE CLASS: ____ D
   - Ss: ____ 0.182
   - S1: ____ 0.064
   - SDS: ____ 0.194
   - SD1: ____ 0.102
   - SEISMIC DESIGN CATEGORY: ____ D
   - BASIC SEISMIC FORCE RESISTING SYSTEM: STEEL SPECIAL CANTILEVER COLUMN SYSTEMS
   - R: ____ 1.25
   - Ω: ____ 1.25
   - Cd: ____ 1.25
   - Cs: ____ 0.155
   - BASE SHEAR, V: ____ 0.155W
4. SNOW LOAD:
   - RISK CATEGORY ____ I
   - GROUND SNOW LOAD, Pg : ____ 30.0 PSF
   - IMPORTANCE FACTOR, Is: ____ 0.8
   - THERMAL FACTOR, Ct : ____ 1.2
   - EXPOSURE: ____ B
   - EXPOSURE FACTOR: ____ 1.0
   - FLAT ROOF SNOW LOAD, Pf: ____ 20.2 PSF
   - MINIMUM SNOW LOAD, Pm: ____ 16.0 PSF
   - SLOPED ROOF FACTOR, Cs: ____ 1.0
   - DESIGN ROOF SNOW LOAD, Ps: ____ 20.2 PSF

GENERAL:

1. THE CONTRACT STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES.
2. THE CONTRACTOR IS RESPONSIBLE FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK THAT CONFORMS TO THE REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) SAFETY AND HEALTH STANDARDS FOR THE CONSTRUCTION INDUSTRY.
3. WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH STANDARDS SHALL BE THE LATEST EDITION AND/OR ADDENDUM.
4. OPTIONS ARE FOR CONTRACTOR'S CONVENIENCE. HE SHALL BE RESPONSIBLE FOR ALL CHANGES NECESSARY IF HE CHOOSES AN OPTION AND HE SHALL COORDINATE ALL DETAILS.
5. NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS. WHERE NO SPECIFIC DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT.
6. TYPICAL DETAILS ARE NOT CUT ON DRAWINGS, BUT APPLY UNLESS NOTED OTHERWISE.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS WITH ACTUAL SITE CONDITIONS AND GENERAL CONTRACTOR PRIOR TO START OF CONSTRUCTION. ALL DIMENSIONS SHOWN ON STRUCTURAL DRAWINGS ARE TO ASSIST CONTRACTOR IN VERIFICATION. DO NOT SCALE DIMENSIONS FROM DRAWINGS.
8. ITEMS SHOWN BY OTHER DISCIPLINES WITH REFERENCE TO STRUCTURAL DRAWINGS BUT NOT SHOWN ON THESE STRUCTURAL DRAWINGS SHALL BE CONSIDERED DESIGN BUILD ITEMS. CONTRACTOR SHALL SUBMIT DESIGN BY OTHERS FOR REVIEW

FOUNDATIONS:

1. GEOTECHNICAL CONSULTANT: GZA GEOENVIROMENTAL, INC.
2. REPORT NUMBER: 03.00445.00
3. REPORT DATE: MAY 2018
4. DESIGN SOIL BEARING VALUES WERE ASSUMED IN ACCORDANCE WITH SOIL CLASS 5 AS DEFINED IN CBC TABLE 1806.2 "PRESUMPTIVE LOAD-BEARING VALUES". DESIGN BEARING VALUE OF 4,000 PSF AND LATERAL BEARING VALUE OF 150 PSF/FT WAS USED IN DESIGN. IF ACTUAL SOIL CONDITIONS DIFFER NOTIFY THE STRUCTURAL ENGINEER PRIOR TO PROCEEDING WITH WORK.
5. SPREAD FOOTINGS SHALL BEAR ON COMPACTED NATIVE SOILS. BOTTOM OF FOOTINGS SHALL BEAR AT A DEPTH NOT LESS THAN 3.5 FT BELOW LOWEST ADJACENT GRADE WITHIN 5 FEET OF STRUCTURE OR FOUNDATION. FOUNDATION EXCAVATIONS SHALL BE INSPECTED BY GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF CONCRETE.
6. DRILLED POLE FOUNDATIONS SHALL BEAR ON MACHINE CLEANED, INSPECTED SOIL STRATA. POLE FOUNDATIONS WERE DESIGNED IN ACCORDANCE WITH THE PRESCRIPTIVE METHOD OF CBC SECTION 1807.3.2. FOR TOP OF POLE FOUNDATION ELEVATIONS, SEE FOUNDATION PLANS AND SECTIONS. IF WATER IS ENCOUNTERED DURING DRILLING, STOP AND CONSULT STRUCTURAL ENGINEER OR GEOTECHNICAL ENGINEER FOR RESOLUTION.
7. CONFLICTS MAY EXIST BELOW GRADE DUE TO UNKNOWN UTILITIES, BOULDERS OR OTHER OBSTRUCTIONS. IT IS UP TO THE CONTRACTOR AND OWNER TO DO THEIR BEST DUE DILIGENCE PRIOR TO CONSTRUCTION TO AVOID THESE CONFLICTS. THE CONTACTOR SHALL NOT HIT OR DAMAGE ANY UNDERGROUND UTILITIES DURING DRILLING OPERATIONS.
8. IT IS THE CONTRACTORS OPTION TO USE EITHER PIER FOOTINGS OR SPREAD FOOTINGS. BOTH OPTIONS ARE PROVIDED IN THESE DOCUMENTS. THE COST TO USE ONE VERSE THE OTHER SHALL BE NEGOTIATED PRIOR TO CONSTRUCTION WITH THE OWNER. THE PRICES FOR EACH SHALL BE AGREED UPON BETWEEN THE OWNER AND THE CONTACTOR AND IT IS UP TO THE CONTRACTOR TO PRESENT THIS PRICE TO THE OWNER PRIOR TO STARTING CONSTRUCTION. UNITED IS NOT RESPONSIBLE FOR CHANGE ORDERS RELATED TO FOOTINGS.

SHOP DRAWINGS:

1. SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL ITEMS AND ITEMS REQUIRED BY ARCHITECTURAL SPECIFICATIONS. UNITED STRUCTURAL DESIGN, LLC. ASSUMES NO RESPONSIBILITY FOR THE FAILURE OF THE CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR REVIEW.
2. ITEMS NOT IN ACCORDANCE WITH CONTRACT DOCUMENTS SHALL BE FLAGGED UPON CONTRACTORS REVIEW
3. THE CONSTRUCTION DOCUMENTS MAY NOT BE REPRODUCED FOR USE AS SHOP DRAWINGS.
4. ELECTRONIC FILES OF CONSTRUCTION DOCUMENTS WILL NOT BE MADE AVAILABLE FOR USE AS SHOP DRAWINGS.
5. FIELD VERIFY ALL DIMENSIONS AND FINISHED GRADE PRIOR TO CONSTRUCTION AND PRIOR TO BEGINNING SHOP DRAWINGS.
6. THE ENGINEER OF RECORD HAS THE RIGHT TO APPROVE OR DISAPPROVE ANY CHANGES TO CONTRACT DOCUMENTS AT ANYTIME BEFORE OR AFTER SHOP DRAWING REVIEW.
7. ITEMS OMITTED OR SHOWN INCORRECTLY AND ARE NOT FLAGGED BY THE STRUCTURAL ENGINEER OR ARCHITECT SHALL NOT BE CONSIDERED CHANGES TO THE CONTRACT DOCUMENTS.
8. SHOP DRAWINGS DO NOT REPLACE THE CONTRACT DOCUMENTS. REVIEWING IS INTENDED ONLY AS AN AID TO THE CONTRACTOR IN OBTAINING CORRECT SHOP DRAWINGS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE ALL ITEMS ARE CONSTRUCTED ACCORDING TO THE CONTRACT DOCUMENTS.

CONCRETE:

1. CONCRETE WORK SHALL CONFORM TO ALL REQUIREMENTS OF ACI 301, "STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE" AND ACI 318, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE".
2. ADDITION OF WATER TO THE BATCH FOR MATERIAL WITH INSUFFICIENT SLUMP WILL NOT BE PERMITTED, UNLESS THE SUPPLIER HAS SPECIFICALLY WITHHELD WATER FROM THE BATCH AT THE PLANT. IN SUCH CASE THE MIX DESIGN AND TRUCK TICKET MUST CLEARLY STATE THE MAXIMUM AMOUNT OF WATER THAT CAN BE ADDED TO THE BATCH ON SITE. IN NO CASE SHALL THE DESIGN WATER TO CEMENTITIOUS MATERIAL RATIO BE EXCEEDED.
3. MECHANICALLY VIBRATE ALL CONCRETE WHEN PLACED, EXCEPT THAT SLABS ON GRADE NEED BE VIBRATED ONLY AROUND SLAB EDGES, REINFORCING, AND COLUMNS. MECHANICALLY VIBRATE ONLY THE TOP 5 FEET OF DRILLED PIER CONCRETE. REVIBRATE TOP OF DRILLED PIER 15 MINUTES AFTER PLACING CONCRETE.
4. TEST DATA FOR CONCRETE SUBMITTALS SHALL BE SUBMITTED FOR REVIEW PRIOR TO PLACEMENT OF CONCRETE. REFERENCE ACI 318 CHAPTER 5, TABLE R5.3 FOR SPECIFIC REQUIREMENTS.
5. DRILLED PIER CONCRETE SHALL BE CHANNELED TO FREE FALL DOWN THE SHAFT WITHOUT STRIKING THE REINFORCING OR THE SIDES OF THE SHAFT. MAXIMUM HEIGHT OF FREE-FALL IS 15'-0".
6. CONCRETE PROPERTIES:

CONCRETE USE	MINIMUM 28 DAY COMPRESSIVE STRENGTH
UNLESS NOTED OTHERWISE ALL CONCRETE SHALL BE	4,500 PSI

PHOTOVOLTAIC PANELS:

1. THE PANEL MANUFACTURER IS RESPONSIBLE FOR THE DESIGN OF THE PANELS AND THE DESIGN OF THE PANEL CONNECTIONS TO THE STRUCTURE INCLUDING ALL COMPONENTS REQUIRED TO MAKE THE CONNECTIONS. PHOTOVOLTAIC PANELS, COMPONENTS AND CONNECTIONS SHALL BE DESIGNED TO SUPPORT PANEL WEIGHT PLUS SNOW, WIND, OR SEISMIC LOADING, WHICHEVER COMBINATION PRODUCES THE MOST SEVERE CONDITION IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE.
2. OWNER TO PROVIDE PANEL CAPABLE OF SUPPORTING IN MANOR IN WHICH IS INTENDED BY THESE DRAWINGS (I.E. SUPPORTED BY SHORT END, DUAL SUPPORTS, ETC). SUBMIT PANEL SPEC SHEETS FOR REVIEW PRIOR TO PURCHASING ANY PANELS.
3. CONTRACTOR TO VERIFY PV PANELS WITH OWNER PRIOR TO FABRICATION.
4. THIS IS A DEFERRED SUBMITTAL ITEM.

STRUCTURAL STEEL:

1. LATEST AISC AND AWS CODES APPLY. THE WORD APPROVED INSPECTION 4.4 OF THE AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES IS REDEFINED AS REVIEWED.
2. STEEL SHALL BE FINISHED AT LOCATIONS EXPOSED TO WEATHER WITH A CORROSION RESISTANT COATING APPLICABLE TO WEATHER AND EXPOSURE CONDITIONS OF PROJECT LOCATION.
3. WHEN STRUCTURAL STEEL IS FURNISHED TO A SPECIFIED MINIMUM YIELD POINT GREATER THAN 36 KSI, THE ASTM OR OTHER SPECIFICATION DESIGNATION SHALL BE INCLUDED NEAR THE ERECTION MARK ON EACH SHIPPING ASSEMBLY OR IMPORTANT CONSTRUCTION COMPONENT OVER ANY SHOP COAT OF PAINT PRIOR TO SHIPMENT FROM THE FABRICATORS PLANT.
4. IF IT IS NECESSARY TO SPLICE ANY MEMBER, SPLICE LOCATIONS ARE SUBJECT TO REVIEW BY STRUCTURAL ENGINEER. SPLICES SHALL BE FULL PENETRATION WELDED AND TESTED PER THIS SECTION. INDICATE ALL SPLICE LOCATIONS, AND WELDING PROCEDURES ON SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION.
5. ALL BEAMS SHALL BE ERECTED WITH THE NATURAL CAMBER UPWARDS.
6. ALL BOLTS SHALL BE INSTALLED WITH STEEL WASHERS.
7. ALL WELDING BY WELDERS HOLDING VALID CERTIFICATES AND HAVING CURRENT EXPERIENCE IN TYPE OF WELD SHOWN ON THE DRAWINGS OR NOTES, CERTIFICATES SHALL BE THOSE ISSUED BY AN INDEPENDENT TESTING AGENCY.
8. ALL WELDING DONE BY E70 SERIES LOW HYDROGEN RODS. USE E90 SERIES FOR ASTM A706 REINFORCING BARS.
9. ALL WELDING PER AMERICAN WELDING SOCIETY STANDARDS. ALL WELDS ON DRAWINGS ARE SHOWN AS SHOP WELDS. CONTRACTOR MAY SHOP WELD OR FIELD WELD AT THEIR DISCRETION. SHOP WELDS OR FIELD WELDS SHALL BE SHOWN ON SHOP DRAWINGS.
10. SLAG SHALL BE REMOVED FROM ALL COMPLETED WELDS, AND THE WELD AND ADJACENT BASE METAL SHALL BE CLEANED BY BRUSHING OR OTHER SUITABLE MEANS. WELDED JOINTS SHALL NOT BE PAINTED UNTIL AFTER WELDING HAS BEEN COMPLETED AND THE WELD ACCEPTED.
11. ALL STRUCTURAL STEEL SHALL BE FABRICATED BY A FABRICATOR WITH ANY ONE OF THE FOLLOWING MINIMUM QUALIFICATIONS. QUALIFICATIONS SHALL BE IN EFFECT AT TIME OF BID.
    - AISC CERTIFIED FABRICATOR (STD).
12. STEEL PROPERTIES
    - WIDE FLANGE COLUMNS, BEAMS AND TEES: ASTM A992 (F_y = 50 KSI)
    - STEEL PLATES: ASTM A572 (F_y = 50 KSI)
    - CHANNELS AND ANGLES: ASTM A36 (F_y = 36 KSI)
    - HSS RECTANGULAR STEEL: ASTM A500 Gr. B (F_y = 46 KSI)
    - BOLTS: ASTM A325 OR ASTM A F1852 TWIST-OFF TYPE
    - ANCHOR RODS: ASTM F1554 Gr. 55 (F_y = 55 KSI)
13. STEEL BOLTS SHALL BE PRETENSIONED UNLESS OTHERWISE NOTED AS A SNUG-TIGHT CONNECTION ON THE DRAWINGS OFDETAILS. ONE OF THE FOLLOWING METHODS SHALL BE USED TO ASSURE ADEQUATE PRETENSIONING IS ACHIEVED:
    - TURN-OF-NUT METHOD
    - DIRECT TENSION INDICATOR WASHERS
    - CALIBRATED WRENCH
    - TWIST-OFF TYPE BOLT

STEEL REINFORCING:

1. ALL BARS PER CRSI SPECIFICATIONS AND HANDBOOK. LATEST ACI CODE AND DETAILING MANUAL APPLY. SECURELY TIE ALL BARS IN LOCATION BEFORE PLACING CONCRETE. REINFORCING BAR SPACINGS GIVEN ARE MAXIMUM ON CENTERS.
2. ALL REINFORCING TO BE WELDED SHALL BE WELDED IN ACCORDANCE WITH AWS D1.4. NO TACK WELDING OF REINFORCING BARS IS ALLOWED WITHOUT PRIOR REVIEW OF PROCEDURE BY STRUCTURAL ENGINEER.
3. REINFORCING LAP SPLICES IN CONCRETE SHALL BE PER TYPICAL DETAIL UNLESS NOTED OTHERWISE. ALL SPLICE LOCATIONS ARE SUBJECT TO APPROVAL. PROVIDE BENT CORNER BARS TO MATCH AND LAP WITH HORIZONTAL BARS AT CORNERS AND INTERSECTIONS OF FOOTINGS AND WALLS.
4. TYPICAL REINFORCING BAR STRENGTHS
    - REINFORCING (WELDABLE): ASTM A706, DEFORMED, F_y = 60 KSI
5. TYPICAL CLEAR CONCRETE COVERAGES
    - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3"
    - FORMED CONCRETE EXPOSED TO EARTH OR WEATHER:
      - #6 AND LARGER: 2"
      - #5 AND SMALLER: 1 1/2"

ALL OTHERS PER LATEST EDITION OF ACI 318.

COLD-FORMED STEEL FRAMING:

1. ALL COLD-FORMED STEEL FRAMING SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST EDITION OF SPECIFICATIONS FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS BY THE AMERICAN IRON AND STEEL INSTITUTE AND THE STEEL STUD MANUFACTURERS ASSOCIATION AND ICC ESR-3064P).
2. STEEL FOR ALL MEMBERS AND FOR ALL STRAPS SHALL HAVE A MINIMUM YIELD STRENGTH OF 55,000 PSI.
3. STEEL SHALL BE GALVANIZED AT LOCATIONS EXPOSED TO WEATHER AND WHENEVER NOTED ON THE DRAWINGS.
4. ALL MEMBERS SHALL BE SECURELY SEATED FOR FULL BEARING UNLESS NOTED OTHERWISE.
5. ALL WELDING SHALL BE PERFORMED BY WELDERS EXPERIENCED IN LIGHT GAGE STEEL FRAMING WORK.
6. ALL SCREWS REFERENCED IN THE DRAWINGS FOR LIGHT GAUGE CONNECTIONS SHALL BE DRIL-FLEX BY HILTI OR APPROVED EQUIVALENT (ICC ESR-3332).
7. STEEL STUD SIZES ARE AS INDICATED IN PLANS AND KEYNOTES. THICKNESSES REFERENCED IN THE DRAWINGS ARE AS FOLLOWS:

- 16 GAUGE MATERIAL - 0.059 INCHES
- 14 GAUGE MATERIAL - 0.075 INCHES
- 12 GAUGE MATERIAL - 0.105 INCHES
- 10 GAUGE MATERIAL - 0.134 INCHES

NOTE: THE UNCOATED MINIMUM STEEL THICKNESS OF THE COLD-FORMED STEEL PRODUCTS AS DELIVERED TO THE JOB SITE SHALL NOT AT ANY LOCATION BE LESS THAN 95 PERCENT OF THE DESIGN THICKNESS INDICATED ABOVE.

1704.2.5 SPECIAL INSPECTION OF FABRICATORS:

SPECIAL INSPECTION OF FABRICATION OF STRUCTURAL STEEL BEING PERFORMED ON THE PREMISES OF A FABRICATOR'S SHOP IS REQUIRED.

EXCEPTION: SPECIAL INSPECTIONS OF FABRICATORS WITH ONE OF THE FOLLOWING QUALIFICATIONS IS NOT REQUIRED:
- INTERNATIONAL ACCREDITATION SERVICE, INC. (IAS)APPROVED FABRICATOR.
- AISC CERTIFIED FABRICATOR (STD).

THE SPECIAL INSPECTOR SHALL VERIFY THAT THE FABRICATOR MAINTAINS DETAILED FABRICATION AND QUALITY CONTROL PROCEDURES THAT PROVIDE A BASIS FOR INSPECTION CONTROL OF THE WORKMANSHIP AND THE FABRICATOR'S ABILITY TO CONFORM TO APPROVED CONSTRUCTION DOCUMENTS AND REFERENCED STANDARDS. THE SPECIAL INSPECTOR SHALL REVIEW THE PROCEDURES FOR COMPLETENESS AND ADEQUACY RELATIVE TO THE CODE REQUIREMENTS FOR THE FABRICATOR'S SCOPE OF WORK.

SPECIAL STRUCTURAL INSPECTIONS:

PER IBC SECTION 1704 AND 1705 SPECIAL INSPECTIONS ARE IN ADDITION TO THE REQUIRED INSPECTION CONDUCTED BY THE BUILDING JURISDICTION PER IBC SECTION 110.
THE TYPES OF WORK LISTED BELOW SHALL BE INSPECTED BY A SPECIAL INSPECTOR.

1. ALL SPECIAL INSPECTORS SHALL BE UNDER THE SUPERVISION OF A REGISTERED CIVIL OR STRUCTURAL ENGINEER.
2. THE QUALIFICATIONS OF ALL SPECIAL INSPECTORS SHALL BE REVIEWED AND APPROVED BY THE STRUCTURAL ENGINEER OF RECORD.
3. THE MINIMUM QUALIFICATIONS FOR THE SPECIAL INSPECTORS ARE AS FOLLOWS:

- CONCRETE INSPECTION - I.C.C. CERTIFICATION IN REINFORCED CONCRETE OR E.I.T. CERTIFICATION.
- STRUCTURAL WELDING INSPECTION
  - A. VISUAL TESTING - I.C.C. CERTIFICATION IN STRUCTURAL STEEL AND WELDING OR A.W.S. CERTIFIED WELD INSPECTOR (C.W.I.).
  - B. NON-DESTRUCTIVE TESTING - A.W.S. C.W.I.
- HIGH STRENGTH BOLTING INSPECTION - I.C.C. CERTIFICATION IN STRUCTURAL STEEL AND WELDING.
- SPECIAL CASES - EXPERIENCE ACCEPTABLE TO THE STRUCTURAL ENGINEER OF RECORD.

4. DUTIES AND RESPONSIBILITIES OF THE SPECIAL INSPECTOR:

- THE SPECIAL INSPECTOR SHALL OBSERVE THE WORK REQUIRING SPECIAL INSPECTION FOR CONFORMANCE WITH THE APPROVED DESIGN DRAWINGS AND SPECIFICATIONS.
- THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO BE KEPT AT THE SITE FOR USE BY THE BUILDING OFFICIAL, THE CONTRACTOR, THE STRUCTURAL ENGINEER OF RECORD, AND THE ARCHITECT OF RECORD. IF SPECIAL INSPECTION IS PROVIDED BY ANYONE OTHER THAN THE STRUCTURAL ENGINEER OF RECORD, INSPECTION REPORTS SHALL BE SUBMITTED TO THE OFFICE OF THE STRUCTURAL ENGINEER ON A WEEKLY BASIS. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION, THEN IF UNCORRECTED, TO THE DESIGN AUTHORITY AND THE BUILDING OFFICIAL.
- UPON COMPLETION OF THE ASSIGNED WORK, THE SPECIAL INSPECTOR SHALL COMPLETE AND SIGN A FINAL REPORT CERTIFYING THAT TO THE BEST OF HIS KNOWLEDGE, THE WORK IS IN CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS, AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE CODE.

5. DUTIES AND RESPONSIBILITIES OF THE CONTRACTOR:

- NOTIFY THE RESPONSIBLE INSPECTOR THAT WORK IS READY FOR INSPECTION AT LEAST ONE WORKING DAY (24 HOURS MINIMUM) BEFORE SUCH INSPECTION IS REQUIRED.
- ALL WORK REQUIRING SPECIAL STRUCTURAL INSPECTION SHALL REMAIN ACCESSIBLE AND EXPOSED UNTIL IT IS OBSERVED BY THE SPECIAL STRUCTURAL INSPECTOR.

6. SPECIAL INSPECTION

- INSPECTION OF FABRICATORS
- INSPECTION OF CONCRETE CONSTRUCTION
- INSPECTION OF STRUCTURAL STEEL
- INSPECTION OF SOILS

SEE TABLES ON GSN FOR ADDITIONAL INFORMATION.

1705.6 SPECIAL INSPECTION OF SOILS

SPECIAL INSPECTION FOR EXISTING SITE SOIL CONDITIONS, FILL PLACEMENT AND LOAD-BEARING REQUIREMENTS SHALL BE AS REQUIRED BY TABLE 1705.6.

TABLE 1705.6: REQUIRED VERIFICATION AND INSPECTION OF SOILS

VERIFICATION AND INSPECTION TASK	CONTINUOUS	PERIODIC
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	—	X
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	—	X
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.	—	X
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X	—
5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	—	X

1705.3 SPECIAL INSPECTION OF CONCRETE CONSTRUCTION

SPECIAL INSPECTION AND VERIFICATIONS FOR CONCRETE CONSTRUCTION SHALL BE AS REQUIRED BY TABLE 1705.3.

EXCEPTIONS: SPECIAL INSPECTIONS SHALL NOT BE REQUIRED FOR:
1. ISOLATED SPREAD CONCRETE FOOTINGS OF BUILDING THREE STORIES OR LESS ABOVE GRADE PLANE THAT ARE FULLY SUPPORTED ON EARTH OR ROCK.
2. CONTINUOUS CONCRETE FOOTINGS SUPPORTING WALLS OF BUILDINGS THREE STORIES OR LESS ABOVE GRADE PLANE THAT ARE FULLY SUPPORTED ON EARTH OR ROCK WHERE:
   - THE FOOTINGS SUPPORT WALLS OF LIGHT-FRAME CONSTRUCTION;
   - THE STRUCTURAL DESIGN OF THE FOOTING IS BASED ON A SPECIFIED COMPRESSIVE STRENGTH, f'c, NO GREATER THAN 2,500 PSI REGARDLESS OF THE COMPRESSIVE STRENGTH SPECIFIED.
3. CONCRETE SLABS ON GRADE. STEEL REINFORCING STILL REQUIRES SPECIAL INSPECTION..

TABLE 1705.3: REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCE STANDARD	IBC REFERENCE
1. INSPECT REINFORCEMENT, INCLUDING PRESTRESSING TENDONS, AND VERIFY PLACEMENT.	—	X	ACI 318: Ch. 20, 25.2, 25.3, 26.5.1-26.5.3	1908.4
2. REINFORCING BAR WELDING. a. VERIFY WELDABILITY OF REINFORCING BARS. b. INSPECT SINGLE PASS FILLET WELDS, MAXIMUM 5/16". c. INSPECT ALL OTHER WELDS.	 — — X	 — X X	AWS D1.4 ACI 318: 26.5.4	—
5. VERIFYING USE OF REQUIRED DESIGN MIX.	—	X	ACI 318: Ch 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
7. INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X	—	ACI 318: 26.4.5	1908.6, 1908.7, 1908.8
8. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	—	X	ACI 318: 26.4.7-26.4.9	1908.9
12. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	—	X	ACI 318:26.10.1 (b)	—

Sheet List

Sheet Number	Sheet Name
S0.1	GENERAL STRUCTURAL NOTES
S1.0	OVERALL COLUMN PLAN
S1.1	OVERALL STRUCTURES LAYOUT
S2.1	4 PANEL (+) PLANS
S2.2	4 PANEL (-) PLANS
S2.3	6 PANEL PLANS
S2.4	6 PANEL (16FT) PLANS
S2.5	6 PANEL (5/1) PLANS
S4.1	DETAILS

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STATE OF CONNECTICUT
JOHN B. ELDER
No. 32165
LICENSED PROFESSIONAL ENGINEER
10/17/2018

Skyline SOLAR AZ

Taubman Westfarms Mall

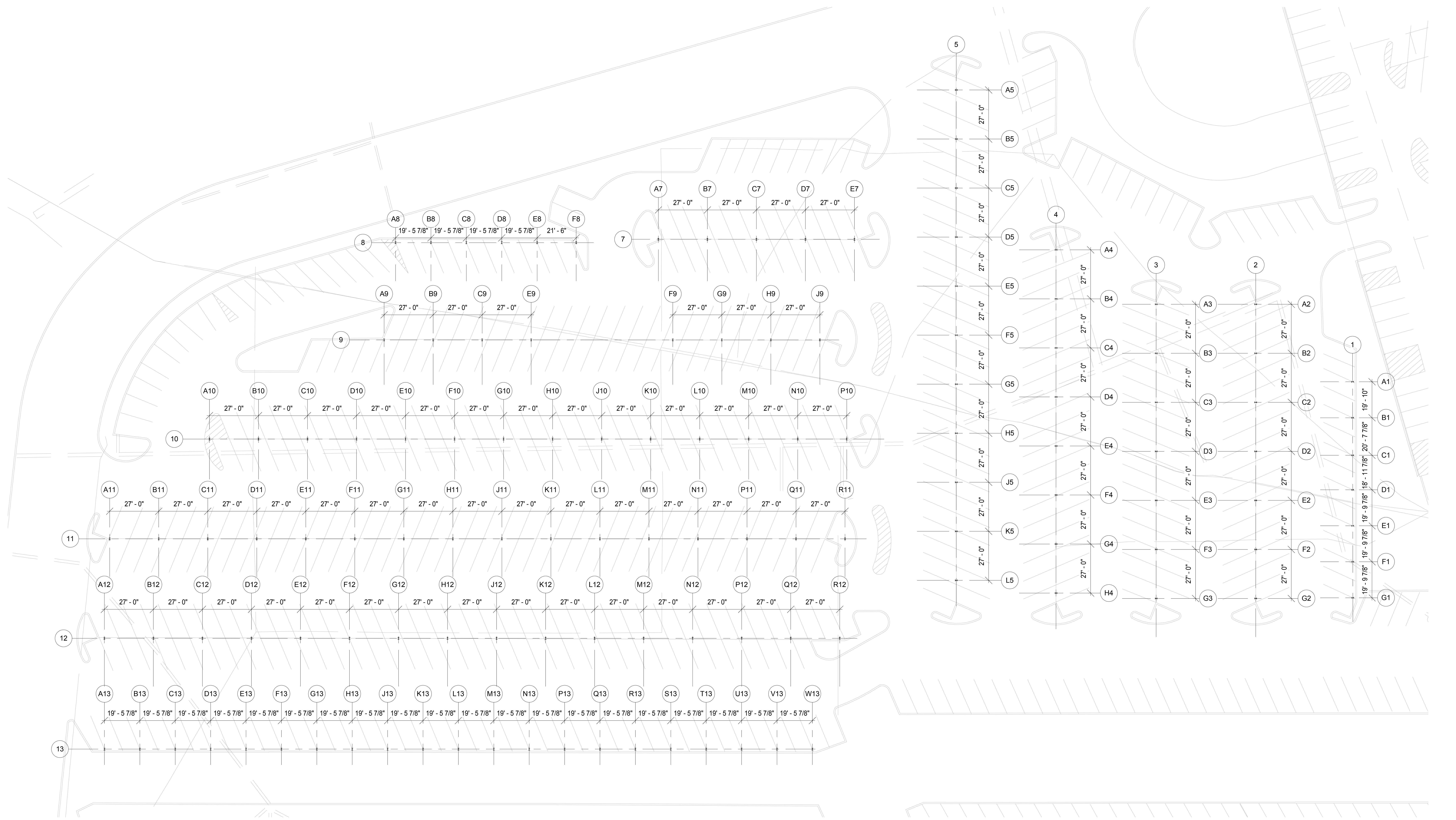
West Hartford, CT 06110

No.	Description	Date

PROJECT NUMBER: 18001.005
DRAWN BY: DB
CHECKED BY: JE
DATE: 10/17/2018

SHEET NAME
GENERAL STRUCTURAL NOTES

S0.1



1 OVERALL COLUMN LAYOUT
NO SCALE

UNITED STRUCTURAL DESIGN LLC
PHOENIX, AZ
(602) 888-1143
www.unitedstr.com

STATE OF CONNECTICUT
JOHN B. ELDER
No. 32165
LICENSED PROFESSIONAL ENGINEER
10/17/2018

Skyline SOLAR OF AZ
A DIVISION OF SKYLINE STEEL, INC.

Taubman Westfarms Mall

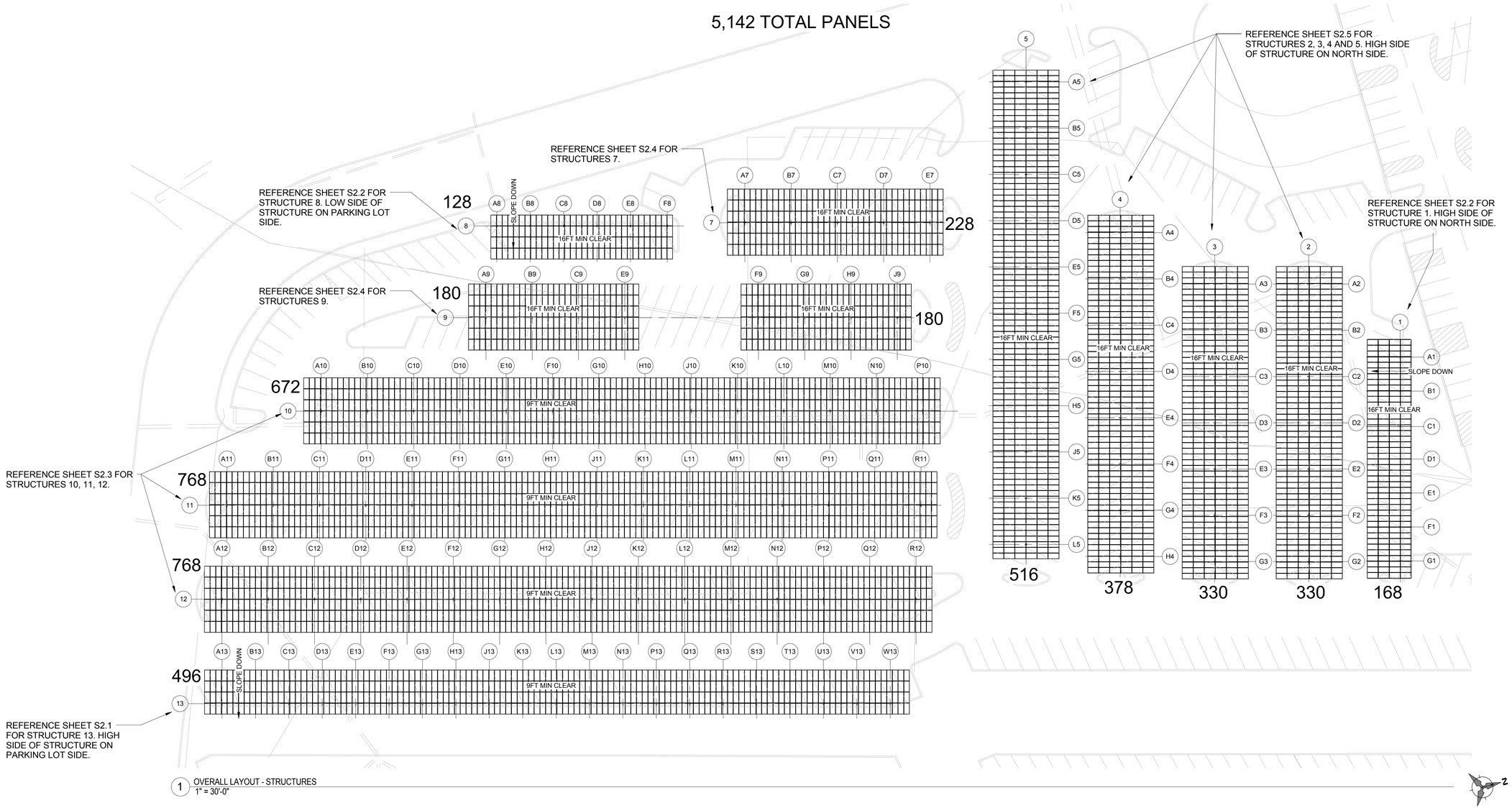
West Hartford, CT 06110

No.	Description	Date

PROJECT NUMBER:	18001.005
DRAWN BY:	DB
CHECKED BY:	JE
DATE:	10/17/2018

SHEET NAME
OVERALL COLUMN PLAN

S1.0



1 OVERALL LAYOUT - STRUCTURES
1" = 30'-0"

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Sterling Solar of AZ
A DIVISION OF SOLAR ENERGY INTERNATIONAL

Taubman Westfarms Mall
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No.	Description	Date

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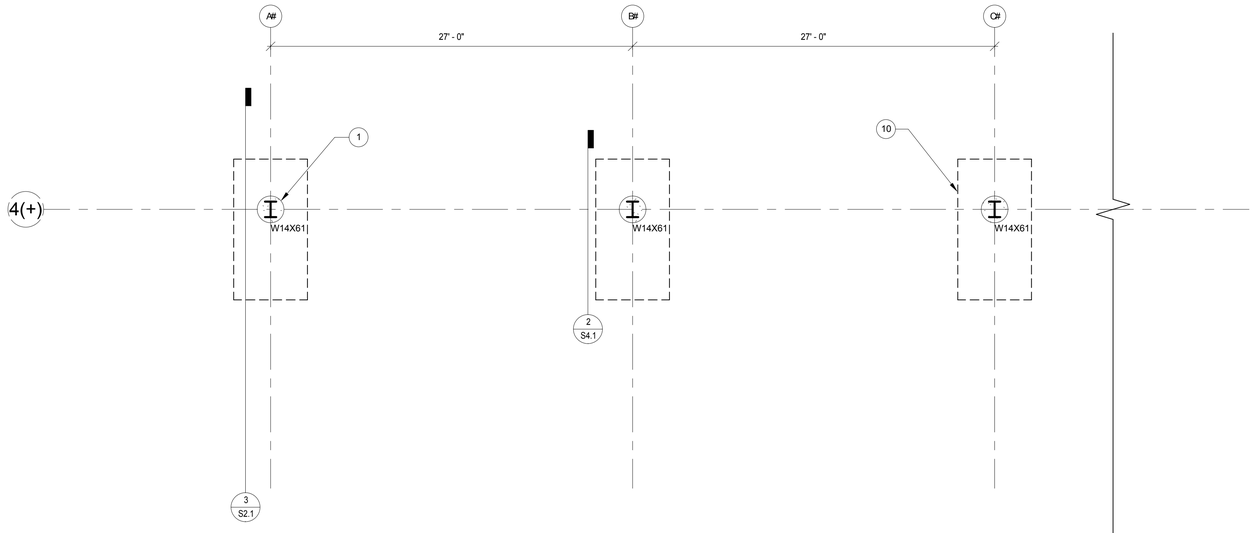
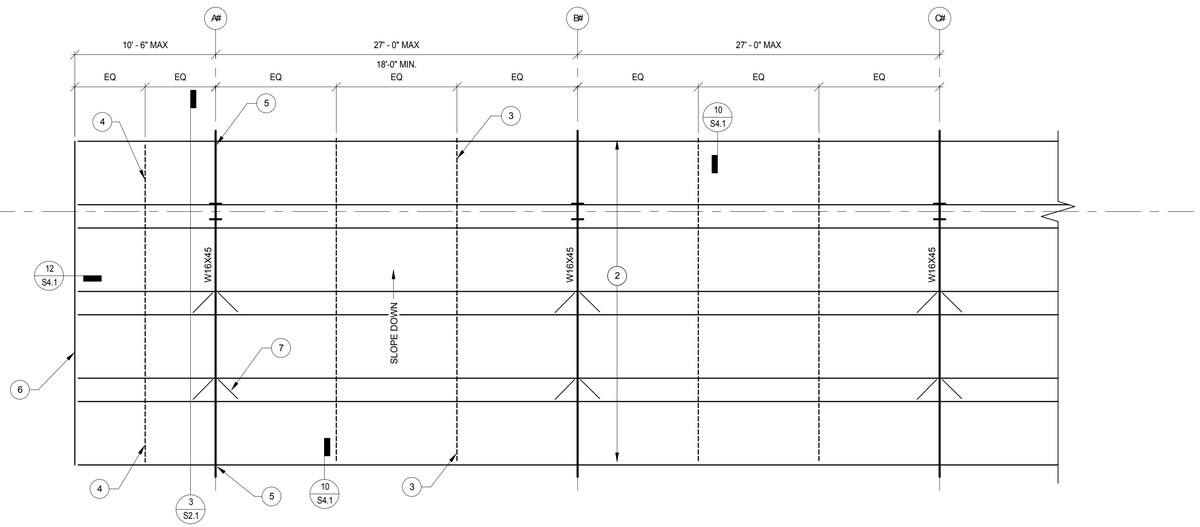
SHEET NAME
OVERALL STRUCTURES LAYOUT

S1.1



1 FOUNDATION PLAN - 4 PANEL (+)
3/16" = 1'-0"



2 FRAMING PLAN - 4 PANEL (+)
3/16" = 1'-0"

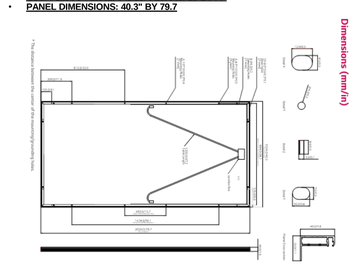
SHEET NOTES

a. VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION. DIMENSIONS, ELEVATIONS WHERE SHOWN ARE TO BE USED AS AN AID AND SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR PRIOR TO CONSTRUCTION.
b. FOR ADDITITIONAL INFORMATION, REFERENCE GENERAL STRUCTURAL NOTES.

PV PANEL INFORMATION

A. CONTRACTOR TO VERIFY PANEL INFORMATION PRIOR TO FABRICATION AND ERECTION.
B. THE PANEL INFORMATION BELOW AND IN THE PLANS WAS PROVIDED BY THE OWNER DURING THE DESIGN PHASE AND PRIOR TO THE START OF CONSTRUCTION. ALL PANEL INFORMATION INDICATED IN THESE DRAWINGS IS FOR REFERENCE ONLY AND SHALL BE VERIFIED WITH THE OWNER, THE ELECTRICAL DRAWINGS AND THE GENERAL CONTRACTOR PRIOR TO FABRICATION AND PRIOR TO CONSTRUCTION.
C. THE OWNER IS TO PROVIDE A PANEL CAPABLE OF SUPPORTING IN MANOR IN WHICH IS INTENDED BY THESE DRAWINGS (I.E. SUPPORTED BY SHORT END, DUAL SUPPORTS, ETC). SUBMIT PANEL SPEC SHEETS FOR REVIEW PRIOR TO PURCHASING ANY PANELS.
D. THE PANEL MANUFACTURER IS RESPONSIBLE FOR THE DESIGN OF THE PANELS INCLUDING ALL IT'S COMPONENTS. PHOTOVOLTAIC PANELS AND IT'S COMPONENTS SHALL BE DESIGNED TO SUPPORT PANEL WEIGHT PLUS SNOW, WIND, OR SEISMIC LOADING, WHICHEVER COMBINATION PRODUCES THE MOST SEVERE CONDITION IN ACCORDANCE WITH THE BUILDING CODE.

- **PANEL MODEL NUMBER: XLG N•ON2 72 CELL**
- **PANEL DIMENSIONS: 40.3" BY 79.7**



KEYNOTES

1 DRILLED CONCRETE POLE FOOTING. FOR DIAMETER AND EMBEDMENT OF FOOTING SEE FOUNDATION PLAN AND SECTION ON THIS SHEET. SEE DETAIL 2/S4.1 FOR REINFORCING AND STEEL COLUMN ANCHORAGE.
2 C10"x3 1/2"x12 GAUGE COLD FORMED STEEL PURLINS, TYPICAL. COORDINATE EXACT LOCATION WITH SOLAR PANEL MANUFACTURER SPECIFICATIONS. SEE DETAIL 9/S4.1 FOR MORE INFORMATION ON SECTION.
3 SAG ROD AT 9'-0" O.C. MAXIMUM, (1) MINIMUM AT SPANS LESS THAN 18'-0" AND (2) MINIMUM AT SPANS LESS THAN 27'-0". SPACE EQUALLY BETWEEN SUPPORTS. REFERENCE DETAIL 10/S4.1.
4 (1) SAG ROD REQUIRED BETWEEN SUPPORT AND CANTILEVER END AS SHOWN. REFERENCE DETAIL 10/S4.1. SAG ROD NOT REQUIRED WHERE CANTILEVER IS LESS THAN 5'-0".
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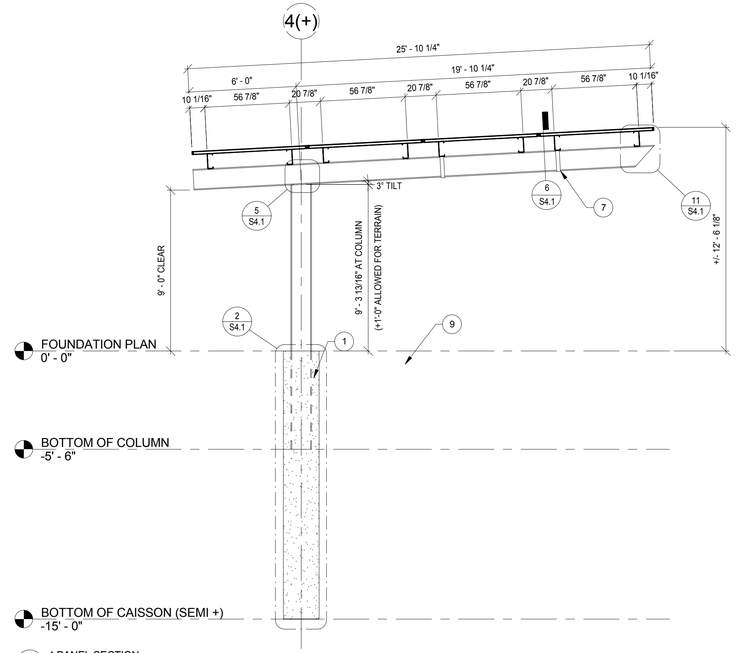
6 10 1/8"x2"x16 GAUGE END CAP EACH END.
7 BEAM FLANGE BRACES AT 6'-6" O.C. MAXIMUM. REFERENCE DETAIL 6/S4.1 FOR MORE INFORMATION.
8 PV MODULE BY OTHERS. ATTACH PER DETAILS.
9 FINISHED GRADE. FINISHED GRADE IS DEFINED AS THE LOWEST ADJACENT FINISHED GRADE WITHIN 5 FEET OF THE STRUCTURAL COLUMN.
10 IF DRILLING POLE FOUNDATIONS IS NOT POSSIBLE, USE SPREAD FOOTING PER DETAIL 8/S4.1 ILO DRILLED FOUNDATION.



3 4 PANEL SECTION
1/4" = 1'-0"

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Skyline SOLAR OF AZ
A DIVISION OF SKYLINE ESTRUCTURES

Taubman Westfarms Mall
West Hartford, CT 06110

No.	Description	Date

PROJECT NUMBER: 18001.005
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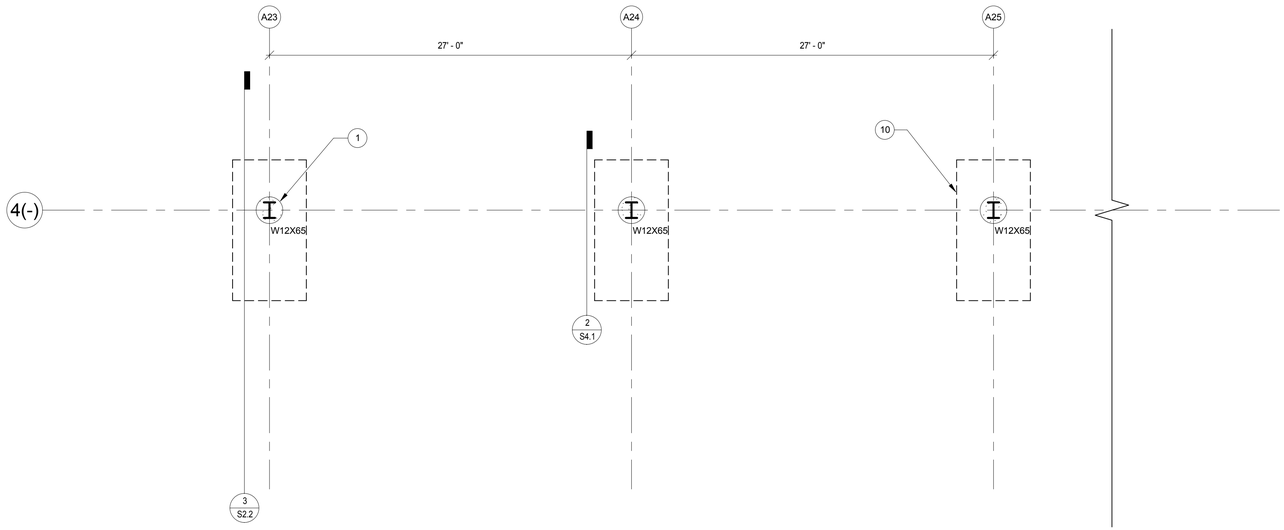
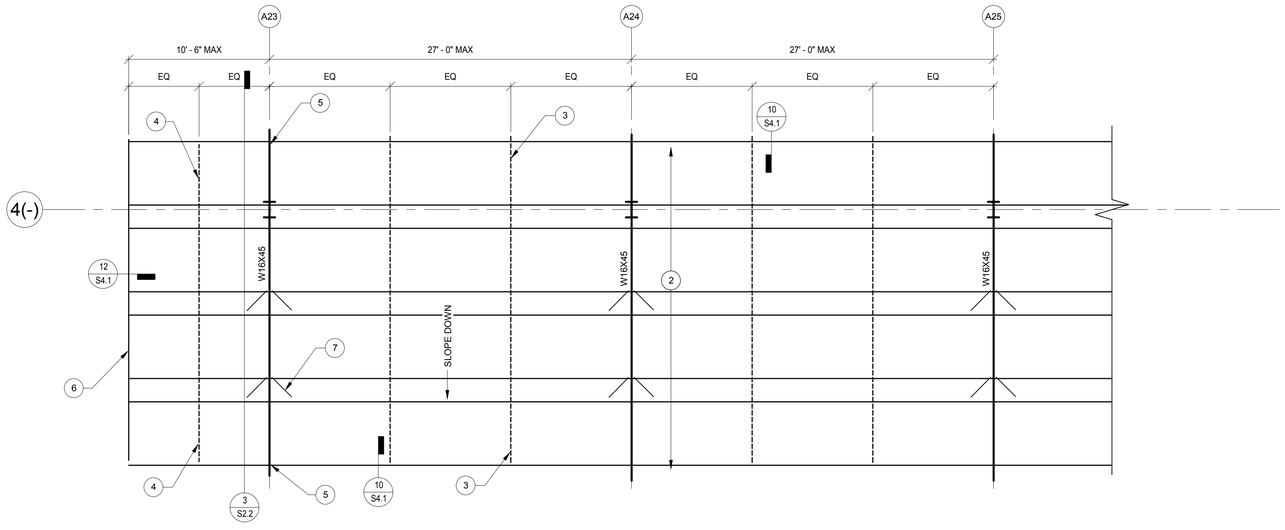
CHECKED BY: JE
DATE: 10/17/2018

SHEET NAME
4 PANEL (+) PLANS

S2.1



1 FOUNDATION PLAN - 4 PANEL (-)
3/16" = 1'-0"



2 FRAMING PLAN - 4 PANEL (-)
3/16" = 1'-0"

KEYNOTES

1. DRILLED CONCRETE POLE FOOTING. FOR DIAMETER AND EMBEDMENT OF FOOTING SEE FOUNDATION PLAN AND SECTION ON THIS SHEET. SEE DETAIL 2/S4.1 FOR REINFORCING AND STEEL COLUMN ANCHORAGE.
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7. BEAM FLANGE BRACES AT 6'-6" O.C. MAXIMUM. REFERENCE DETAIL 6/S4.1 FOR MORE INFORMATION.
8. PV MODULE BY OTHERS. ATTACH PER DETAILS.
10. IF DRILLING POLE FOUNDATIONS IS NOT POSSIBLE, USE SPREAD FOOTING PER DETAIL 8/S4.1 ILO DRILLED FOUNDATION.

SHEET NOTES

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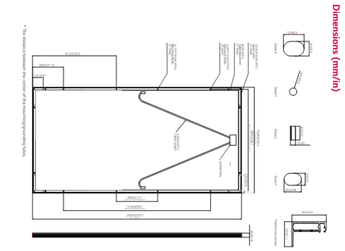
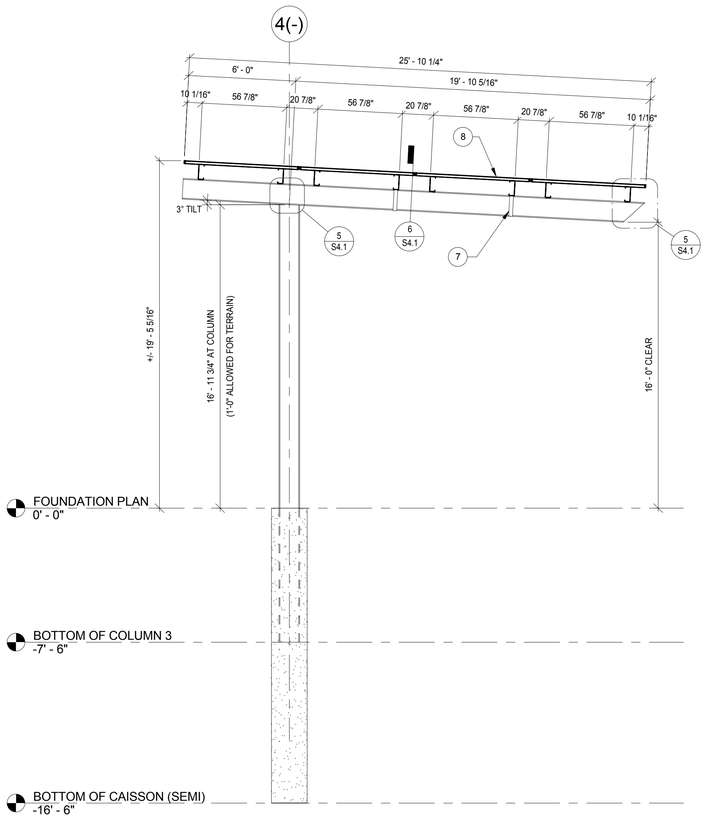
- **PANEL DIMENSIONS: 40.3" BY 79.7**





3 4 PANEL SECTION
1/4" = 1'-0"

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PROFESSIONAL ENGINEER
10/17/2018

Sterling SOLAR OF AZ
A DIVISION OF SOLAR SYSTEMS, INC.

Taubman Westfarms Mall

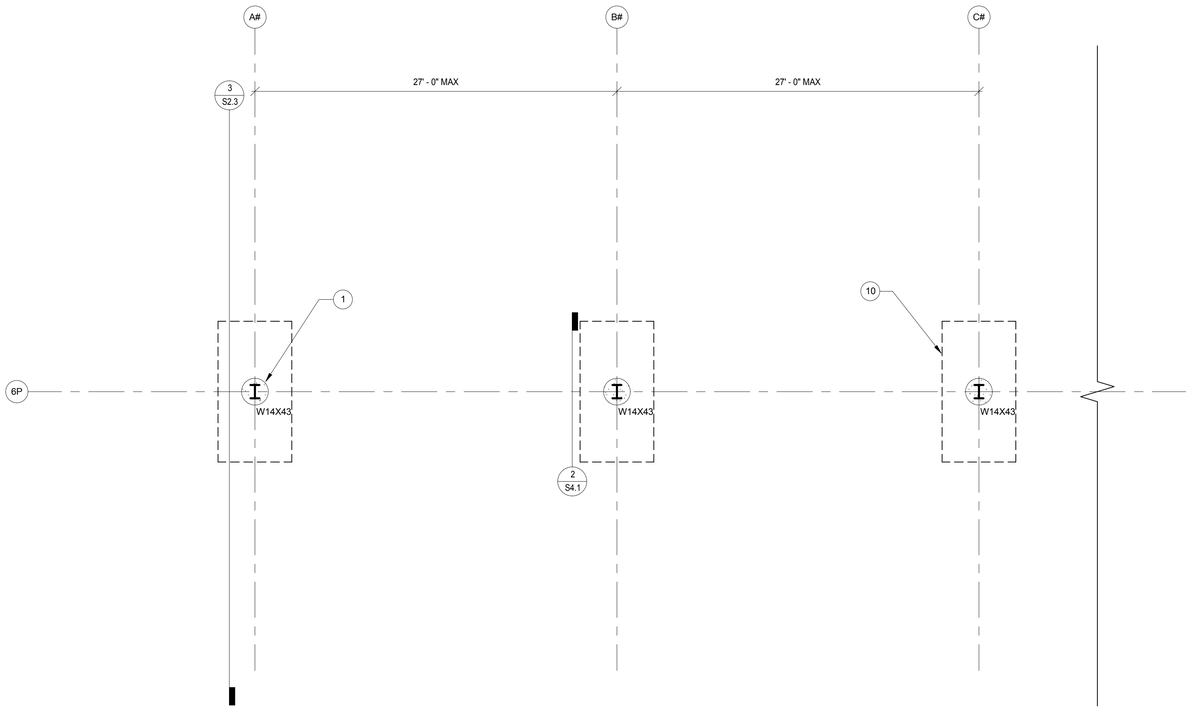
West Hartford, CT 06110

No.	Description	Date

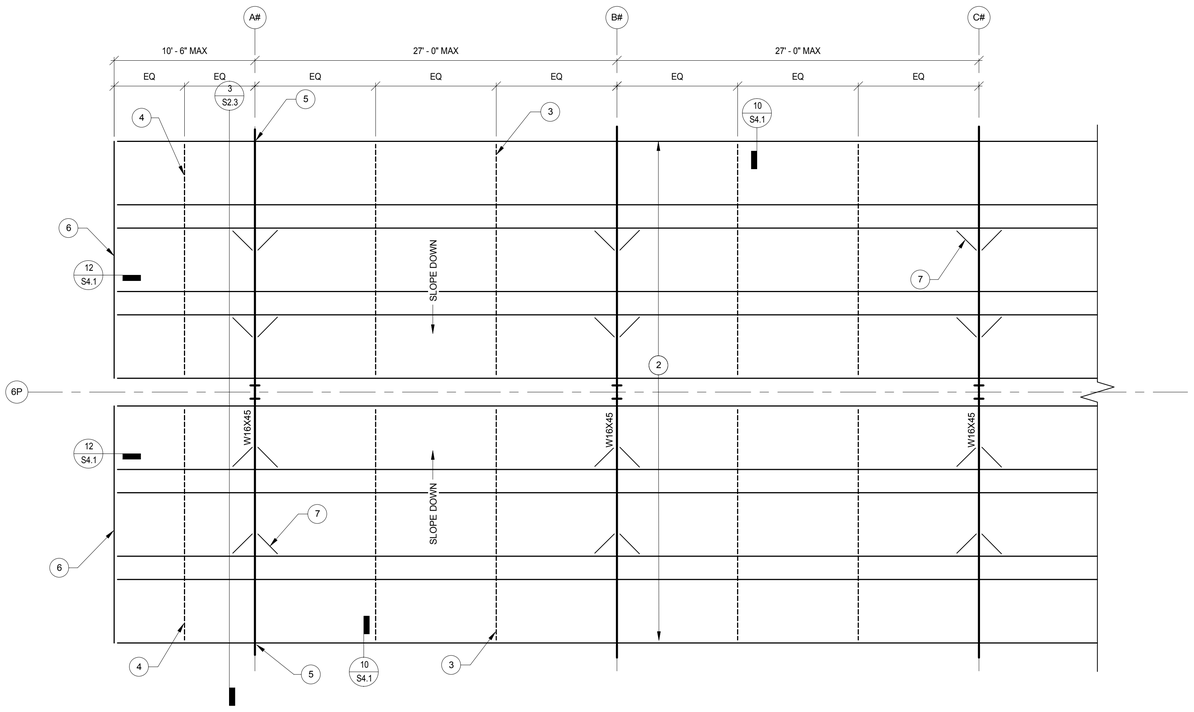
PROJECT NUMBER:	18001.005
DRAWN BY:	DB
CHECKED BY:	JE
DATE:	10/17/2018

SHEET NAME
4 PANEL (-) PLANS

S2.2



1 FOUNDATION PLAN - 6 PANEL
3/16" = 1'-0"



2 FRAMING PLAN - 6 PANEL
3/16" = 1'-0"

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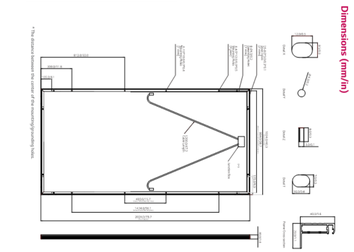

KEYNOTES

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8 PV MODULE BY OTHERS. ATTACH PER DETAILS.
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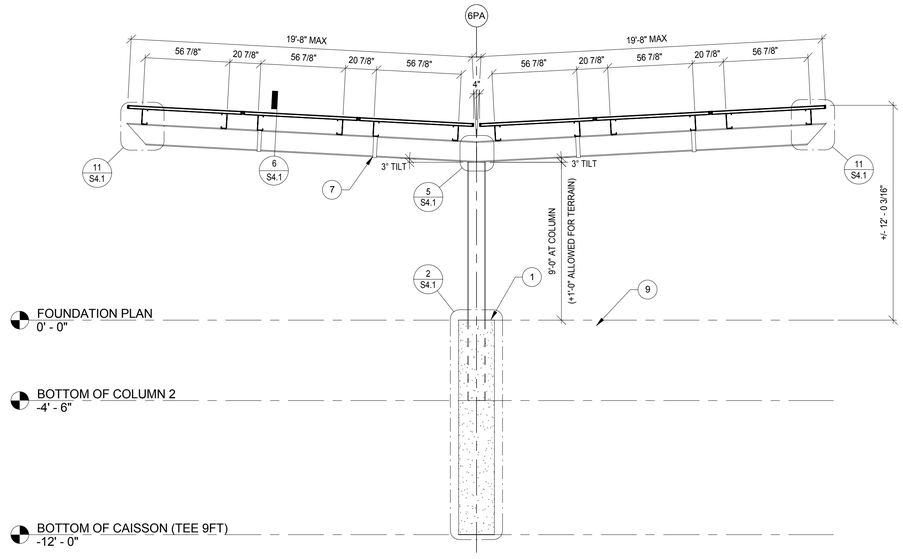

3 6 PANEL SECTION
1/4" = 1'-0"

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10/17/2018

Sterling SOLAR OF AZ
AUTOMATION OF SOLAR INSTALLATIONS

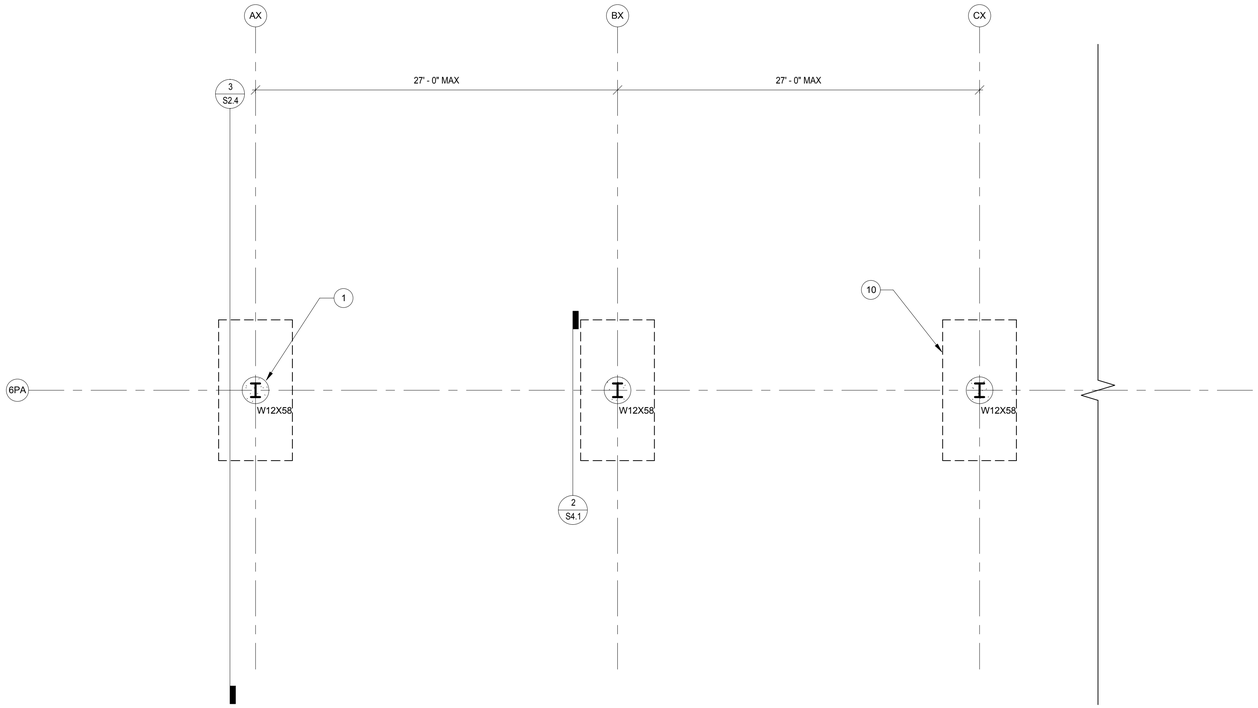
Taubman Westfarms Mall
West Hartford, CT 06110

No.	Description	Date

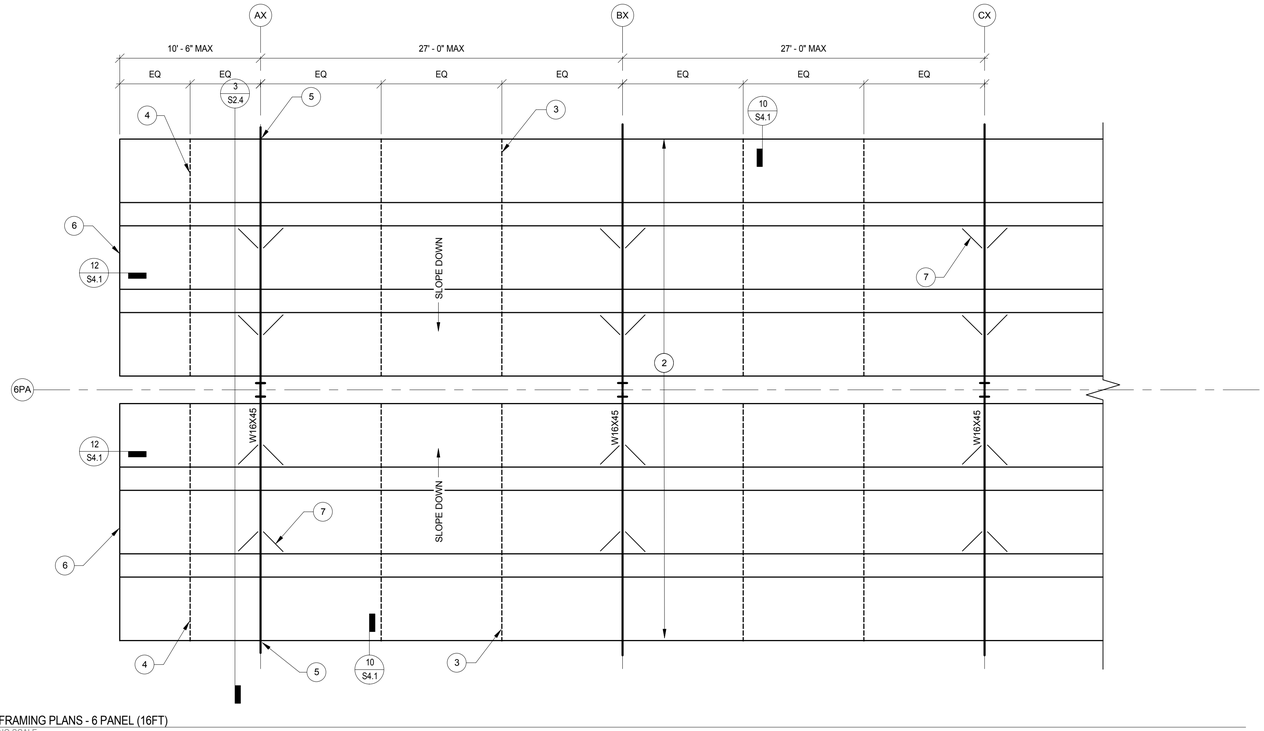
PROJECT NUMBER:	18001.005
DRAWN BY:	DB
CHECKED BY:	JE
DATE:	10/17/2018

SHEET NAME
6 PANEL PLANS

S2.3



1 FOUNDATION PLANS - 6 PANEL (16FT)
NO SCALE



2 FRAMING PLANS - 6 PANEL (16FT)
NO SCALE

KEYNOTES

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7 BEAM FLANGE BRACES AT 6'-6" O.C. MAXIMUM. REFERENCE DETAIL 6/S4.1 FOR MORE INFORMATION.

8 PV MODULE BY OTHERS. ATTACH PER DETAILS.

9 FINISHED GRADE. FINISHED GRADE IS DEFINED AS THE LOWEST ADJACENT FINISHED GRADE WITHIN 5 FEET OF THE STRUCTURAL COLUMN.

10 IF DRILLING POLE FOUNDATIONS IS NOT POSSIBLE, USE SPREAD FOOTING PER DETAIL 8/S4.1 ILO DRILLED FOUNDATION.

SHEET NOTES

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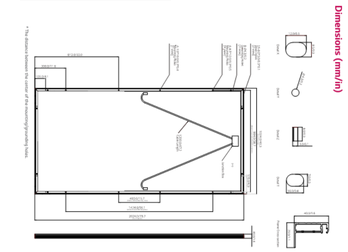
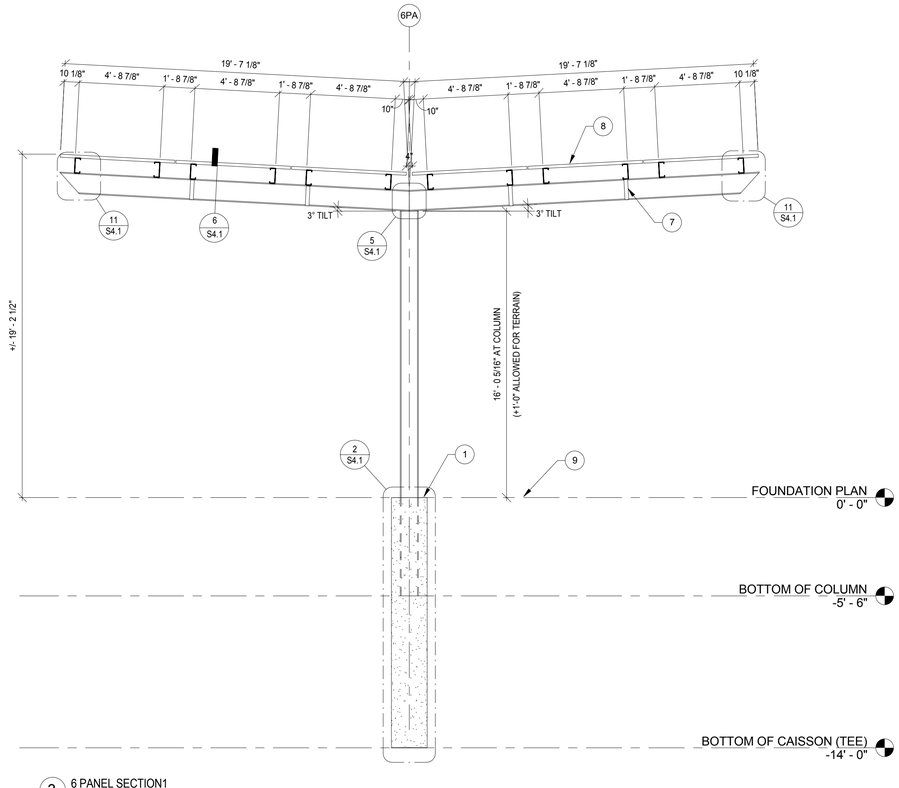
- **PANEL DIMENSIONS: 40.3" BY 79.7**





3 6 PANEL SECTION1
NO SCALE

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No.	Description	Date

PROJECT NUMBER:	18001.005
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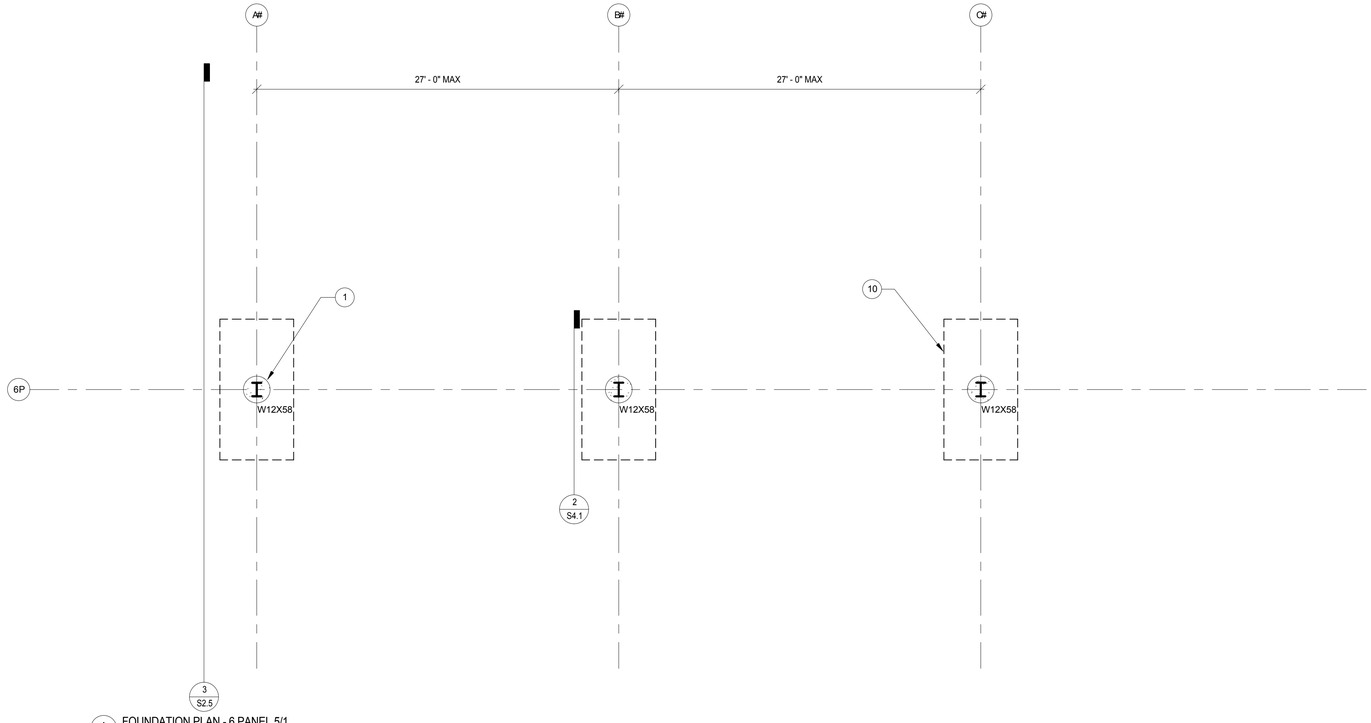
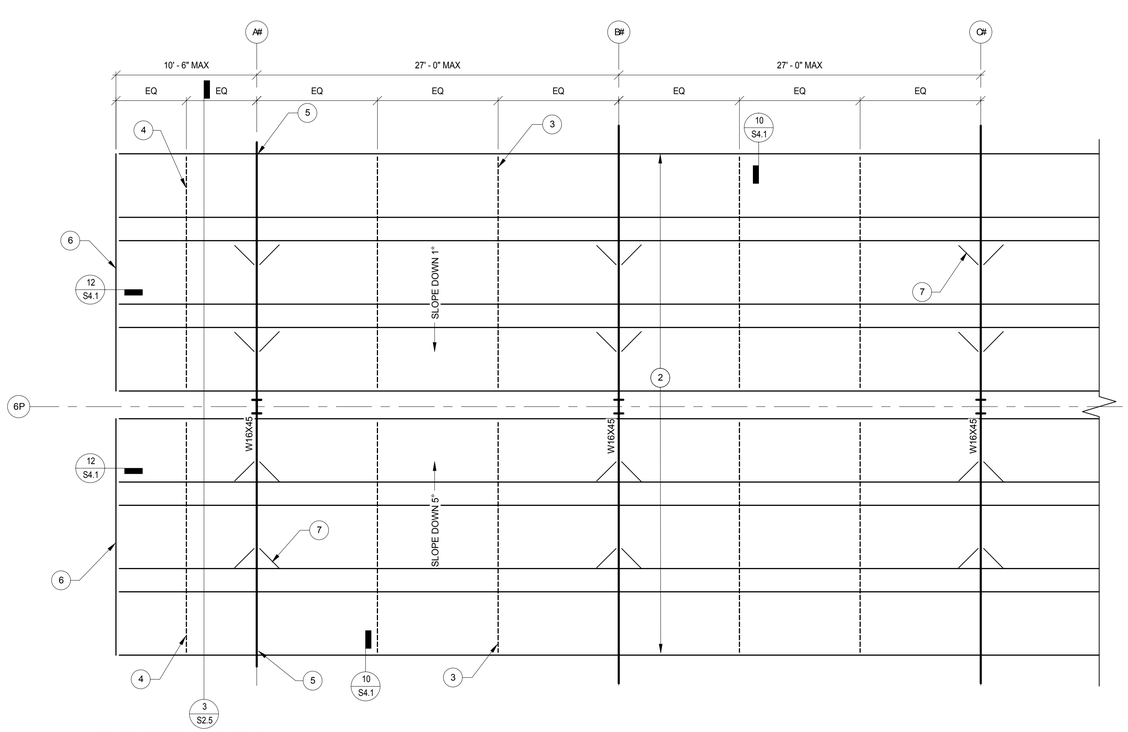
SHEET NAME
6 PANEL (16FT) PLANS

S2.4



1 FOUNDATION PLAN - 6 PANEL 5/1
3/16" = 1'-0"



2 FRAMING PLAN - 6 PANEL 5/1
3/16" = 1'-0"

KEYNOTES

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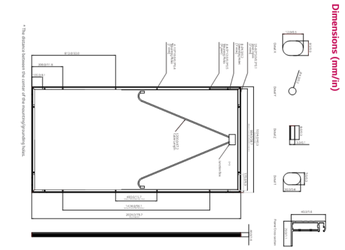
PV PANEL INFORMATION

A. CONTRACTOR TO VERIFY PANEL INFORMATION PRIOR TO FABRICATION AND ERECTION.
B. THE PANEL INFORMATION BELOW AND IN THE PLANS WAS PROVIDED BY THE OWNER DURING THE DESIGN PHASE AND PRIOR TO THE START OF CONSTRUCTION. ALL PANEL INFORMATION INDICATED IN THESE DRAWINGS IS FOR REFERENCE ONLY AND SHALL BE VERIFIED WITH THE OWNER, THE ELECTRICAL DRAWINGS AND THE GENERAL CONTRACTOR PRIOR TO FABRICATION AND PRIOR TO CONSTRUCTION.
C. THE OWNER IS TO PROVIDE A PANEL CAPABLE OF SUPPORTING IN MANOR IN WHICH IS INTENDED BY THESE DRAWINGS (I.E. SUPPORTED BY SHORT END, DUAL SUPPORTS, ETC). SUBMIT PANEL SPEC SHEETS FOR REVIEW PRIOR TO PURCHASING ANY PANELS.
D. THE PANEL MANUFACTURER IS RESPONSIBLE FOR THE DESIGN OF THE PANELS INCLUDING ALL IT'S COMPONENTS. PHOTOVOLTAIC PANELS AND ITS COMPONENTS SHALL BE DESIGNED TO SUPPORT PANEL WEIGHT PLUS SNOW, WIND, OR SEISMIC LOADING, WHICHEVER COMBINATION PRODUCES THE MOST SEVERE CONDITION IN ACCORDANCE WITH THE BUILDING CODE.

- **PANEL MODEL NUMBER: XLG NeON2 72 CELL**
- **PANEL DIMENSIONS: 40.3" BY 79.7**



3 6 PANEL SECTION (5/1)
1/4" = 1'-0"

UNITED STRUCTURAL DESIGN LLC
PHOENIX, AZ
(602) 888-1143
www.unitedstr.com

STATE OF CONNECTICUT
JOHN "B." ELDER
No. 32165
LICENSED
PROFESSIONAL ENGINEER
10/17/2018

Skyline SOLAR OF AZ
A DIVISION OF SKYLINE SPECIALTIES, LLC

Taubman Westfarms Mall

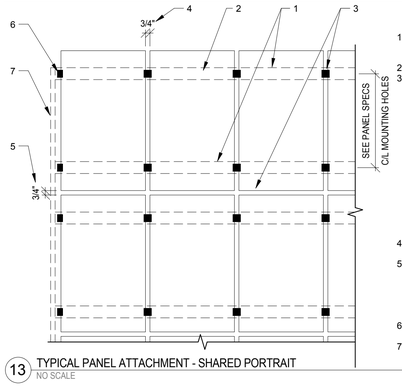
West Hartford, CT 06110

No.	Description	Date

PROJECT NUMBER:	18001.005
DRAWN BY:	DB
CHECKED BY:	JE
DATE:	10/17/2018

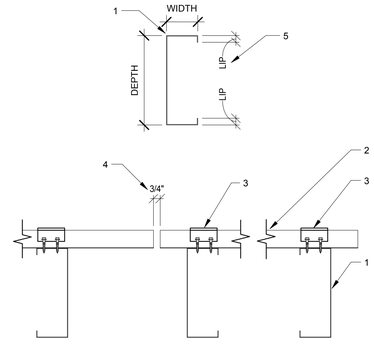
SHEET NAME
6 PANEL (5/1) PLANS

S2.5



1. STEEL PURLIN, SEE PLANS AND GSN FOR SIZE, GAUGE AND FINISH.
2. SOLAR PANELS BY OTHERS.
3. "SKYGRIP" MID CLAMP ALUMINUM BRACKET BY SKYLINE STEEL ATTACHED TO 14 GAUGE THICK PURLINS OR THICKER WITH (2) #12-14 DRIL-FLEX SELF-DRILLING SCREWS BY HILTI (ICC ESR-3332), INSTALL PER MANUFACTURER SPECIFICATIONS. DO NOT OVER TIGHTEN SCREWS WHEN INSTALLING. ANY SCREWS THAT ARE STRIPPED DURING INSTALLATION SHALL BE REMOVED AND REINSTALLED IN NEW HOLES. (4) MINIMUM PER PANEL.
4. SPACING BETWEEN LONG SIDE OF PANELS, TYPICAL.
5. SPACING BETWEEN SHORT SIDE OF PANELS, TYPICAL. CONTRACTOR TO VERIFY PURLIN SPACING WITH PANEL AND BRACKET SPECIFICATIONS PRIOR TO INSTALLATION.
6. SKYGRIP END CLAMP ON ENDS ONLY.
7. END CAP.

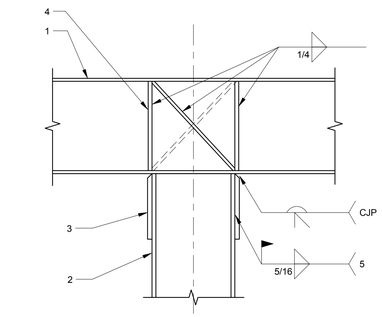
13 TYPICAL PANEL ATTACHMENT - SHARED PORTRAIT
NO SCALE



1. STEEL PURLIN, SEE PLANS AND GSN FOR SIZE, GAUGE AND FINISH.
2. SOLAR PANELS BY OTHERS.
3. "SKYGRIP" ALUMINUM BRACKET BY SKYLINE STEEL ATTACHED TO 14 GAUGE THICK PURLINS OR THICKER WITH (2) #12-14 DRIL-FLEX SELF-DRILLING SCREWS BY HILTI (ICC ESR-3332), INSTALL PER MANUFACTURER SPECIFICATIONS. DO NOT OVER TIGHTEN SCREWS WHEN INSTALLING. ANY SCREWS THAT ARE STRIPPED DURING INSTALLATION SHALL BE REMOVED AND REINSTALLED IN NEW HOLES. (4) MINIMUM PER PANEL.
4. SPACING BETWEEN PANELS, TYPICAL. CONTRACTOR TO VERIFY PURLIN SPACING WITH PANEL AND BRACKET SPECIFICATIONS PRIOR TO INSTALLATION.
5. MINIMUM LIP LENGTH SHALL MEET OR EXCEED THE FOLLOWING:

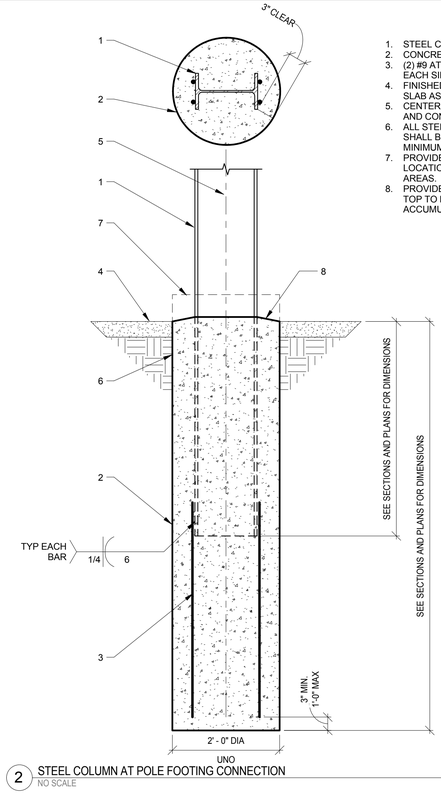
C-SHAPES
- 16 GAUGE - 0.773 INCHES
- 14 GAUGE - 0.800 INCHES
- 12 GAUGE - 0.885 INCHES

9 TYPICAL COLD FORMED STEEL PURLIN SECTION
NO SCALE



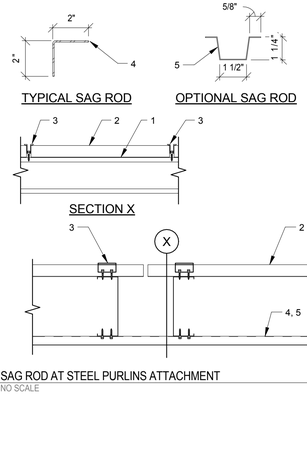
1. STEEL BEAM, FOR TILT DIRECTION SEE SECTIONS. STEEL BEAM SHALL BARE COMPLETELY ON STEEL COLUMN. A MAXIMUM 1/2" GAP IS ACCEPTABLE WITHOUT REPAIR. IF THE GAP BETWEEN THE TOP OF COLUMN AND BEARING BEAM FLANGE EXCEEDS 1/2" STEEL SHIMS SHALL BE PROVIDED.
2. STEEL COLUMN
3. 1 1/4"x7"x20" (LSV) STEEL HODGE PLATE EACH SIDE OF W14X61 AND W12X65 COLUMNS; 1"x7"x15" (LSV) STEEL HODGE PLATE EACH SIDE OF W14x43 AND W12X58 COLUMNS (Fy = 50 KSI MINIMUM).
4. 1/2" FULL DEPTH WEB STIFFENERS EACH SIDE OF COLUMN, AS SHOWN TYP.
5. WELD 3 SIDES ALL AROUND HODGE PLATE TO COLUMN (EACH SIDE AND BOTTOM OF PLATE). STOP WELD 1/2" FROM TOP OF COLUMN.

5 STEEL BEAM TO STEEL COLUMN CONNECTION
NO SCALE



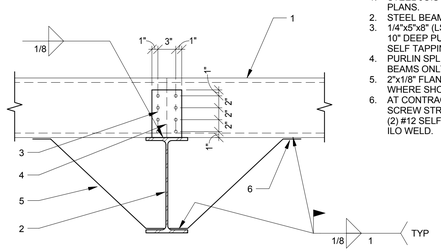
1. STEEL COLUMN.
2. CONCRETE POLE FOOTING
3. (2) #9 AT 4" O.C. WELDED TO EACH SIDE OF COLUMN.
4. FINISHED GRADE, ASPHALT OR SLAB AS OCCURS.
5. CENTERLINE OF STEEL COLUMN AND CONCRETE FOOTING.
6. ALL STEEL BELOW GRADE SHALL BE ENCASED IN 3" MINIMUM CONCRETE.
7. PROVIDE 6" EXPOSED PIER AT LOCATIONS OUTSIDE PAVED AREAS.
8. PROVIDE SLOPPED SURFACE AT TOP TO PREVENT ACCUMULATION OF WATER.

2 STEEL COLUMN AT POLE FOOTING CONNECTION
NO SCALE



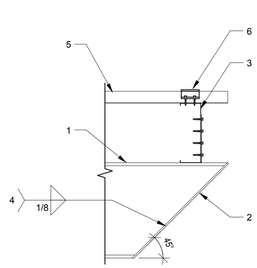
1. COLD FORMED STEEL PURLIN.
2. SOLAR PANELS BY OTHERS.
3. SOLAR CLAMP PER OTHER DETAILS.
4. L2"x2"x14 GAUGE STEEL SAG ANGLE WHERE SHOWN ON PLANS. ATTACH WITH (2) #12 SELF DRILLING SCREWS AT EACH PURLIN.
5. AT CONTRACTORS OPTION, USE 1 1/2" X 1 1/4" X 18 GAUGE STEEL HAT CHANNEL SAG ROD IN LEIU OF L2"x2"X14 GAUGE STEEL SAG ROD.

10 SAG ROD AT STEEL PURLINS ATTACHMENT
NO SCALE



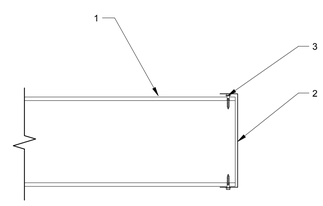
1. STEEL JOIST PURLIN PER PLANS.
2. STEEL BEAM.
3. 1/4"x5"x8" (LSV) STEEL PLATE AT 10" DEEP PURLINS WITH (8) #12 SELF TAPPING SCREWS.
4. PURLIN SPLICE AT INTERIOR BEAMS ONLY.
5. 2"x1/8" FLANGE BRACE STRAP WHERE SHOWN ON PLANS.
6. AT CONTRACTORS OPTION, SCREW STRAP TO PURLIN WITH (2) #12 SELF TAPPING SCREWS ILO WELD.

6 TYPICAL PURLIN TO STEEL BEAM CONNECTION
NO SCALE



1. STEEL BEAM.
2. 1/8" STEEL CAP PLATE.
3. STEEL PURLIN, ATTACH TO BEAM PER OTHER DETAILS.
4. WELD 2" MINIMUM EACH FLANGE AND WEB.
5. SOLAR PANELS BY OTHERS.
6. SOLAR CLAMP PER OTHER DETAILS.

11 TYPICAL PURLIN TO STEEL BEAM CONNECTION
NO SCALE



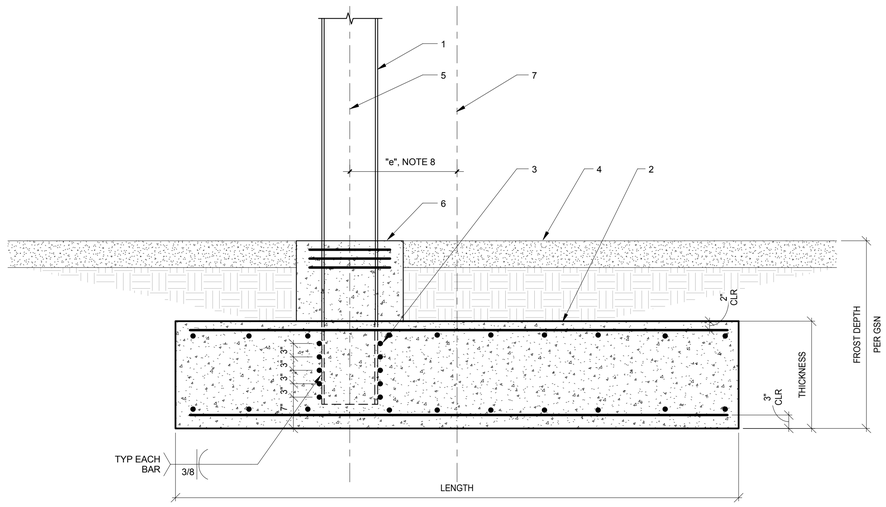
1. COLD FORMED STEEL PURLIN.
2. END CAP PER PLANS.
3. (1) #12 SELF DRILLING SCREWS TOP AND BOTTOM AT EACH PURLIN (2 - TOTAL EACH PURLIN).

12 TYPICAL PURLIN END CAP DETAIL
NO SCALE

FOOTING SCHEDULE

NOTE:
IF FIELD DIMENSION OF FOOTING IS LARGER THAN SHOWN IN SCHEDULE, CONTRACTOR TO PLACE ADDITIONAL REINFORCING TO MAINTAIN ACI 318 MINIMUM AREA OF STEEL REQUIREMENTS.

STRUCTURE	FOOTING SIZE (LENGTH x WIDTH x THICKNESS)	FOOTING ECCENTRICITY "e"	FOOTING REINFORCING	CONCRETE STRENGTH
6 PANEL	12'-0"x6'-0"x2'-0"	0'-0"	#6 AT 10" O.C. EACH WAY TOP AND BOTTOM	4,500 PSI
4 PANEL	12'-0"x6'-0"x2'-0"	1'-6"	#6 AT 10" O.C. EACH WAY TOP AND BOTTOM	4,500 PSI



1. STEEL COLUMN.
2. CONCRETE SPREAD FOOTING, SEE SCHEDULE THIS DETAIL FOR SIZE AND REINFORCING.
3. (5) #9 x 5'-0" BARS AT 3" O.C. VERTICAL WELDED TO EACH SIDE OF COLUMN FLANGE (6- TOTAL PER COLUMN).
4. FINISHED GRADE (SLAB OR ASPHAULT AS OCCURS).
5. CENTERLINE OF STEEL COLUMN AND CONCRETE FOOTING WIDTH.
6. CONCRETE CLOSURE POUR. WITH (3) #4 TIES WITHIN TOP 6". PROVIDE 3" MINIMUM CONCRETE COVER FOR ALL STEEL BELOW GRADE.
7. CENTERLINE OF FOOTING LENGTH.
8. OFFSET COLUMN PER FOOTING SCHEDULE. WHERE FOOTING ECCENTRICITY EXISTS, LONGER FOOTING TOE SHALL OCCUR ON THE SAME SIDE OF THE COLUMN.

8 STEEL COLUMN AT CONCRETE SPREAD FOOTING
NO SCALE

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STATE OF CONNECTICUT
JOHN "B." ELDER
No. 32165
LICENSED PROFESSIONAL ENGINEER
10/17/2018

Skyline Solar of AZ
A DIVISION OF SKYLINE STEEL, LLC

Taubman Westfarms Mall

West Hartford, CT 06110

No.	Description	Date

PROJECT NUMBER:	18001.005
DRAWN BY:	DB
CHECKED BY:	JE
DATE:	10/17/2018

SHEET NAME
DETAILS

S4.1

2,729.60 KW SOLAR ROOFTOP & CARPORT SYSTEM AT

TAUBMAN WESTFARMS MALL

1500 NEW BRITAIN AVENUE, WEST HARTFORD, CT 06110

LOCATION MAP
SCALE: 1"=1000'-0"

BIRDS-EYE VIEW FROM NORTH
SCALE: 1"=1000'-0"

SYSTEM PLAN
SCALE: 1"=200'-0"

TOTAL SYSTEM SUMMARY:

TOTAL DC SYSTEM SIZE:	2,729.60 kWDC
AC SYSTEM SIZE:	2,032.80 kWAC
MODULE MANUFACTURER:	LG ELECTRONICS
MODULE MODEL:	LG 400N2W-A5
MODULES PER STRING:	36/34/18/17/16
MODULE QUANTITY:	6824
STRING QUANTITY:	27/21/59/44/208

CARPORT EQUIPMENT:

INVERTER MANUFACTURER:	SOLECTRIA RENEWABLES
INVERTER MODEL (QUANTITY):	SOLECTRIA PVI60TL (16)
	SOLECTRIA PVI36TL (15)

ROOFTOP EQUIPMENT:

INVERTER MANUFACTURER:	SOLAREDGE TECHNOLOGIES
INVERTER MODEL (QUANTITY):	SOLAREDGE SE33.3KUS (16)
DC OPTIMIZER MODEL (QUANTITY):	SOLAREDGE P850 (843)

SUBSYSTEM SUMMARIES:

SYSTEM A - ELECTRICAL ROOM E

TOTAL DC SIZE:	674.40 kWDC
AC SYSTEM SIZE:	532.80 kWAC
MODULE QUANTITY:	1686
STRING QUANTITY:	48
MODULE TILT:	5°
MODULE AZIMUTH:	197°/173°

SYSTEM B - ELECTRICAL ROOM B

TOTAL DC SIZE:	688.80 kWDC
AC SYSTEM SIZE:	516.00 kWAC
MODULE QUANTITY:	1722
STRING QUANTITY:	100
MODULE TILT:	5°/-1°
MODULE AZIMUTH:	197°

SYSTEM C - ELECTRICAL ROOM B

TOTAL DC SIZE:	1366.40 kWDC
AC SYSTEM SIZE:	984.00 kWAC
MODULE QUANTITY:	3416
STRING QUANTITY:	211
MODULE TILT:	3°/-3°
MODULE AZIMUTH:	107°/197°

SCOPE OF WORK SUMMARY

ROOFTOP PV ARRAY:
INSTALL SOLAR MODULES AND ROOFTOP BALLASTED RACKING SYSTEM ON TOP OF EXISTING BUILDING. INSTALL INVERTERS AND ELECTRICAL DISTRIBUTION EQUIPMENT AND INTERCONNECT AT EXISTING MAIN ELECTRICAL DISTRIBUTION EQUIPMENT.

CARPORT PV ARRAY:
INSTALL SOLAR MODULES AND CARPORT STRUCTURE AT EXISTING PARKING LOT. INSTALL INVERTERS AND ELECTRICAL DISTRIBUTION EQUIPMENT ON CONCRETE PAD TO INTERCONNECT AT EXISTING ELECTRICAL DISTRIBUTION EQUIPMENT.

DEVELOPER:

Safari Energy

1407 BROADWAY, 24TH FLOOR
NEW YORK, NY 10018

ENGINEERED BY:

PUREPOWER ENGINEERING

5 MARINE VIEW PLAZA, SUITE 301
HOBOKEN, NEW JERSEY, 07030

DRAWING INDEX

		DESIGN DEVELOPMENT	CONSTRUCTION DOCUMENTS	08/21/2018	10/15/2018
GENERAL					
G001	TITLE SHEET	●	●		
G100	SITE PLAN	●	●		
G200	OVERALL ARRAY PLAN - ROOF	●	●		
G201	ARRAY PLAN SYSTEM A - NORTH ROOF	●	●		
G202	ARRAY PLAN SYSTEM A - SOUTH ROOF	●	●		
G203	ARRAY PLAN SYSTEMS B & C CARPORT	●	●		
G300	FIRE ACCESS PLAN - ROOF	●	●		
ELECTRICAL					
E001	ELECTRICAL NOTES & SYMBOL LIST	●	●		
E100	OVERALL ELECTRICAL PLAN	●	●		
E101	ELECTRICAL PLAN ROOF SYSTEM A	●	●		
E102	ELECTRICAL PLAN CARPORT SYSTEMS B & C	●	●		
E105	CONDUIT ROUTING PLAN		●		
E110	ELECTRICAL ROOM PLANS	●	●		
E111	INVERTER AREA PLANS	●	●		
E150	LIGHTING PHOTOMETRIC PLAN	●	●		
E151	LIGHTING CIRCUIT PLAN		●		
E200	DC ELECTRICAL PLAN SYSTEM A - NORTH ROOF	●	●		
E201	DC ELECTRICAL PLAN SYSTEM A - SOUTH ROOF	●	●		
E202	DC ELECTRICAL PLAN SYSTEM B - NORTH CARPORT	●	●		
E203	DC ELECTRICAL PLAN SYSTEM C - SOUTH CARPORT	●	●		
E300	ONE LINE DIAGRAM - SYSTEM A	●	●		
E301	ONE LINE DIAGRAM - SYSTEM B	●	●		
E302	ONE LINE DIAGRAM - SYSTEM C	●	●		
E310	SCHEDULES & CALCULATIONS	●	●		
E311	SCHEDULES & CALCULATIONS	●	●		
E401	GROUNDING DETAILS	●	●		
E402	ELECTRICAL DETAILS	●	●		
E500	LABELS & SIGNAGE	●	●		
E501	LABELS & SIGNAGE	●	●		
E600	EQUIPMENT DATA SHEETS	●	●		
E601	EQUIPMENT DATA SHEETS	●	●		
E700	MONITORING SYSTEM A	●	●		
E701	MONITORING SYSTEMS B & C	●	●		

LEGEND:

UPDATED DRAWING ISSUED	●
UNCHANGED, PREVIOUSLY ISSUED DRAWING STILL CURRENT	○
DRAWING REMOVED FROM SET	×

DRAWING TITLE: TITLE SHEET

1 OF 32

DRAWING # G001

DATE	REVISION DESCRIPTION	PM	ENG CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC RI

PUREPOWER ENGINEERING
5 MARINE VIEW PLAZA, SUITE 301, HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. NINIS
CT LICENSE No. 0023462

SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK, 10018
WWW.SAFARIENERGY.COM

DEVELOPER: Safari Energy

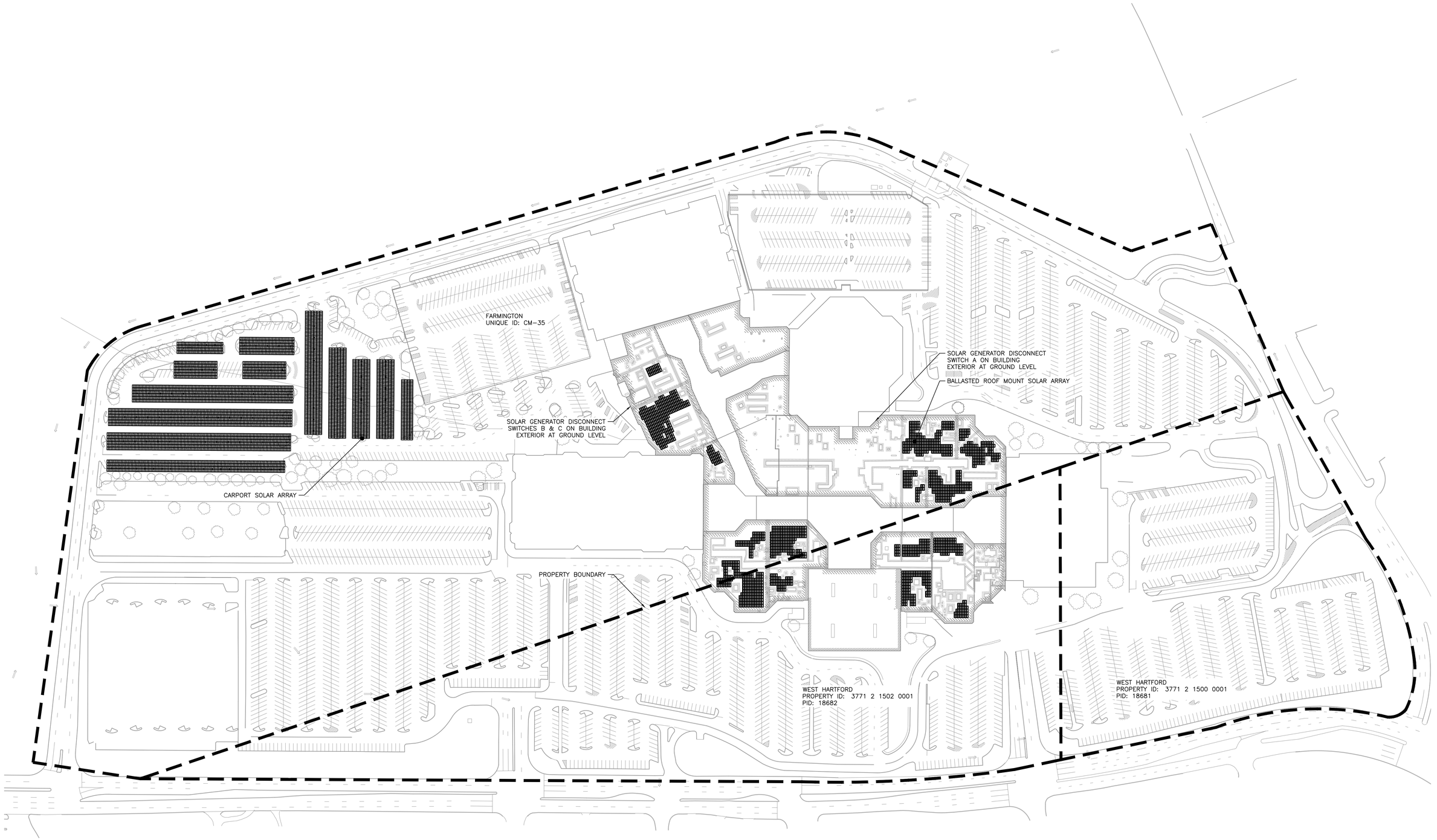
PAGE SIZE: 36" x 24"
PROJECT #: PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 320
ORIENTATION: VARIES

PROJECT: 2729.60KW SOLAR SYSTEM AT TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

PLOT DATE: 10/22/2018 2:12 PM

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18



1 G100 SITE PLAN
SCALE: 1" = 100'-0"

DRAWING TITLE: SITE PLAN

DEVELOPER
Safari Energy
SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK 10018
WWW.SAFARIENERGY.COM

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BK	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BK	CC	RI

PUREPOWER
ENGINEERING
5 MARINE VIEW PLAZA HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. WINDS
CT LICENSE No. 0003982

ENGINEER'S CERTIFICATION
RICHARD A. WINDS
CONNECTICUT
PROFESSIONAL ENGINEER

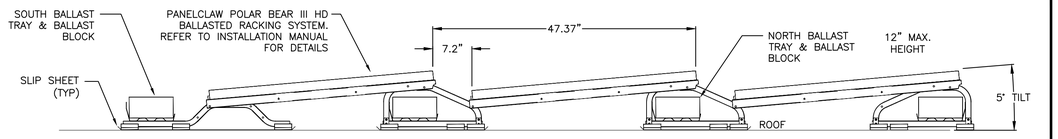
DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: VAR
ORIENTATION: VARIES

PAGE SIZE: 36" x 24"
PROJECT #: PPE 18.087

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

2 OF 32

DRAWING #
G100



2 G200 RACKING DETAIL
SCALE: NONE

MACY'S

LORD & TAYLOR

MACY'S

JC PENNY

2 G200

8FT WIDE FIRE PATH EVERY 150FT OF ARRAY PER FIRE CODE

BALLASTED ROOF MOUNT ARRAY (TYPICAL)

12FT SNOW DRIFT SETBACK

6FT SETBACK FROM ROOF EDGE

4FT SETBACK FROM HVAC EQUIPMENT

SYSTEM A SUMMARY:

DC SYSTEM SIZE:	674.40
AC SYSTEM SIZE:	532.80
TILT:	5°
AZIMUTH:	197°/173°

IMPORTANT:
DO NOT STEP OR KNEEL ON PV MODULES

1 G200 OVERALL ARRAY PLAN – ROOF
SCALE: 1" = 50'-0"

N

PLOT DATE: 10/22/2018 2:12 PM

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

PUREPOWER ENGINEERING
5 MARINE VIEW PLAZA, HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. WINS
CT LICENSE No. 0023462

ENGINEER'S CONNECTICUT SEAL
RICHARD A. WINS
REGISTERED PROFESSIONAL ENGINEER

SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK, 10018
WWW.SAFARIENERGY.COM

PROJECT:
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

DEVELOPER: Safari Energy

PAGE SIZE: 36" x 24"
PROJECT #: PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 328
ORIENTATION: VARIES

DRAWING TITLE
OVERALL ARRAY PLAN – ROOF

3 OF 32
DRAWING # G200

CONTINUED ON PLAN G202

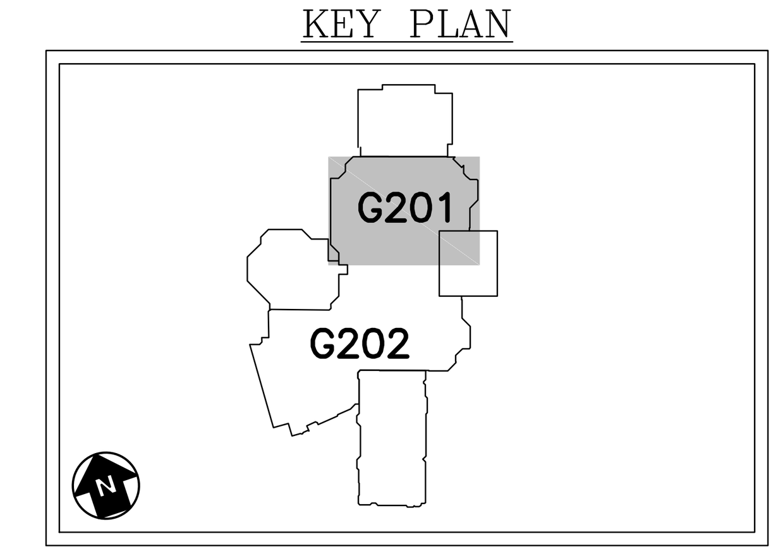
NOTE: DIMENSIONS ARE APPROXIMATE AND SHOWN TO RACKING RAILS.

IMPORTANT:
DO NOT STEP OR KNEEL ON PV MODULES

1 / G201 ARRAY PLAN – SYSTEM A NORTH ROOF
SCALE: 1" = 20'-0"

LEGEND (EXISTING ITEMS):
- A ACCESS HATCH
- G GAS PIPE
- H HVAC
- L SKYLIGHT
- V VENT

KEY PLAN



RULER IN INCHES:

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

ENGINEER
PUREPOWER ENGINEERING
5 MARINE VIEW PLAZA HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. IVINS
CT LICENSE No. 0029262

DEVELOPER
Safari Energy
SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK 10018
WWW.SAFARIENERGY.COM

PAGE SIZE 36" x 24"
PROJECT # PPE 18.087

DC SYSTEM SIZE:	2729.60 kW
AC SYSTEM SIZE:	2032.80 kW
MODULE:	LG400N2W-A5
MODULE QUANTITY:	6824
STRING QUANTITY:	329
ORIENTATION:	VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

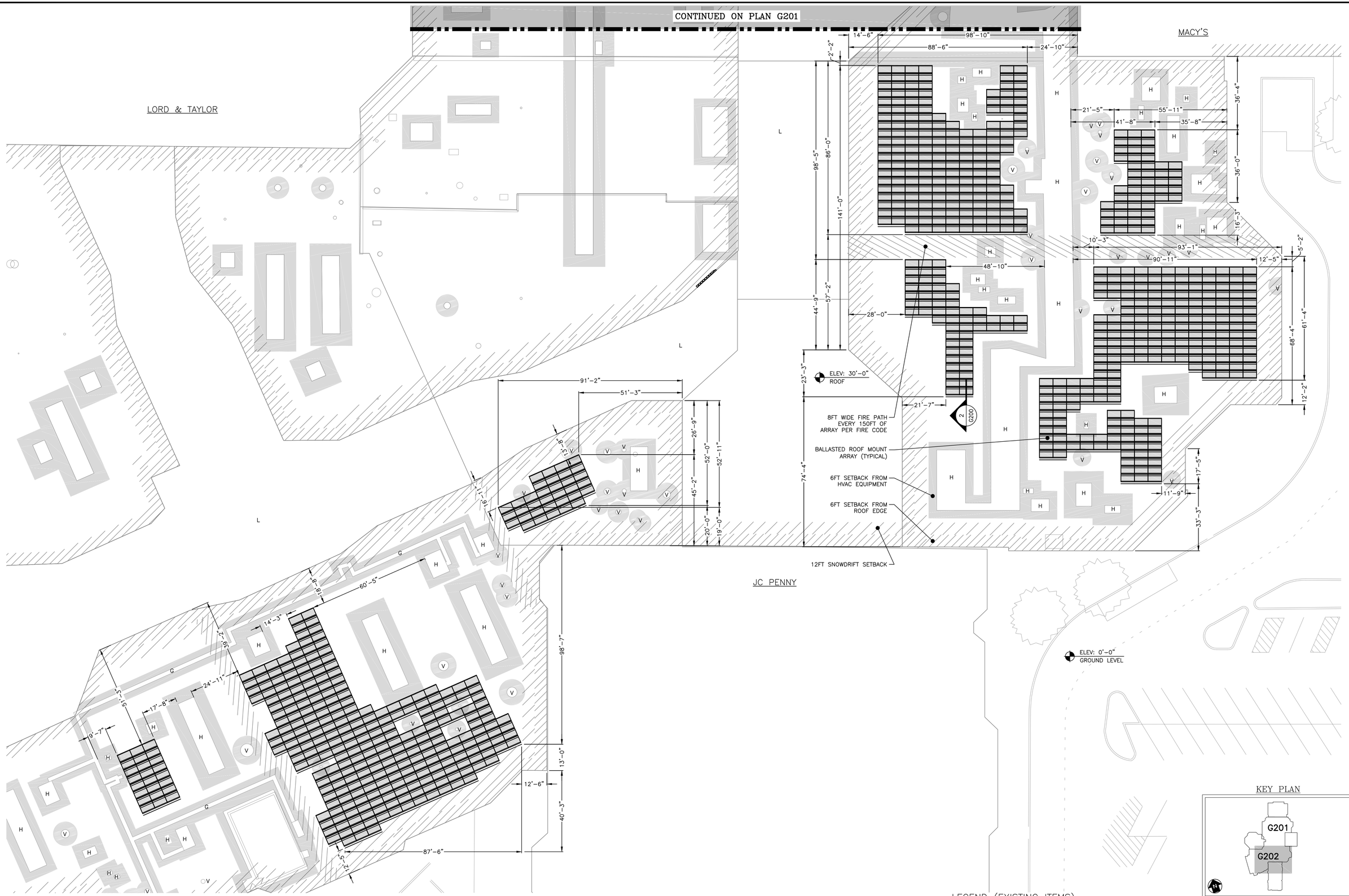
DRAWING TITLE
ARRAY PLAN SYSTEM A NORTH ROOF

DRAWING #
G201

LORD & TAYLOR

MACY'S

JC PENNY



NOTE: DIMENSIONS ARE APPROXIMATE AND SHOWN TO RACKING RAILS.

IMPORTANT:
DO NOT STEP OR KNEEL ON PV MODULES

1 G202 ARRAY PLAN – SYSTEM A SOUTH ROOF
SCALE: 1" = 20'-0"

LEGEND (EXISTING ITEMS):

A	ACCESS HATCH
D	DRAIN
E	EXPANSION JOINT
G	GAS PIPE
H	HVAC
L	SKYLIGHT
V	VENT

KEY PLAN

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

PUREPOWER
ENGINEERING
5 MARINE VIEW PLAZA HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. WINS
CT LICENSE No. 0023862

DEVELOPER: Safari Energy

PAGE SIZE: 36" x 24"
PROJECT #: PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 328
ORIENTATION: VARIES

PROJECT:
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK 10018
WWW.SAFARIENERGY.COM

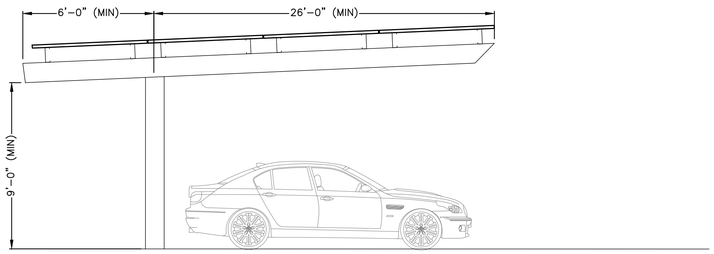
DRAWING TITLE
ARRAY PLAN SYSTEM A
SOUTH ROOF

5 OF 32

DRAWING #
G202

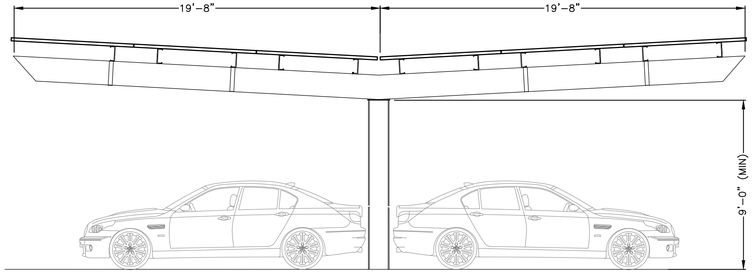
PLOT DATE: 10/22/2018 2:12 PM

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18



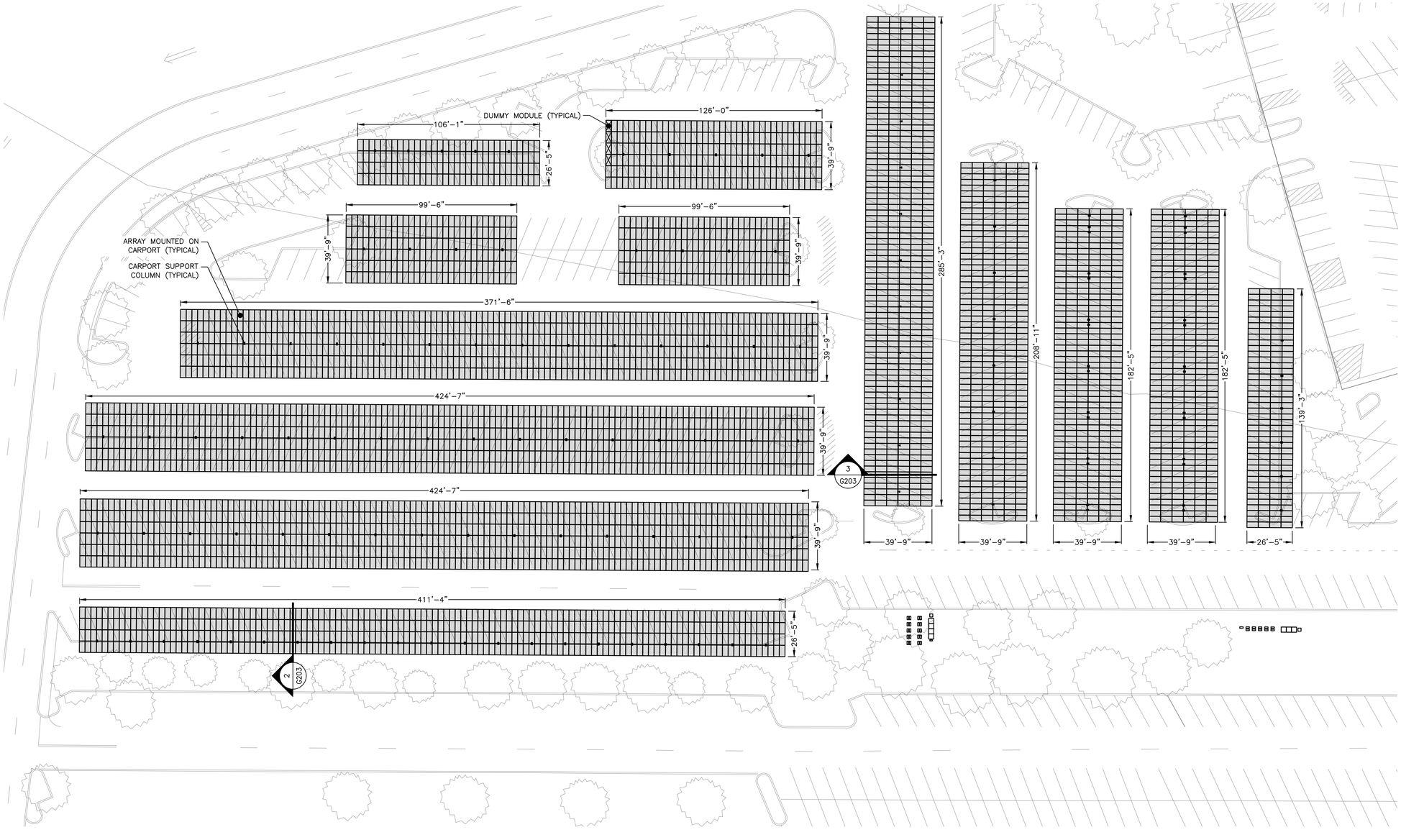
NOTE: CARPORT HEIGHTS VARY. SEE STRUCTURAL DRAWINGS FOR FULL DETAILS

2 G203 CARPORT ELEVATION
SCALE: NONE



NOTE: CARPORT HEIGHTS VARY. SEE STRUCTURAL DRAWINGS FOR FULL DETAILS

3 G203 CARPORT ELEVATION
SCALE: NONE



SYSTEM B SUMMARY:

DC SYSTEM SIZE:	688.80 kWDC
AC SYSTEM SIZE:	516.00 kWAC
MODULE TILT:	1°/3°
MODULE AZIMUTH:	197°

SYSTEM C SUMMARY:

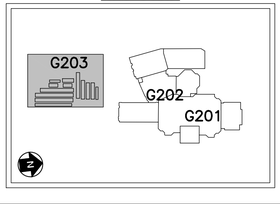
DC SYSTEM SIZE:	1366.40 kWDC
AC SYSTEM SIZE:	984.00 kWAC
MODULE TILT:	3°/-3°
MODULE AZIMUTH:	107°/197°

1 G203 ARRAY PLAN – SYSTEMS B & C CARPORTS
SCALE: 1" = 30'-0"

NOTE: DIMENSIONS ARE APPROXIMATE AND SHOWN TO MODULES.

IMPORTANT:
DO NOT STEP OR KNEEL ON PV MODULES

KEY PLAN



DRAWING TITLE
ARRAY PLAN
SYSTEMS B & C CARPORT

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

PUREPOWER
PURE ENERGY
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RICHARD A. WINDS
CT LICENSE No. 0623462

DEVELOPER
Safari Energy

PAGE SIZE 36" x 24"
PROJECT # PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 284
ORIENTATION: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK 10018
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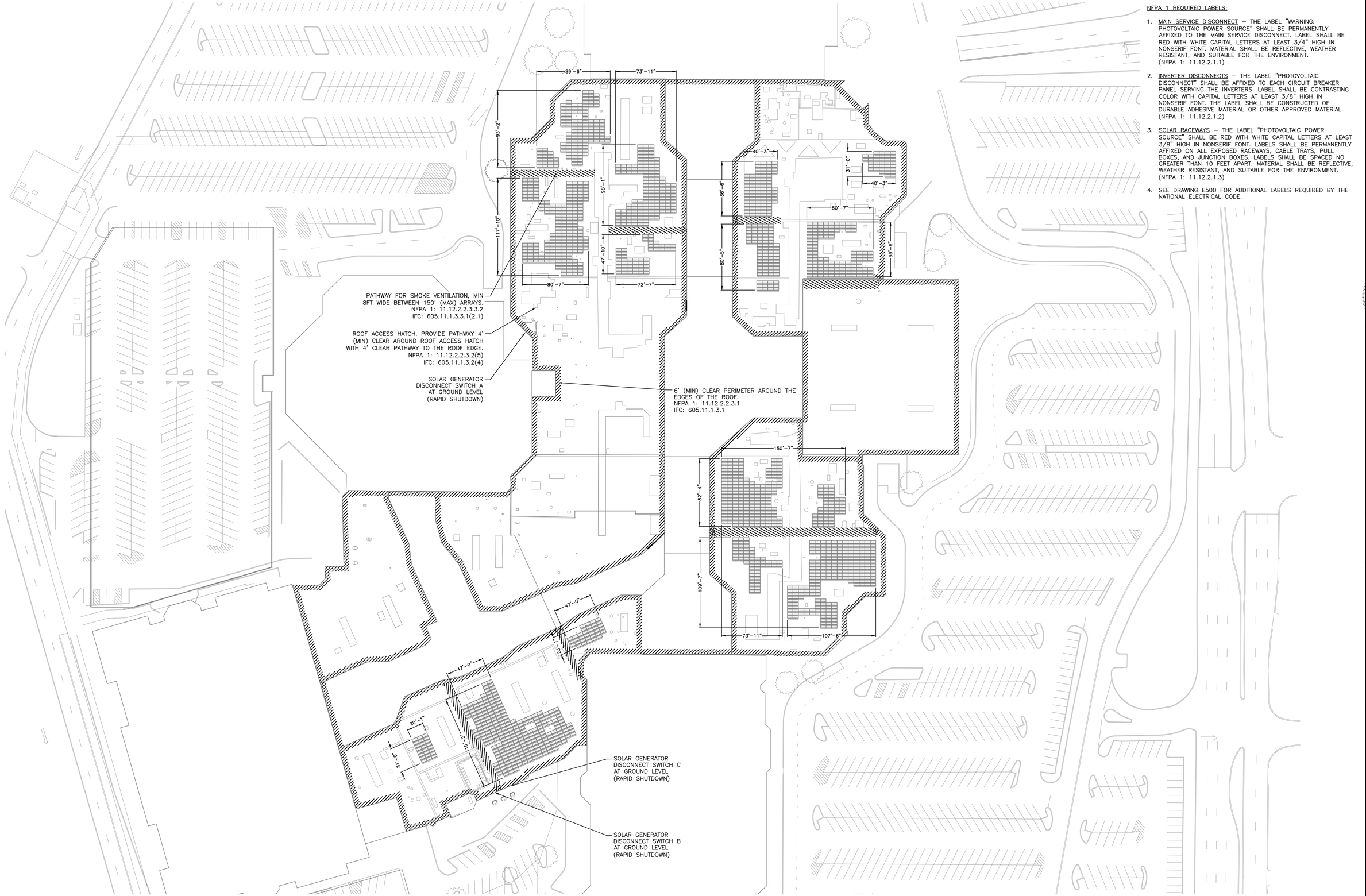
6 OF 32

DRAWING # G203

PLOT DATE: 10/22/2018 2:12 PM

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18



1 G300 FIRE ACCESS PLAN – ROOF
SCALE: 1" = 50'-0"

NFPA 1 REQUIRED LABELS:

1. MAIN SERVICE DISCONNECT – THE LABEL "WARNING: PHOTOVOLTAIC POWER SOURCE" SHALL BE PERMANENTLY AFFIXED TO THE MAIN SERVICE DISCONNECT. LABEL SHALL BE RED WITH WHITE CAPITAL LETTERS AT LEAST 3/4" HIGH IN NONSERIF FONT. MATERIAL SHALL BE REFLECTIVE, WEATHER RESISTANT, AND SUITABLE FOR THE ENVIRONMENT. (NFPA 1: 11.12.2.1.1)
2. INVERTER DISCONNECTS – THE LABEL "PHOTOVOLTAIC DISCONNECT" SHALL BE AFFIXED TO EACH CIRCUIT BREAKER PANEL SERVING THE INVERTERS. LABEL SHALL BE CONTRASTING COLOR WITH CAPITAL LETTERS AT LEAST 3/8" HIGH IN NONSERIF FONT. THE LABEL SHALL BE CONSTRUCTED OF DURABLE ADHESIVE MATERIAL OR OTHER APPROVED MATERIAL. (NFPA 1: 11.12.2.1.2)
3. SOLAR RACEWAYS – THE LABEL "PHOTOVOLTAIC POWER SOURCE" SHALL BE RED WITH WHITE CAPITAL LETTERS AT LEAST 3/8" HIGH IN NONSERIF FONT. LABELS SHALL BE PERMANENTLY AFFIXED ON ALL EXPOSED RACEWAYS, CABLE TRAYS, PULL BOXES, AND JUNCTION BOXES. LABELS SHALL BE SPACED NO GREATER THAN 10 FEET APART. MATERIAL SHALL BE REFLECTIVE, WEATHER RESISTANT, AND SUITABLE FOR THE ENVIRONMENT. (NFPA 1: 11.12.2.1.3)
4. SEE DRAWING E500 FOR ADDITIONAL LABELS REQUIRED BY THE NATIONAL ELECTRICAL CODE.

DATE	REVISION DESCRIPTION	PM	ENG	CHK
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08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

PUREPOWER ENGINEERING
5 MARINE VIEW PLAZA, HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. WINS
CT LICENSE No. 0023462

ENGINEER'S CONNECTICUT SEAL

DEVELOPER: Safari Energy

PAGE SIZE: 36" x 24"
PROJECT #: PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 324
ORIENTATION: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK 10018
WWW.SAFARIENERGY.COM

DRAWING TITLE
FIRE ACCESS PLAN

7 OF 32
DRAWING # G300

PLOT DATE: 10/22/2018 2:12 PM
RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

PLOT DATE: 10/22/2018 2:12 PM

ELECTRICAL NOTES

ALL WORK AND MATERIALS SHALL BE IN FULL ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND SHALL BE UNDERWRITERS LABORATORIES (UL) LABELED. THE CONTRACTOR SHALL PROCURE ALL NECESSARY CERTIFICATIONS FOR ALL WORK INSTALLED, PAY ALL FEES AND CHARGES CONNECTED THEREWITH AND DELIVER ALL CERTIFICATES AND INSPECTION APPROVALS TO THE OWNER THROUGH THE ENGINEER, BEFORE HIS WORK WILL BE FINALLY ACCEPTED.

ALL INVERTERS SHALL BE IEEE 1547 COMPLIANT AND SHALL BE INSPECTED BY LOCAL UTILITY BEFORE COMMISSIONING, TESTING AND OPERATION OF THE SYSTEM.

NEW EQUIPMENT SHALL HAVE AN INTERRUPT RATING (kAIC) GREATER THAN OR EQUAL TO THE EXISTING EQUIPMENT.

MANNER OF INSTALLATION

ALL WORK SHALL BE INSTALLED IN A FIRST CLASS, NEAT AND WORKMANLIKE MANNER BY MECHANICS SKILLED IN THE TRADE INVOLVED. ALL DETAILS OF THE INSTALLATION SHALL BE MECHANICALLY AND ELECTRICALLY CORRECT.

TORQUE AND MARK ALL RACKING AND MECHANICAL LUGS.

CONDUCTORS AND CONDUCTOR INSTALLATION

COMPRESSION LUGS SHALL BE USED ON ALL ALUMINUM CABLE TERMINATIONS. MECHANICAL LUGS MAY ONLY BE USED FOR COPPER CABLE TERMINATIONS.

IF ALUMINUM MC CABLE IS USED, THHN/THWN-2 INSULATION IS ACCEPTABLE. FOR ALUMINUM CONDUCTORS XHHW-2 SHALL BE USED.

NO-LOX TO BE USED WITH ALL ALUMINUM LUGS.

PV SYSTEM CONDUCTORS SHALL BE MARKED AND IDENTIFIED PER NEC 690.31(B).

INSTALL WIRE AND CABLE IN ACCORDANCE WITH THE NEC AND AS HEREINAFTER SPECIFIED. USE THE NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION'S "STANDARD OF INSTALLATION", THE MANUFACTURER'S WRITTEN INSTRUCTIONS, UNLESS SUPERSEDED BY THESE SPECIFICATIONS. IN ALL CASES THE INSTALLATION SHALL BE IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES.

THE USE OF WIRE SPLICES AT ANY POINT IN THE INSTALLATION IS STRICTLY PROHIBITED.

THE USE OF WIRE LUBE IS REQUIRED FOR ALL WIRE PULLS THROUGH CONDUIT RUNS OF 20' OR LONGER, OR WITH BENDS IN 180° OR MORE. WIRE LUBE IS REQUIRED EVEN WHEN USING SELF LUBRICATING CABLES SUCH AS SOUTHWIRE 'SIMPULL'.

STRING WIRING & HOMERUNS SHALL BE SECURED TO UNDERSIDE OF THE RACKING & MODULES USING ZIP TIES OUTDOOR RATED FOR UV. HELLERMAN TYTON PA66UV OR EQUAL. TRANSITION TO EMT OUTSIDE OF ARRAY.

PHASE RELATIONSHIP

CONNECT FEEDERS TO MAINTAIN PHASE RELATIONSHIP THROUGH SYSTEM. PHASE LEGS OF FEEDERS SHALL MATCH BUS OR CABLE ARRANGEMENTS IN EQUIPMENT TO WHICH THE FEEDERS ARE CONNECTED. COLOR CODING SHALL BE AS FOLLOWS:

208/120 VAC
A PHASE: BLACK, B PHASE: RED, C PHASE: BLUE

277/480 VAC
A PHASE: BROWN, B PHASE; ORANGE, C PHASE: YELLOW

1000 VDC OR 600 VDC
UNGROUNDED POSITIVE CONDUCTOR: RED
UNGROUNDED NEGATIVE CONDUCTOR: BLACK
AC AND DC SYSTEMS:
GROUNDED CONDUCTOR: WHITE
GROUND: GREEN

WHERE COLOR CODED CABLE IS NOT USED, TAPE CONDUCTOR WITH OVERLAPPED COLORED TAPE FOR A MINIMUM OF 6" IN ACCESSIBLE LOCATIONS. COLOR CODING MUST BE USED CONSISTENTLY FOR THE ENTIRE PROJECT.

CONDUITS AND RACEWAYS

PROVIDE RACEWAYS MINIMUM SIZE 3/4".

CONDUITS SHALL BE EMT WHERE NOT SUBJECT TO PHYSICAL DAMAGE. CONDUITS SHALL BE IMC OR RMC WHERE SUBJECT TO PHYSICAL DAMAGE. PVC CONDUITS ONLY PERMITTED IN BELOW GRADE DUCT BANKS.

DRAWINGS SHOW RACEWAY LOCATIONS DIAGRAMMATICALLY. CONTRACTOR SHALL ADJUST ROUTING TO SUIT FIELD LOCATIONS. ANY CHANGES TO PROPOSED ROUTING SHALL BE SUBMITTED TO ENGINEER FOR REVIEW AND APPROVAL.

FURNISH AND INSTALL ALL FITTINGS AND SPECIAL DEVICES NECESSARY FOR THE PROPER INSTALLATION, CONNECTION AND OPERATION OF THE SYSTEM. CONDUIT ELBOWS SHALL BE OF THE SAME MAKE, QUALITY AND FINISH AS THE CONDUIT USED.

PROVIDE 2 PROTECTIVE COATS OF ASPHALTUM COMPOUND FOR ANY GALVANIZED STEEL CONDUITS DIRECTLY BURIED IN EARTH.

EMT CONDUIT SHALL USE COMPRESSION RAINTIGHT CONNECTORS, FACTORY STAMPED RAINTIGHT WITH COMPONENTS PROPERLY INSTALLED.

PROVIDE EXPANSION FITTINGS WITH BONDING JUMPERS FOR EVERY 100' OF STRAIGHT METAL CONDUIT RUN.

CONDUIT EXPANSION AND DEFLECTION FITTINGS WITH BONDING JUMPERS SHALL BE USED WHENEVER CROSSING BUILDING EXPANSION AND SEISMIC SEPARATION JOINTS.

LEAVE WIRE SUFFICIENTLY LONG TO PERMIT MAKING FINAL CONNECTIONS. ALL EMPTY CONDUITS OVER 10' IN LENGTH SHALL BE PROVIDED WITH SYNTHETIC FIBER ROPE PULL WIRE.

PATCH AND REPAIR ALL SURFACES DAMAGED BY TRENCHING TO MATCH THE PREVIOUSLY EXISTING CONDITIONS.

15" WIDE OR LESS BUCKET TO BE USED FOR TRENCHING.

ALL PENETRATIONS SHALL BE SEALED TO MAINTAIN THE EXISTING FIRE RATING.

ALL ROOFTOP CONDUITS SHALL BE MARKED PER LOCAL FIRE CODES.

ELECTRICAL ENCLOSURES

ALL OUTDOOR ENCLOSURES (PANELBOARDS, DISCONNECT SWITCHES, JUNCTION BOXES, COMBINER BOXES, ETC.) SHALL BE NEMA 3R, 4, OR 4X. INDOOR ENCLOSURES SHALL BE NEMA 1.

PANELBOARD DOORS SHALL BE QUARTER TURN LATCHES OR EXTERNAL HANDLE WITH INTERNAL LATCHES, NO SETS OF EXTERNAL SCREW DOWN CLAMPS.

CONDUIT TERMINATING IN OUTDOOR ENCLOSURES SHALL USE MYERS-TYPE HUBS WITH GROUND SCREW. UTILIZE RAINTIGHT FITTINGS FOR ALL CABLE ENTRIES.

NO PENETRATIONS OR CABLE ENTRIES IN THE TOP OF OUTDOOR ENCLOSURES. ENTER OUTDOOR ENCLOSURES FROM THE BOTTOM (PREFERRED) OR SIDE.

ALL ELECTRICAL EQUIPMENT SHALL BE LISTED OR LABELED BY A RECOGNIZED TESTING AGENCY.

ARC FLASH HAZARD WARNING LABELS SHALL BE PROVIDED AND MOUNTED ON EVERY COMBINER BOX, TERMINAL BOX, INVERTER, AC AND DC SWITCH, TRANSFORMER, AND SWITCHGEAR.

HAND HOLES, PULL BOXES, OR CONDUIT BODIES SHALL BE INSTALLED (WHETHER OR NOT SHOWN ON DRAWINGS) WHEN THE RACEWAY HAS MORE THAN 360° OF BENDS, OR AS NECESSARY TO NOT EXCEED MANUFACTURER'S MAXIMUM CABLE PULLING TENSION.

GROUNDING

THE CONTRACTOR SHALL FURNISH AND INSTALL GROUNDING NECESSARY IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

TESTS

FINAL TESTS AND INSPECTION SHALL BE HELD IN THE PRESENCE OF OWNER'S REPRESENTATIVES AND TO THEIR SATISFACTION.

MEGGER ALL: STRING WIRING, COMBINER BOX OUTPUT FEEDERS, AND AC FEEDERS. SUBMIT RESULTS TO OWNER FOR REVIEW.

IV CURVE TRACES OF STRINGS SHALL BE GENERATED USING THE SOLMETRIC PV ANALYZER (OR EQUIVALENT DEVICE) AND SUBMITTED TO OWNER FOR APPROVAL.

GENERAL NOTES

THE GENERAL NOTES APPLY TO ALL DRAWINGS UNDER THE CONTRACT. REFER TO INDIVIDUAL DRAWINGS FOR ADDITIONAL NOTES.

DRAWINGS ARE DIAGRAMS AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. FOLLOW DRAWINGS IN LAYING OUT OF WORK AND CHECK DRAWINGS OF OTHER TRADES TO VERIFY SPACE CONDITIONS. MAINTAIN HEADROOM, SPACE CONDITIONS, AND REQUIRED CLEARANCES.

PV SYSTEM CONTRACTOR SHALL COORDINATE ALL THE WORK WITH THE ENGINEER, THE CONSTRUCTION MANAGER AND ALL OTHER CONTRACTORS TO INSURE THAT THE PV SYSTEM IS INSTALLED AS SPECIFIED IN THESE DRAWINGS.

PERSONAL PROTECTIVE EQUIPMENT (PPE) SHALL BE PROVIDED AS REQUIRED IN ACCORDANCE WITH NEC 70E AND OSHA REQUIREMENTS.

UNFORSEEN OBSTRUCTIONS ON THE ROOF MAY NECESSITATE A CHANGE IN THE LAYOUT. ANY CHANGES TO THE RACKING LAYOUT SHOULD BE REPORTED TO THE ENGINEER. CHANGES IN UP TO 5% OF THE MODULES SHOULD BE ANTICIPATED. CHANGES TO THE ARRAY LAYOUT SHOULD BE MADE AS TO NOT IMPACT THE NUMBER OF MODULES ON A COMBINER BOX OR INVERTER.

LANDSCAPING: RESTORE TO ORIGINAL CONDITIONS.

ALL STRUCTURAL AND MISCELLANEOUS EXTERIOR STEEL, INCLUDING STRUT CHANNEL (SUCH AS UNISTUT OR KINDORF) SHALL BE CORROSION RESISTANT, HOT DIP GALVANIZED OR GALVANNEALED WITH A COATED FINISH MINIMUM.

LEGEND – GENERAL

- LIGHT LINE INDICATES EXISTING OR BEYOND THE SCOPE OF PROJECT
- DARK LINE INDICATES NEW OR WITHIN THE SCOPE OF PROJECT
- DASHED LINE INDICATES EQUIPMENT AT A DIFFERENT ELEVATION
- EXISTING TEXT — LIGHT TEXT INDICATES EXISTING OR BEYOND THE SCOPE OF PROJECT
- NEW TEXT — DARK TEXT INDICATES NEW OR WITHIN THE SCOPE OF PROJECT

LEGEND – PLAN SYMBOLS

- SOLAR MODULE
- RACEWAY TURNING UP OR TOWARDS OBSERVER
- RACEWAY TURNING DOWN OR AWAY FROM OBSERVER
- CABLE TRAY
- P OR P — PULLBOX
- J OR J — JUNCTION BOX
- PANEL BOARD
- TELEPHONE JACK
- DATA JACK
- SIMPLEX RECEPTACLE, RATED: 125-VOLTS AC, 20A
- DUPLEX RECEPTACLE, RATED: 125-VOLTS AC, 20A
- W — WEATHERPROOF DUPLEX RECEPTACLE, RATED: 125-VOLTS AC, 20A
- GFCI — GROUND FAULT CIRCUIT INTERRUPTER DUPLEX RECEPTACLE, RATED: 125-VOLTS AC, 20A
- DOUBLE DUPLEX (QUAD) RECEPTACLE
- CEILING/PENDANT-MOUNT LIGHT, SEE FIXTURE SCHEDULE FOR TYPE
- WALL-MOUNT LIGHT, SEE FIXTURE SCHEDULE FOR TYPE
- GROUND ROD
- GROUND ROD/TEST WELL

LEGEND – ONE LINE DIAGRAM AND WIRING DIAGRAM SYMBOLS

- CIRCUIT BREAKER, FRAME SIZE AND TRIP SETTING AS NOTED
- DISCONNECT SWITCH
- INVERTER
- BUS CONNECTION POINT
- CROSSING POINT (NO CONNECTION)
- NORMALLY CLOSED – NORMALLY OPEN CONTACTS
- TRANSFORMER CONTROL/POWER, SIZE AND RATING AS NOTED
- CURRENT/POTENTIAL TRANSFORMER
- LOCAL DISCONNECT SWITCH
- LOCAL FUSED DISCONNECT SWITCH
- FUSE, SIZE/RATING AS NOTED
- FUSED DISCONNECT SWITCH
- EARTH GROUND
- NC NO — PUSHBUTTON SWITCHES; NUMBER AND TYPE OF CONTACT BLOCKS MAY VARY
- NC NO — PUSHBUTTON SWITCHES MUSHROOM HEAD; NUMBER AND TYPE OF CONTACT BLOCKS MAY VARY

ABBREVIATIONS

A	AMPERES
AF	AMPERE FRAME
A.F.F.	ABOVE FINISH FLOOR
A.F.G.	ABOVE FINISH GRADE
AFDI	ARC FAULT DETECTION & INTERRUPTER
AIC	AMPS INTERRUPTING CAPACITY
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BKR	CIRCUIT BREAKER
C	CONDUIT
CB	COMBINER BOX
CKT	CIRCUIT
CP	CONTROL PANEL
CU	COPPER
DISC	DISCONNECT
EGC	EQUIPMENT GROUNDING CONDUCTOR
ELEC	ELECTRIC, ELECTRICAL
EMERG	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EQUIP	EQUIPMENT
EXIST	EXISTING
G, GND	GROUND
GEC	GROUNDING ELECTRODE CONDUCTOR
GFCI	GROUND-FAULT CIRCUIT INTERRUPTER
GFPE	GROUND-FAULT PROTECTION OF EQUIPMENT
HID	HIGH-INTENSITY DISCHARGE (LIGHTING)
HZ	HERTZ
IMC	INTERMEDIATE METALLIC CONDUIT
kAIC	1000 AMPS INTERRUPT CAPACITY
kCMIL	1000 CIRCULAR MILS
kVA	KILO-VOLT AMPERE
kW	KILOWATT
LA	LIGHTNING & SURGE ARRESTOR
LTG	LIGHTING
LSIG	LONG, SHORT, INSTANTANEOUS, & GROUND FAULT
MAX	MAXIMUM
MFG	MANUFACTURER
MLO	MAIN LUGS ONLY
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NTS	NOT TO SCALE
P	POLE
PF	POWER FACTOR
PLC	PROGRAMMABLE LOGIC CONTROLLER
POI	POINT OF INTERCONNECTION
PRI	PRIMARY
PVC	POLYVINYL CHLORIDE
PWR	POWER
RCPT	RECEPTACLE
RGS	RIGID GALVANIZED STEEL CONDUIT
RMC	RIGID METAL CONDUIT
SEC	SECONDARY
SSBJ	SUPPLY SIDE BONDING JUMPER
ST	SHUNT TRIP
STP	SHIELDED TWISTED PAIR
SW	SWITCH
TBD	TO BE DETERMINED
TP	TWISTED PAIR
TYP	TYPICAL
V	VOLT
VA	VOLT-AMPERE
W	WATT
WP	WEATHERPROOF
XFMR	TRANSFORMER
ø	DIAMETER OR PHASE

NOTES SPECIFIC TO CONNECTICUT

ADOPTED NEC VERSION: 2014

UTILITY: EVERSOURCE

UTILITY DISCONNECT SWITCH REQUIREMENTS:
THE FACILITY SHALL PROVIDE A DISCONNECT SWITCH (OR COMPARABLE DEVICE MUTUALLY AGREED UPON BY THE PARTIES) AT THE POINT OF FACILITY INTERCONNECTION THAT CAN BE OPENED FOR ISOLATION. THE SWITCH SHALL BE IN A LOCATION EASILY ACCESSIBLE TO COMPANY PERSONNEL AT ALL TIMES. THE SWITCH SHALL BE GANG OPERATED, HAVE A VISIBLE BREAK WHEN OPEN, BE RATED TO INTERRUPT THE MAXIMUM GENERATOR OUTPUT AND BE CAPABLE OF BEING LOCKED OPEN, TAGGED AND GROUNDED ON THE COMPANY SIDE BY COMPANY PERSONNEL. THE VISIBLE BREAK REQUIREMENT CAN BE MET BY OPENING THE ENCLOSURE TO OBSERVE THE CONTACT SEPARATION.

DRAWING TITLE
ELECTRICAL NOTES & SYMBOL LIST

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

PUREPOWER ENGINEERING
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WWW.PUREPOWER.COM
RICHARD A. IVINS
CT LICENSE No. 0029262

ENGINEER
STATE OF CONNECTICUT RICHARD A. IVINS PEN.0029262 LICENSED PROFESSIONAL ENGINEER

DEVELOPER
Safari Energy
SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK 10018
WWW.SAFARIENERGY.COM

PAGE SIZE 36" x 24"
PROJECT # PPE 18.087

DC SYSTEM SIZE:	2729.60 kW
AC SYSTEM SIZE:	2032.80 kW
MODULE:	LG400N2W-A5
MODULE QUANTITY:	6824
STRING QUANTITY:	329
ORIENTATION:	VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

DRAWING #
E001

RULER IN INCHES:

PLOT DATE: 10/22/2018 2:13 PM

SYSTEM C:
SOUTH CARPORT
SEE PLAN E102
ELECTRICAL ROOM B
METER # 78002891
DC SYSTEM SIZE: 1366.00kWDC
AC SYSTEM SIZE: 984.00kWAC

SYSTEM B:
NORTH CARPORT
SEE PLAN E102
ELECTRICAL ROOM B
METER # 891051782
DC SYSTEM SIZE: 688.80kWDC
AC SYSTEM SIZE: 516.00kWAC

SYSTEM A: ROOFTOP
SEE PLAN E101
ELECTRICAL ROOM E
METER # 360119221
DC SYSTEM SIZE: 674.40kWDC
AC SYSTEM SIZE: 532.80kWAC

AC DUCTBANK FROM SOLAR AC SWITCHBOARDS TO SOLAR GENERATOR DISCONNECT SWITCHES

ELECTRICAL ROOM B

SOLAR GENERATOR DISCONNECT SWITCH B (AT GROUND LEVEL)

SOLAR GENERATOR DISCONNECT SWITCH C (AT GROUND LEVEL)

ELECTRICAL ROOM E

SOLAR GENERATOR DISCONNECT SWITCH A (AT GROUND LEVEL)

SOLAR AC PANELBOARD A WALL MOUNTED AT GROUND LEVEL

INVERTERS C1–C20

SOLAR AC SWITCHBOARD C MOUNTED ON PAD

INVERTERS B1–B11

SOLAR AC SWITCHBOARD B MOUNTED ON PAD

INVERTERS A1–A8

SOLAR AC SUBPANEL A1

INVERTERS A9–A16

SOLAR AC SUBPANEL A2

1 E100 OVERALL ELECTRICAL PLAN
SCALE: 1" = 70'-0"

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

DATE	REVISION DESCRIPTION	PM	ENG CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC RI
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PUREPOWER
NEW YORK | NEW JERSEY
5 MARINE VIEW PLAZA, HOBOKEN, NJ
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RICHARD A. WINDS
CT LICENSE No. 0623462

ENGINEER'S CERTIFICATION
STATE OF CONNECTICUT
RICHARD A. WINDS
LICENSED PROFESSIONAL ENGINEER

DEVELOPER
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1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK, 10018
WWW.SAFARIENERGY.COM
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PAGE SIZE 36" x 24"
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MODULE: LG400N2W-A5
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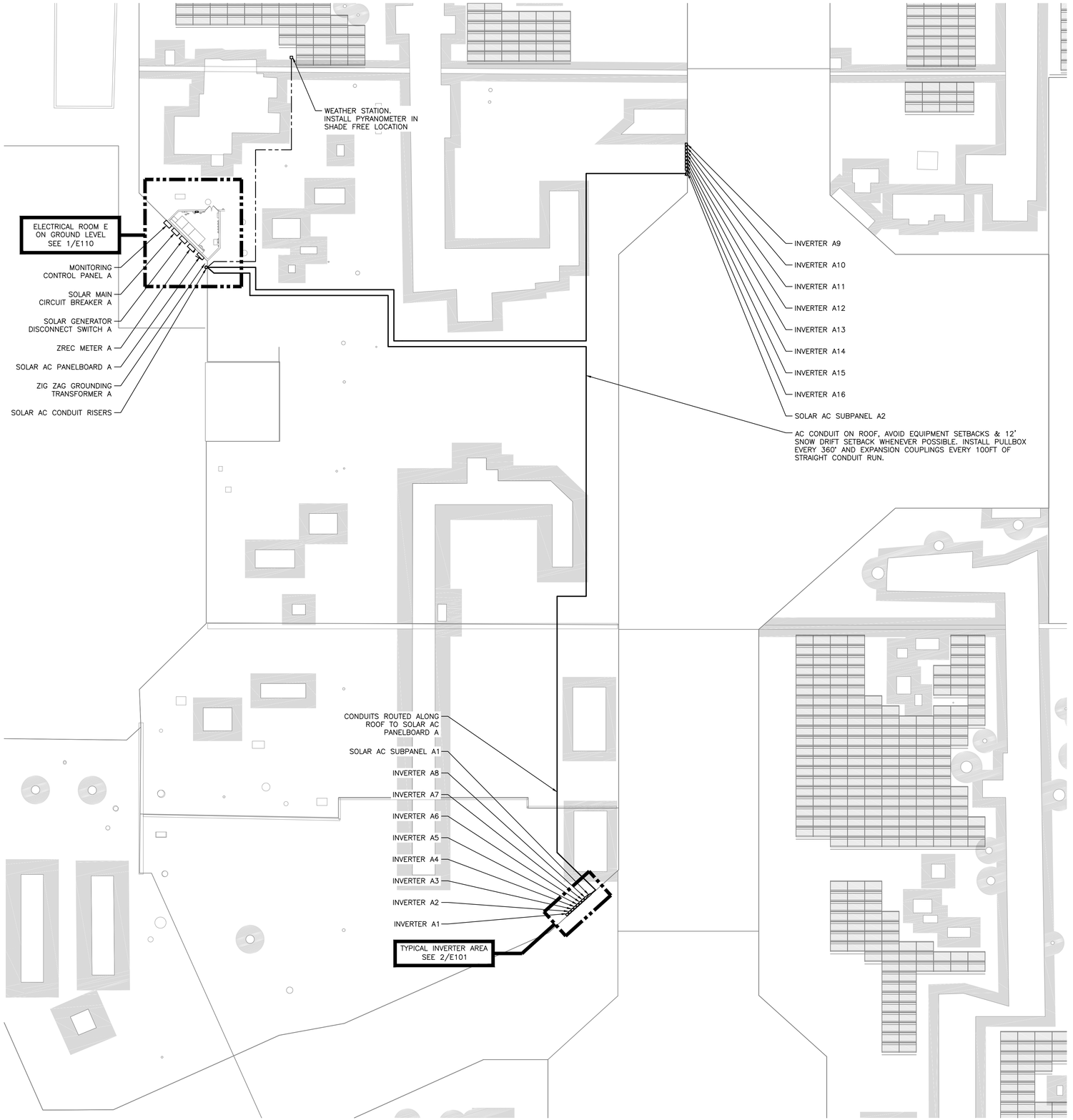
ORIENTATION: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

DRAWING TITLE
OVERALL ELECTRICAL PLAN

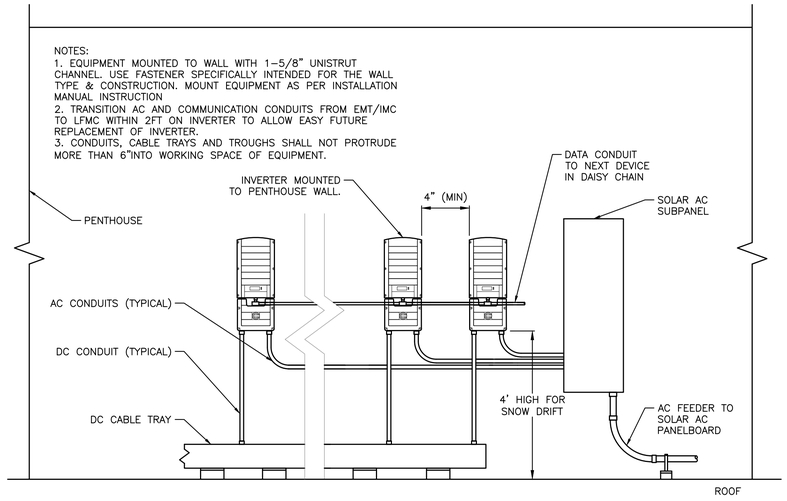
9 OF 32
DRAWING # E100

PLOT DATE: 10/22/2018 2:13 PM



1 E101 ELECTRICAL PLAN – ROOF SYSTEM A
SCALE: 1" = 20'-0"

NOTES:
1. EQUIPMENT MOUNTED TO WALL WITH 1-5/8" UNISTRUT CHANNEL. USE FASTENER SPECIFICALLY INTENDED FOR THE WALL TYPE & CONSTRUCTION. MOUNT EQUIPMENT AS PER INSTALLATION MANUAL INSTRUCTION
2. TRANSITION AC AND COMMUNICATION CONDUITS FROM EMT/IMC TO LFMC WITHIN 2FT ON INVERTER TO ALLOW EASY FUTURE REPLACEMENT OF INVERTER.
3. CONDUITS, CABLE TRAYS AND TROUGHS SHALL NOT PROTRUDE MORE THAN 6"INTO WORKING SPACE OF EQUIPMENT.



MAINTAIN 48" WORKING CLEARANCE
IN FRONT OF ALL EQUIPMENT

2 E101 INVERTER AREA ELEVATION
SCALE: 1/2" = 1'-0"

3 E101 ELECTRICAL ROOM E PLAN
SCALE: 1/4" = 1'-0"

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

PUREPOWER ENGINEERING
5 MARINE VIEW PLAZA, HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. NINO
CT LICENSE No. 0093862

SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK, 10018
WWW.SAFARIENERGY.COM

DEVELOPER: Safari Energy

PAGE SIZE: 36" x 24"
PROJECT #: PPE 18.087

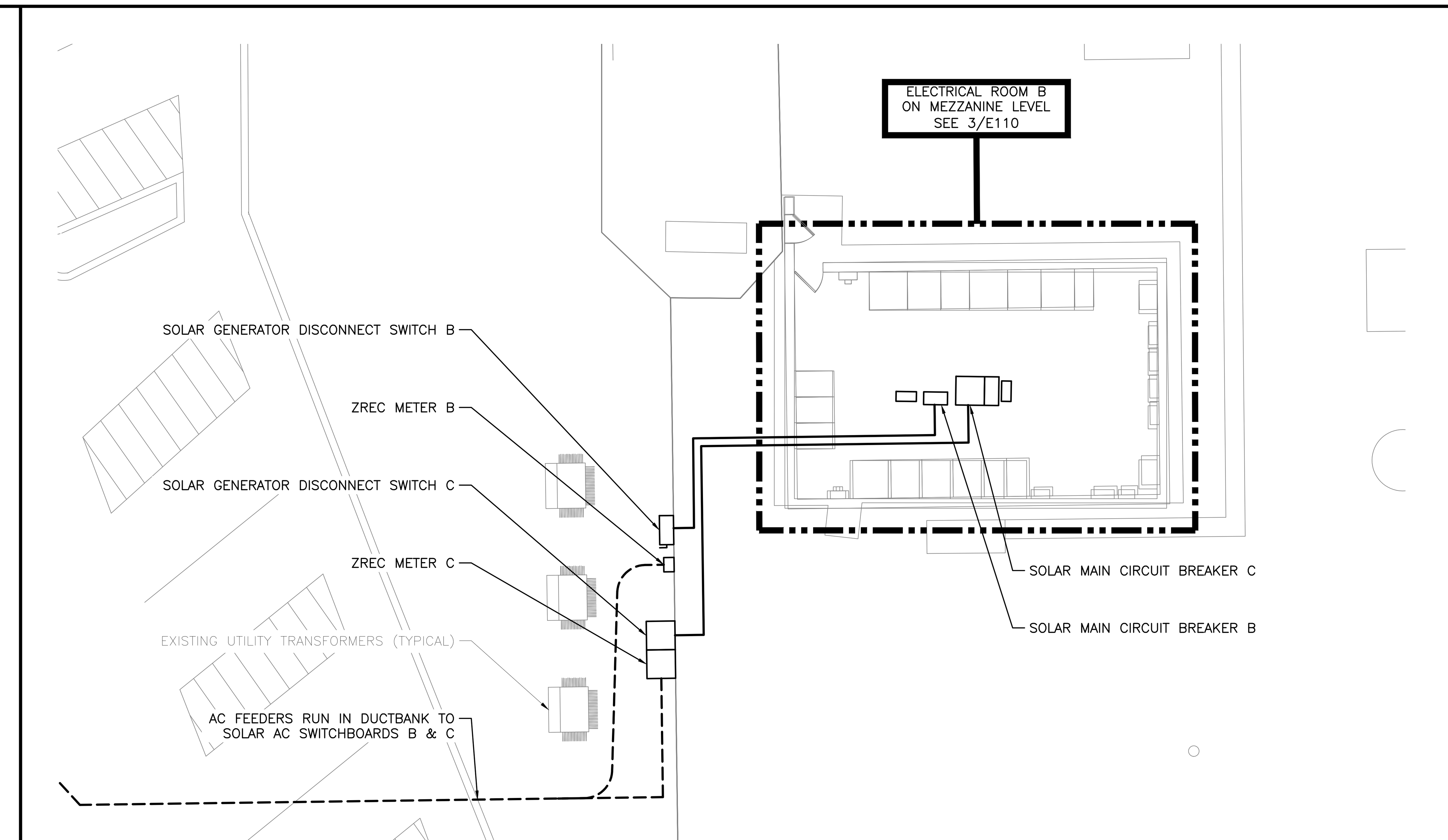
DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 324
ORIENTATION: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

DRAWING TITLE
ELECTRICAL PLAN
ROOF SYSTEM A

10 OF 32
DRAWING # E101

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18



2 E102 ELECTRICAL AREA PLAN – CARPORT SYSTEMS B & C
SCALE: 1" = 10'-0"

1 E102 ELECTRICAL PLAN – CARPORT SYSTEMS B & C
SCALE: 1" = 30'-0"

RULER IN INCHES:

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

PUREPOWER ENGINEERING
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RICHARD A. IVINS
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DEVELOPER

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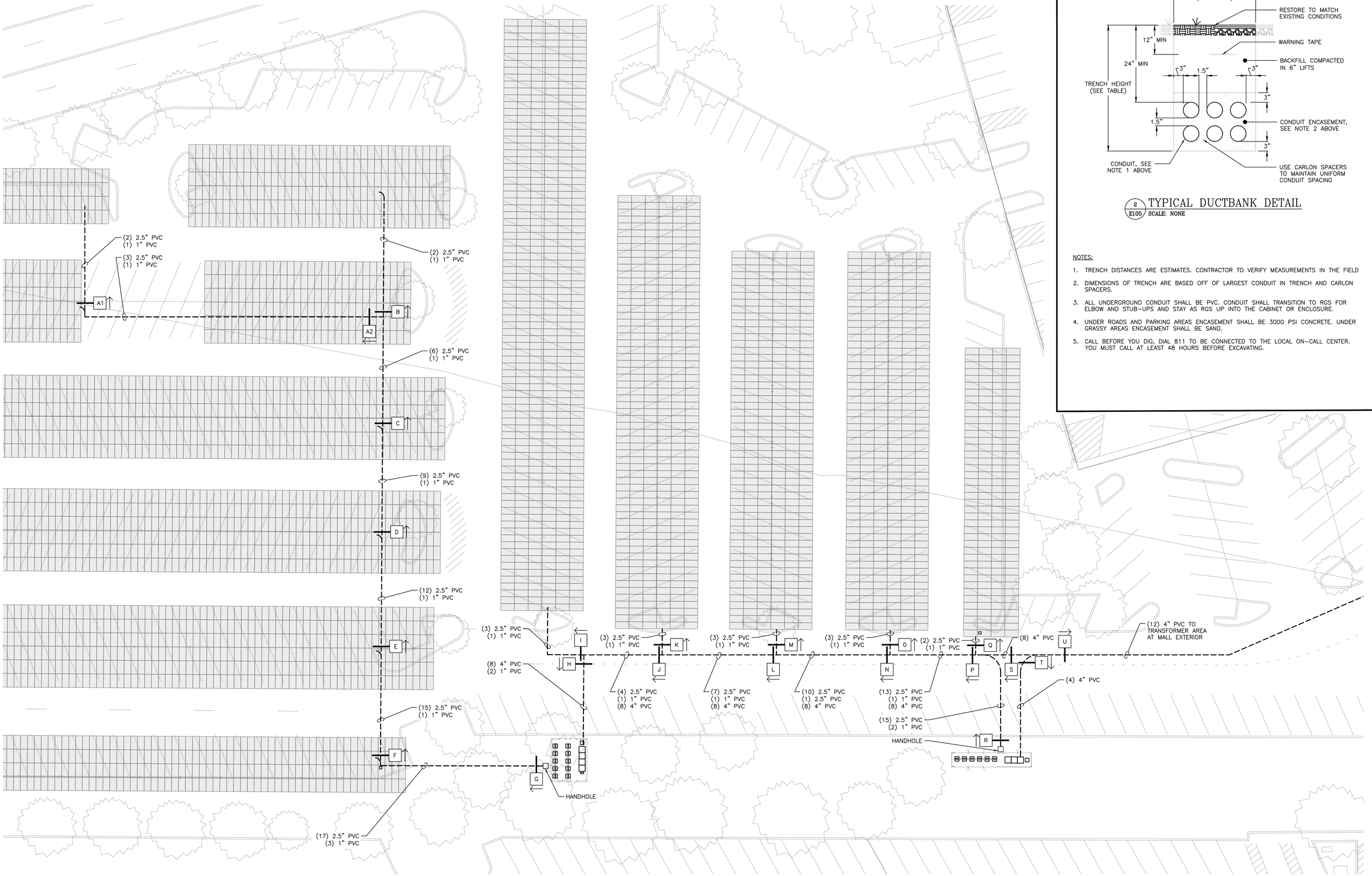
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK 10018
WWW.SAFARIENERGY.COM

PAGE SIZE 36" x 24"
PROJECT # PPE 18.087

DC SYSTEM SIZE:	2729.60 kW
AC SYSTEM SIZE:	2032.80 kW
MODULE:	LG400N2W-A5
MODULE QUANTITY:	6824
STRING QUANTITY:	329
ORIENTATION:	VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

DRAWING TITLE
ELECTRICAL PLAN
CARPORT SYSTEMS B & C



1 E105 CONDUIT ROUTING PLAN
SCALE: 1" = 20'-0"

2 E105 TYPICAL DUCTBANK DETAIL
SCALE: NONE

NOTES:

1. TRENCH DISTANCES ARE ESTIMATES. CONTRACTOR TO VERIFY MEASUREMENTS IN THE FIELD
2. DIMENSIONS OF TRENCH ARE BASED OFF OF LARGEST CONDUIT IN TRENCH AND CARLON SPACERS.
3. ALL UNDERGROUND CONDUIT SHALL BE PVC. CONDUIT SHALL TRANSITION TO RGS FOR ELBOW AND STUB-UPS AND STAY AS RGS UP INTO THE CABINET OR ENCLOSURE.
4. UNDER ROADS AND PARKING AREAS ENCASEMENT SHALL BE 3000 PSI CONCRETE. UNDER GRASSY AREAS ENCASEMENT SHALL BE SAND.
5. CALL BEFORE YOU DIG, DIAL 811 TO BE CONNECTED TO THE LOCAL ON-CALL CENTER. YOU MUST CALL AT LEAST 48 HOURS BEFORE EXCAVATING.

KEY

(2) 2" PVC
- CONDUIT TYPE
- CONDUIT DIAMETER
- CONDUIT QUANTITY

A
- SECTION DIRECTION
- SECTION NAME
- TRENCH SECTION LABEL

DRAWING TITLE: CONDUIT ROUTING PLAN

DATE	REVISION DESCRIPTION	PM	ENG CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC RI

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5 MARINE VIEW PLAZA, HOBOKEN, NJ
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RICHARD A. NINO
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NEW YORK, NEW YORK 10018
WWW.SAFARIENERGY.COM

DEVELOPER: Safari Energy

PAGE SIZE: 36" x 24"
PROJECT #: PPE 18.087

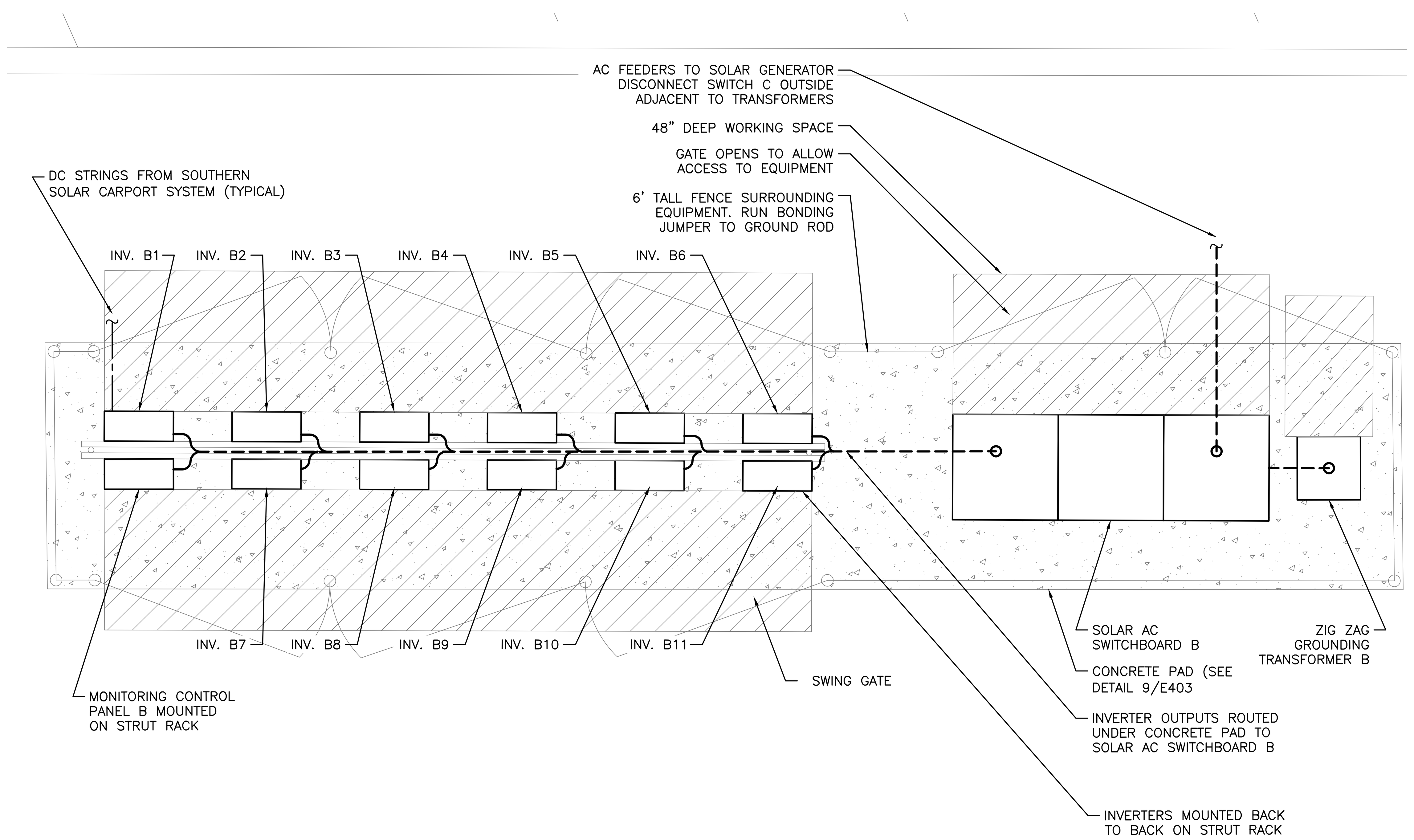
DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 324
ORIENTATION: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

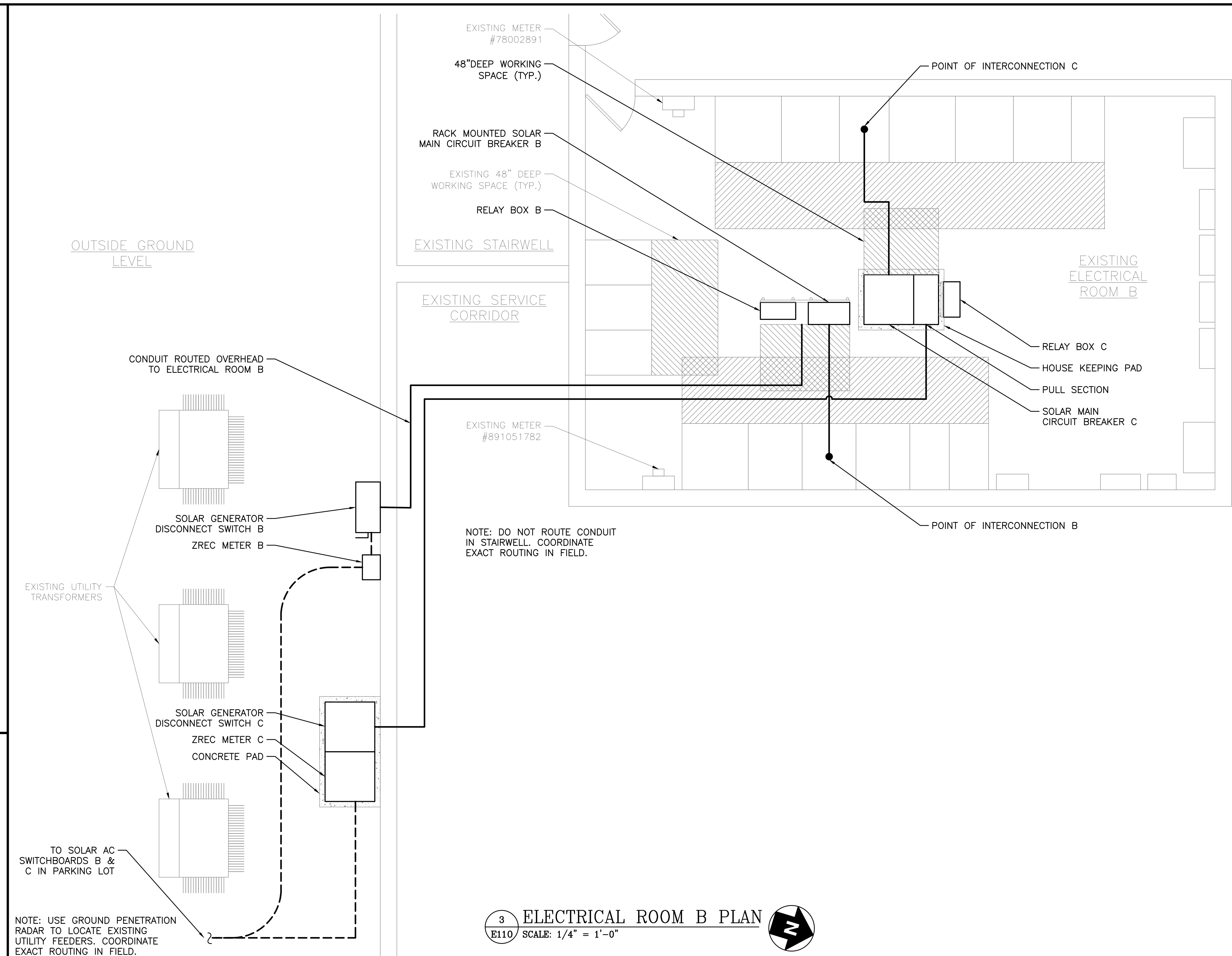
12 OF 32
DRAWING # E105

PLOT DATE: 10/22/2018 2:13 PM

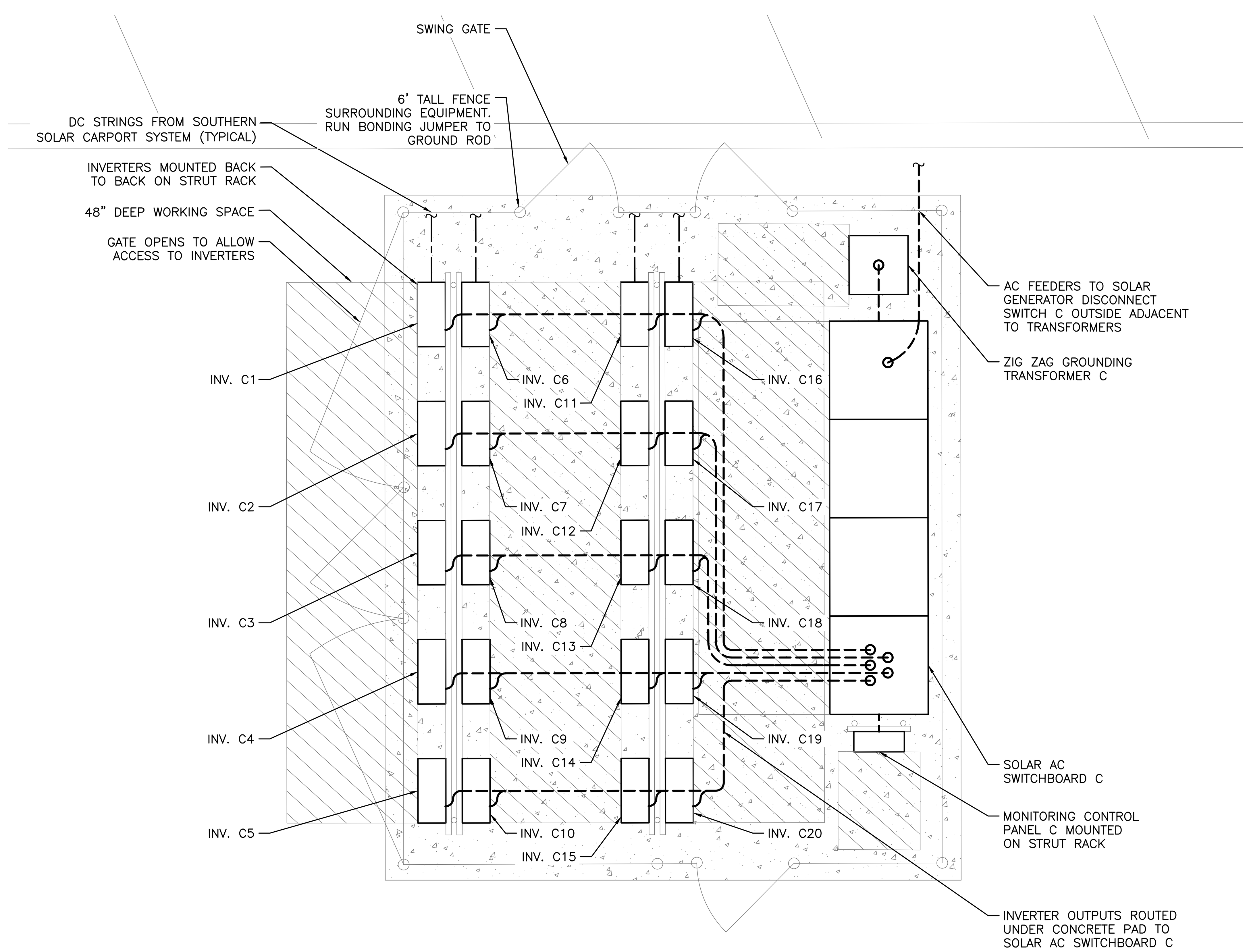
RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18



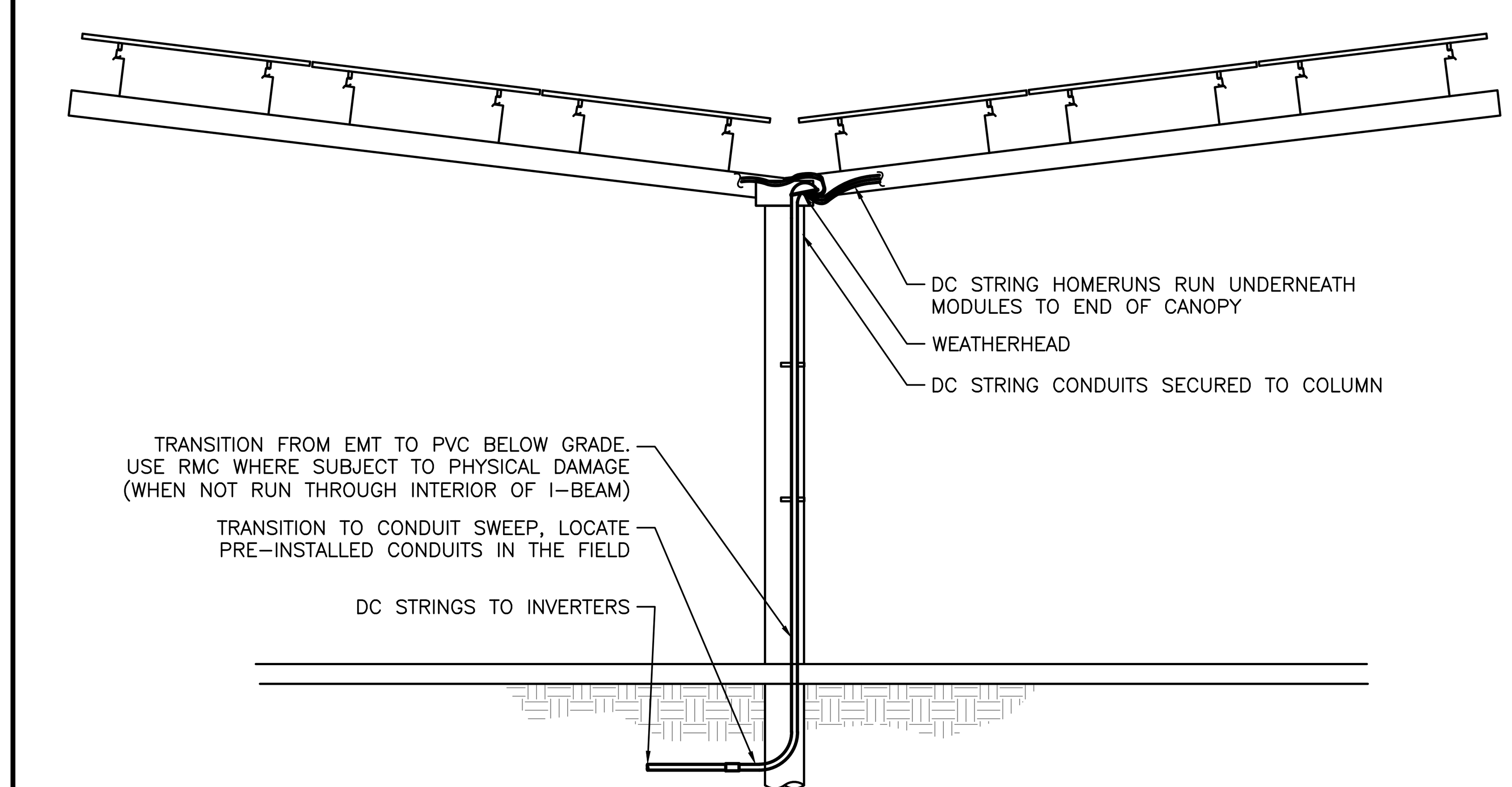
1 SYSTEM B INVERTER AREA PLAN
E110 SCALE: 1/2" = 1'-0"



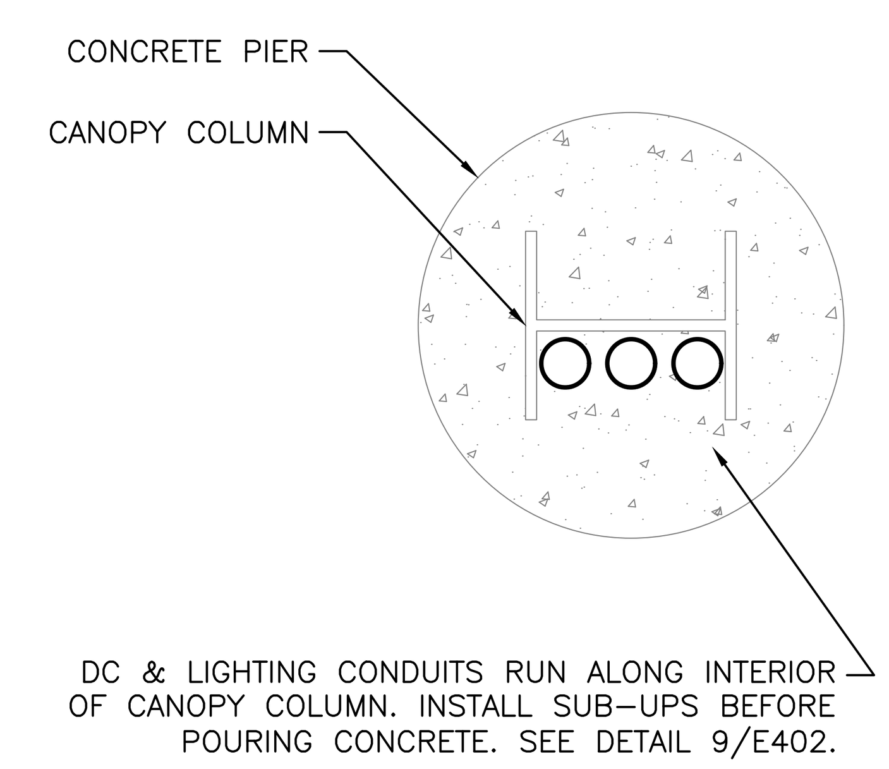
3 ELECTRICAL ROOM B PLAN
E110 SCALE: 1/4" = 1'-0"



2 SYSTEM C INVERTER AREA PLAN
E110 SCALE: 1/2" = 1'-0"



4 DC CONDUIT ROUTING ELEVATION
E110 SCALE: 1/4" = 1'-0"



5 DC CONDUIT ROUTING DETAIL
E110 SCALE: NONE

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

PUREPOWER ENGINEERING
5 MARINE VIEW PLAZA HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. IVINS
CT LICENSE No. 0029262

DEVELOPER
Safari Energy
SAFARI ENERGY, LLC
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK 10018
WWW.SAFARIENERGY.COM

PAGE SIZE 36" x 24"
PROJECT # PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 329
ORIENTATION: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

DRAWING TITLE
ELECTRICAL ROOM PLANS

13 OF 32
DRAWING #
E110

PLOT DATE: 10/22/2018 2:13 PM
RULER IN INCHES:

PLOT DATE: 10/22/2018 2:13 PM

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
CALCULATIONS	+	6.1 fc	9.4 fc	2.3 fc	4.1:1	2.7:1
Stat Zone # 1	⋇	6.0 fc	7.6 fc	4.5 fc	1.7:1	1.3:1

NOTE:
1. READINGS SHOWN ARE BASED ON A TOTAL LLF AS SHOWN AT GRADE. DATA REFERENCES THE EXTRAPOLATED PERFORMAN CE PROJECTIONS IN A 25°C AMBIENT BASED PM 10,000 HRRS OF LED TESTING (PER IESNA TM-21-11)
2. PLEASE REFER TO THE "LUMINAIRE LOCATIONS" TABLE FOR MOUNTING HEIGHTS
3. PRODUCT INFORMATION CAN BE OBTAINED AT WWW.HOLOPHANE.COM OR THROUGH YOUR LOCAL AGENCY.
4. REFLECTANCES: 50/0/20.
5. EXISTING POLE AND FIXTURE TO BE REMOVED AND DISPOSED BY CONTRACTOR. LED LAMPS SHALL BE TURNED OVER TO TAUBMAN FOR REUSE.
6. CONNECT NEW FIXTURES TO EXISTING 480V LIGHT CIRCUITS WITH LIGHTING CONTROL SYSTEM THROUGH 3#8 & 1#8G BRANCH CIRCUITS.

Schedule

Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Filename	Lumens Per Lamp	Light Loss Factor	Wattage
◪	A	98	Holophane	PPSQL2 P60 40K/50K XX PY T5W	Holophane ParkPak Square LED, LED Performance Package P60, 66W, 4000K/5000K CCT, Voltage, Polycarbonate Lens, Type V, Wide	LED	1	PPSQL2_P60_40K_50K_XX_PY_T5W.ies	6376	0.9	66
⊠	B	88	Holophane	PPSQL2 P80 40K/50K XX PY T5W	Holophane ParkPak Square LED, LED Performance Package P80, 96W, 4000K/5000K CCT, Voltage, Polycarbonate Lens, Type V, Wide	LED	1	PPSQL2_P80_40K_50K_XX_PY_T5W.ies	8507	0.9	96

1 E150 LIGHTING PLAN
SCALE: NONE

RULER IN INCHES:

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

ENGINEER
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RICHARD A. IVINS
CT LICENSE No. 0029262

STATE OF CONNECTICUT RICHARD A. IVINS PEN.0029262 LICENSED PROFESSIONAL ENGINEER

DEVELOPER
Safari Energy
SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK 10018
WWW.SAFARIENERGY.COM

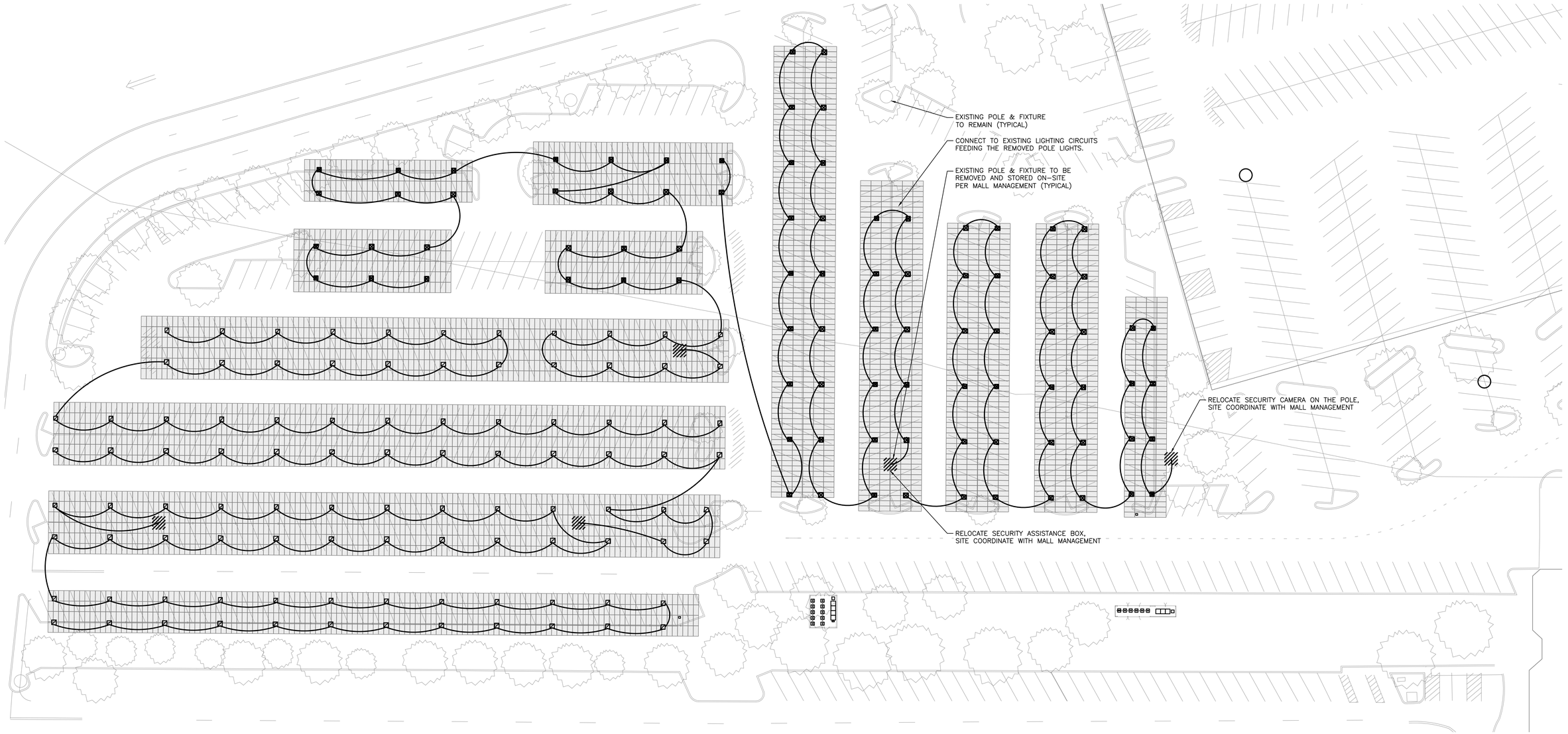
PAGE SIZE 36" x 24"
PROJECT # PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 329
ORIENTATION: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

DRAWING TITLE
LIGHTING PLAN

DRAWING #
E150



1 E151 LIGHTING CIRCUIT PLAN
SCALE: 1" = 30'-0"

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BK	CC	RI

PUREPOWER
ENGINEERING
5 MARINE VIEW PLAZA HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. NINO
CT LICENSE No. 0023462

SHEET CONNECTION ENGINEER'S SEAL RICHARD A. NINO REGISTERED PROFESSIONAL ENGINEER

DEVELOPER
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NEW YORK, NEW YORK 10018
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Safari Energy

PAGE SIZE 36" x 24"
PROJECT # PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 328
ORIENTATION: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

DRAWING TITLE
LIGHTING CIRCUIT PLAN

15 OF 32
DRAWING # E151

PLOT DATE: 10/22/2018 2:13 PM

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

PLOT DATE: 10/22/2018 2:13 PM

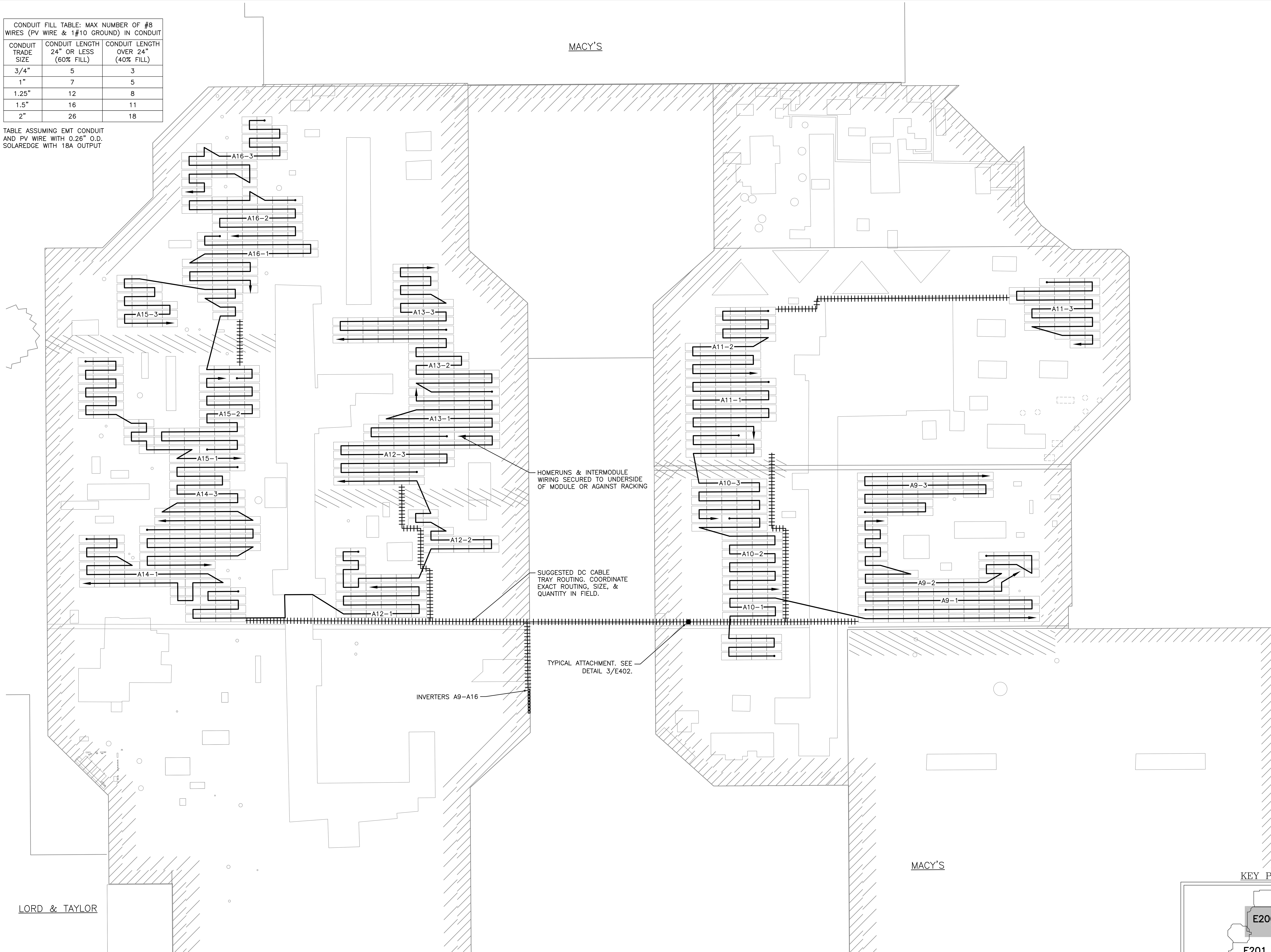
CABLE TRAY FILL TABLE: MAX NUMBER OF #10 WIRES (PV WIRE OR GROUND) IN CABLE TRAY (LADDER OR WIRE MESH STYLE)	
CABLE TRAY WIDTH	SINGLE CONDUCTORS
2"	33
4"	76
6"	110
8"	144

CONDUIT FILL TABLE: MAX NUMBER OF #8 WIRES (PV WIRE & 1#10 GROUND) IN CONDUIT		
CONDUIT TRADE SIZE	CONDUIT LENGTH 24" OR LESS (60% FILL)	CONDUIT LENGTH OVER 24" (40% FILL)
3/4"	5	3
1"	7	5
1.25"	12	8
1.5"	16	11
2"	26	18

TABLE ASSUMING EMT CONDUIT AND PV WIRE WITH 0.26" O.D. SOLAREDGE WITH 18A OUTPUT

STRING SUMMARY

String #	Module Quantity	Optimizer Quantity
A9-1	36	18
A9-2	36	18
A9-3	36	18
A10-1	36	18
A10-2	36	18
A10-3	36	18
A11-1	36	18
A11-2	36	18
A11-3	36	18
A12-1	36	18
A12-2	36	18
A12-3	36	18
A13-1	36	18
A13-2	36	18
A13-3	36	18
A14-1	36	18
A14-2	36	18
A14-3	36	18
A15-1	36	18
A15-2	36	18
A15-3	36	18
A16-1	34	17
A16-2	34	17
A16-3	34	17

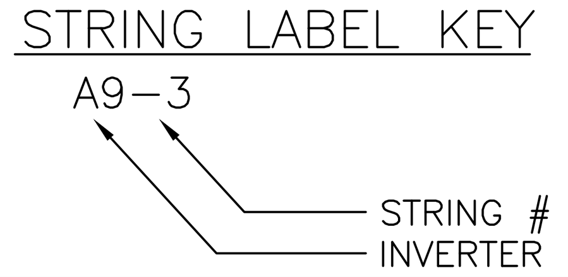


IMPORTANT
CONTRACTOR MUST:
1. REDLINE DRAWINGS TO REFLECT EXACT AS-BUILT STRINGING AND RETURN TO PURE POWER.
2. CREATE MAP OF SOLAREDGE POWER OPTIMIZER ADDRESSING AND RETURN TO SOLAREDGE.

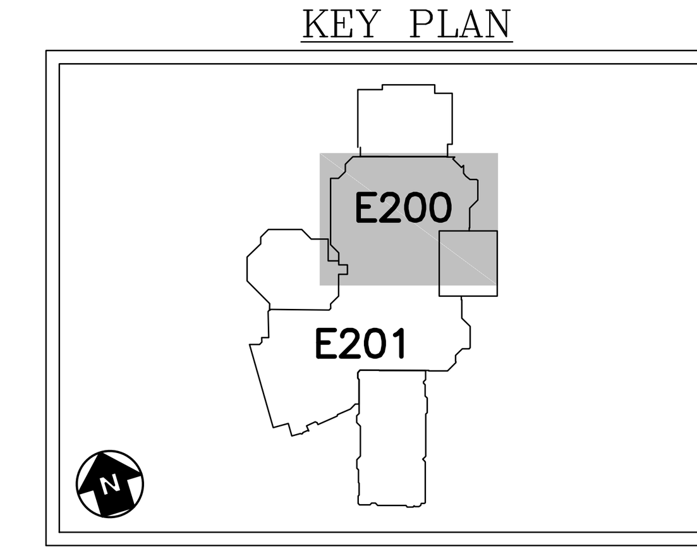
RAPID SHUTDOWN NOTE:
SOLAREDGE INVERTERS SHUTDOWN VOLTAGE TO THE MODULE LEVEL WHEN AC POWER GOES OUT, IN COMPLIANCE WITH NEC2014 690.12 RAPID SHUTDOWN

1 E200 DC ELECTRICAL PLAN SYSTEM A - NORTH ROOF
SCALE: 1" = 20'-0"

STRING LABEL KEY



KEY PLAN



DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

ENGINEER
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CT LICENSE No. 0029262

DEVELOPER
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WWW.SAFARIENERGY.COM

PAGE SIZE 36" x 24"
PROJECT # PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 329
ORIENTATION: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

DRAWING TITLE
DC ELECTRICAL PLAN
SYSTEM A NORTH ROOF

DRAWING #
E200

RULER IN INCHES:

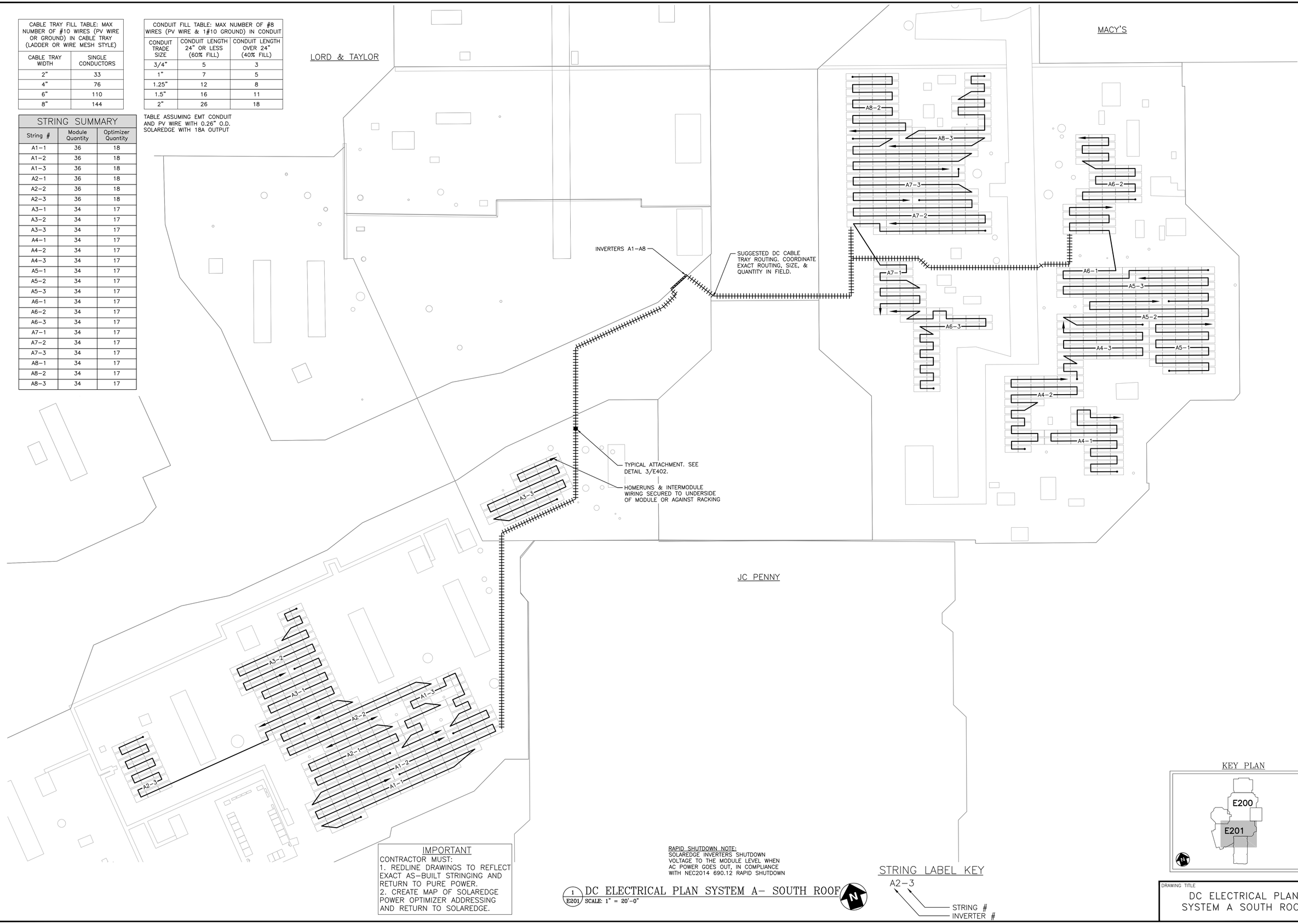
PLOT DATE: 10/22/2018 2:13 PM

CABLE TRAY FILL TABLE: MAX NUMBER OF #10 WIRES (PV WIRE OR GROUND) IN CABLE TRAY (LADDER OR WIRE MESH STYLE)	
CABLE TRAY WIDTH	SINGLE CONDUCTORS
2"	33
4"	76
6"	110
8"	144

CONDUIT FILL TABLE: MAX NUMBER OF #8 WIRES (PV WIRE & 1#10 GROUND) IN CONDUIT		
CONDUIT TRADE SIZE	CONDUIT LENGTH 24" OR LESS (60% FILL)	CONDUIT LENGTH OVER 24" (40% FILL)
3/4"	5	3
1"	7	5
1.25"	12	8
1.5"	16	11
2"	26	18

TABLE ASSUMING EMT CONDUIT AND PV WIRE WITH 0.26" O.D. SOLAREDGE WITH 18A OUTPUT

STRING SUMMARY		
String #	Module Quantity	Optimizer Quantity
A1-1	36	18
A1-2	36	18
A1-3	36	18
A2-1	36	18
A2-2	36	18
A2-3	36	18
A3-1	34	17
A3-2	34	17
A3-3	34	17
A4-1	34	17
A4-2	34	17
A4-3	34	17
A5-1	34	17
A5-2	34	17
A5-3	34	17
A6-1	34	17
A6-2	34	17
A6-3	34	17
A7-1	34	17
A7-2	34	17
A7-3	34	17
A8-1	34	17
A8-2	34	17
A8-3	34	17



IMPORTANT
CONTRACTOR MUST:
1. REDLINE DRAWINGS TO REFLECT EXACT AS-BUILT STRINGING AND RETURN TO PURE POWER.
2. CREATE MAP OF SOLAREDGE POWER OPTIMIZER ADDRESSING AND RETURN TO SOLAREDGE.

RAPID SHUTDOWN NOTE:
SOLAREDGE INVERTERS SHUTDOWN VOLTAGE TO THE MODULE LEVEL WHEN AC POWER GOES OUT, IN COMPLIANCE WITH NEC2014 690.12 RAPID SHUTDOWN

1 / E201 DC ELECTRICAL PLAN SYSTEM A- SOUTH ROOF
SCALE: 1" = 20'-0"

STRING LABEL KEY
A2-3
STRING #
INVERTER #

KEY PLAN

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

PUREPOWER ENGINEERING
5 MARINE VIEW PLAZA HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. INNIS
CT LICENSE No. 0093962

SHEET DESIGNED FOR ENVIRONMENTAL CONDITIONS AND CONSTRUCTED TO BE FREE FROM MAJOR DEFECTS. TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF. WORK WAS DONE IN ACCORDANCE WITH NEW JERSEY BUILDING LAWS. RICHARD A. INNIS, PE NEW JERSEY PROFESSIONAL ENGINEER

DEVELOPER

SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK 10018
WWW.SAFARIENERGY.COM

Safari Energy

PAGE SIZE: 36" x 24"
PROJECT #: PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 328
ORIENTATION: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

DRAWING TITLE
DC ELECTRICAL PLAN
SYSTEM A SOUTH ROOF

17 OF 32
DRAWING # E201

CABLE TRAY FILL TABLE: MAX NUMBER OF #10 WIRES (PV WIRE OR GROUND) IN CABLE TRAY (LADDER OR WIRE MESH STYLE)	
CABLE TRAY WIDTH	SINGLE CONDUCTORS
2"	33
4"	76
6"	110
8"	144

CONDUIT FILL TABLE: MAX NUMBER OF #10 WIRES (PV WIRE OR GROUND) IN CONDUIT		
CONDUIT TRADE SIZE	CONDUIT LENGTH 24" OR LESS (60% FILL)	CONDUIT LENGTH OVER 24" (40% FILL)
3/4"	6	4
1"	10	6
1-1/4"	16	11
1-1/2"	22	15
2"	37	20

TABLE ASSUMING EMT CONDUIT AND PV WIRE WITH 0.26" O.D.

STRING SUMMARY	
String #	Module Quantity
B1-1	16
B1-2	16
B1-3	16
B1-4	16
B1-5	16
B1-6	16
B1-7	18
B1-8	18
B1-9	18
B1-10	18
B2-1	17
B2-2	17
B2-3	17
B2-4	17
B2-5	17
B2-6	17
B2-7	17
B2-8	17
B2-9	17
B2-10	17
B2-11	17
B2-12	17
B3-1	18
B3-2	18
B3-3	18
B3-4	18
B3-5	18
B3-6	18
B3-7	18
B4-1	17
B4-2	17
B4-3	17
B4-4	17
B4-5	17
B4-6	17
B4-7	17
B4-8	17
B4-9	17
B4-10	17
B4-11	17
B4-12	17
B5-1	18
B5-2	18
B5-3	18
B5-4	18
B5-5	18
B5-6	18
B5-7	18
B6-1	18
B6-2	18

STRING SUMMARY	
String #	Module Quantity
B6-3	18
B6-4	18
B6-5	18
B6-6	18
B6-7	18
B7-1	18
B7-2	18
B7-3	18
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B8-7	18
B9-1	16
B9-2	16
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B9-5	16
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B9-7	16
B10-1	16
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B10-7	17
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B10-9	17
B10-10	17
B10-11	17
B10-12	17
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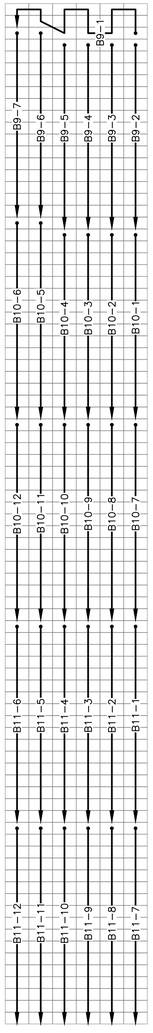
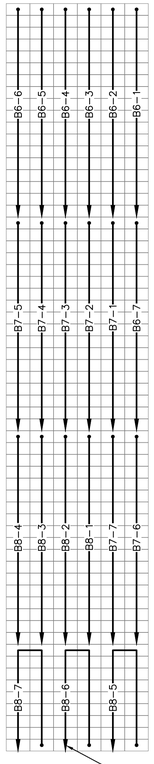
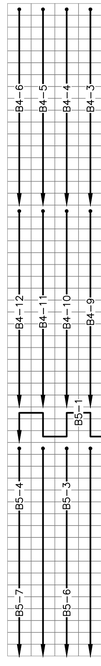
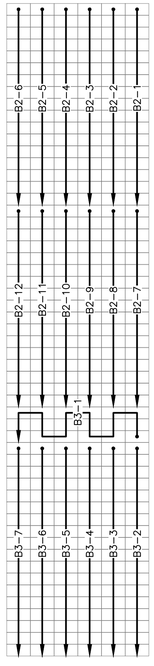
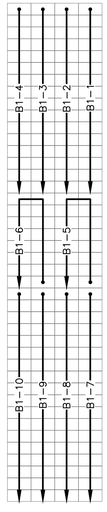
B11-12	17

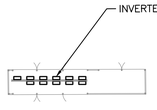


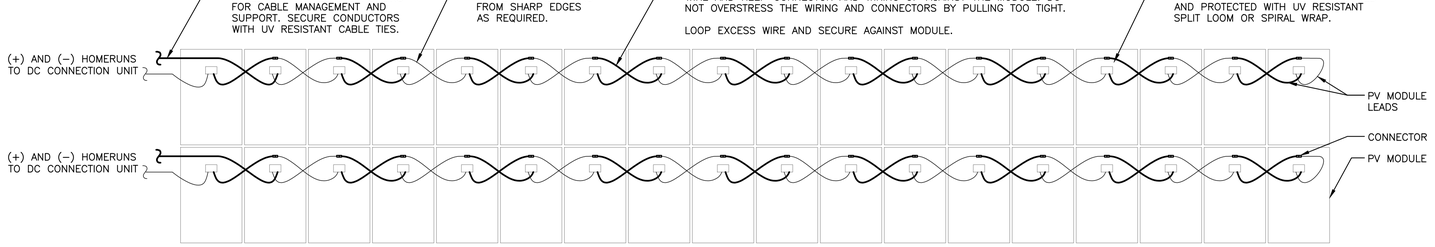






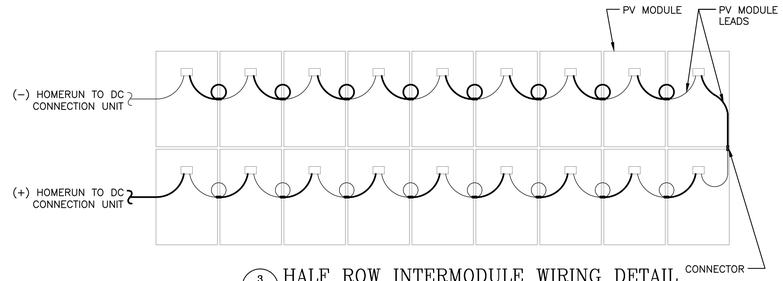






2 E202 FULL ROW INTERMODULE WIRING DETAIL
SCALE: NONE

LOOP EXCESS WIRE AND SECURE AGAINST MODULE.

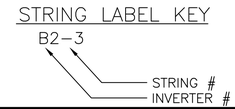


3 E202 HALF ROW INTERMODULE WIRING DETAIL
SCALE: NONE

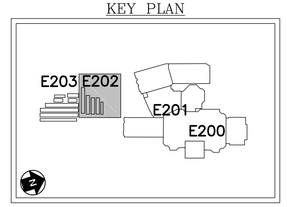
IMPORTANT
CONTRACTOR MUST REDLINE DRAWINGS TO REFLECT EXACT AS-BUILT STRINGING AND RETURN TO PURE POWER.

1 E202 DC ELECTRICAL PLAN SYSTEM B - NORTH CARPORT
SCALE: 1" = 20'-0"

STRING LABEL KEY



KEY PLAN



REVISION	DESCRIPTION	DATE	PM	ENG	CHK
	CONSTRUCTION DOCUMENTS	10/15/2018	BX	CC	RI
	DESIGN DEVELOPMENT	08/21/2018	BX	CC	RI

PUREPOWER ENGINEERING
5 MARINE VIEW PLAZA HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. NINO
CT LICENSE No. 0093462

DEVELOPER: Safari Energy

PAGE SIZE: 36" x 24"
PROJECT #: PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 424
OPERATIONS: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK, 10018
WWW.SAFARIENERGY.COM

DRAWING TITLE
DC ELECTRICAL PLAN
SYSTEM B NORTH CARPORT

18 OF 32

DRAWING #
E202

PLOT DATE: 10/22/2018 2:13 PM

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

PLOT DATE: 10/22/2018 2:13 PM

STRING SUMMARY	
String #	Module Quantity
C1–1	16
C1–2	16
C1–3	16
C1–4	16
C1–5	16
C1–6	16
C1–7	16
C2–1	16
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C7–10	16

STRING SUMMARY	
String #	Module Quantity
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C13–14	16

STRING SUMMARY	
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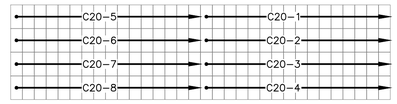
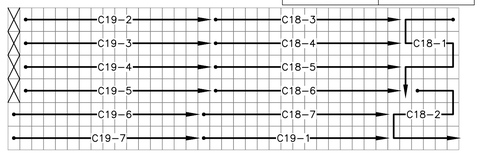
C20–1	16
C20–2	16
C20–3	16
C20–4	16
C20–5	16
C20–6	16
C20–7	16
C20–8	16

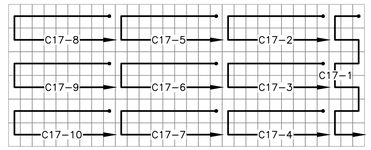
CABLE TRAY FILL TABLE: MAX NUMBER OF #10 WIRES (PV WIRE OR GROUND) IN CABLE TRAY (LADDER OR WIRE MESH STYLE)	
CABLE TRAY WIDTH	SINGLE CONDUCTORS
2"	33
4"	76
6"	110
8"	144

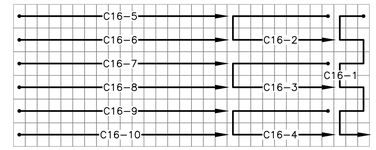
CONDUIT FILL TABLE: MAX NUMBER OF #10 WIRES (PV WIRE OR GROUND) IN CONDUIT		
CONDUIT TRADE SIZE	CONDUIT LENGTH 24" OR LESS (60% FILL)	CONDUIT LENGTH OVER 24" (40% FILL)
3/4"	6	4
1"	10	6
1–1/4"	16	11
1–1/2"	22	15
2"	37	20

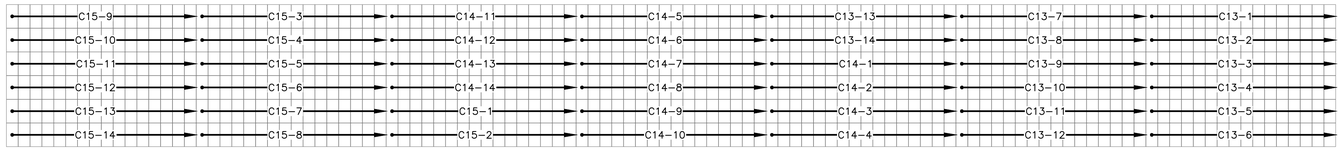
TABLE ASSUMING EMT CONDUIT AND PV WIRE WITH 0.26" O.D.

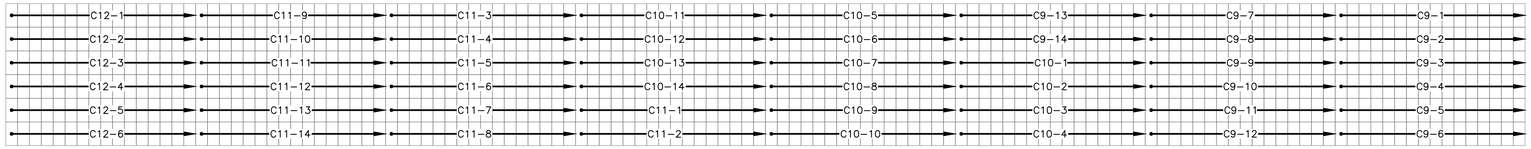


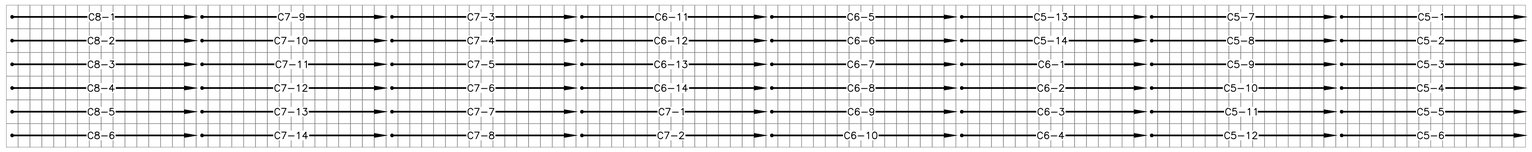


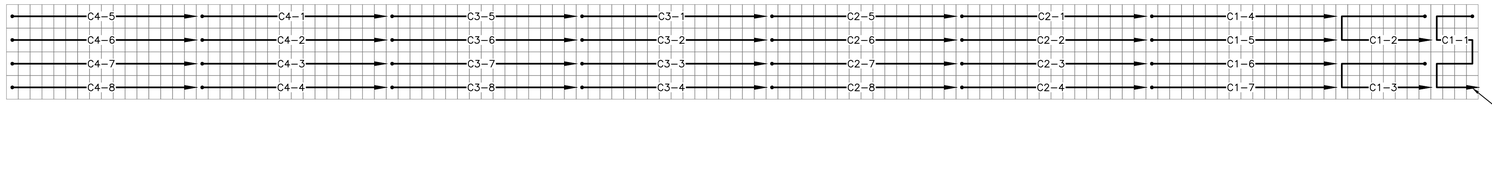


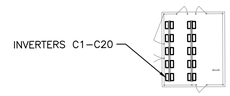




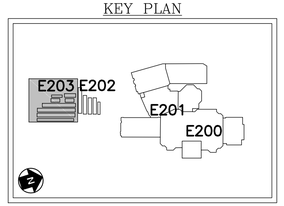








KEY PLAN

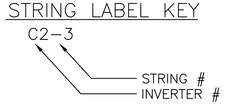


NOTE: SEE E203 FOR CARPORT STRING WIRING DETAILS

IMPORTANT
CONTRACTOR MUST REDLINE DRAWINGS TO REFLECT EXACT AS–BUILT STRINGING AND RETURN TO PURE POWER.

1 / E203 DC ELECTRICAL PLAN SYSTEM C – SOUTH CARPORT
SCALE: 1" = 20'–0"

STRING LABEL KEY



RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

PUREPOWER
ENGINEERING
5 MARINE VIEW PLAZA HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. WINS
CT LICENSE No. 0023462

DEVELOPER
Safari Energy
SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK 10018
WWW.SAFARIENERGY.COM

PAGE SIZE: 36" x 24"
PROJECT #: PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W–A5
MODULE QUANTITY: 6824
STRING QUANTITY: 428
ORIENTATION: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

DRAWING TITLE
DC ELECTRICAL PLAN
SYSTEM C SOUTH CARPORT

19 OF 32
DRAWING # E203

PLOT DATE: 10/22/2018 2:13 PM

EXISTING UTILITY SERVICE

EXISTING UTILITY TRANSFORMER #0-1X
KVA: 2000
PRI: 23KV
SEC: 480Y/277V, 3ø, 4W

EXTERIOR AREA
ELECTRICAL ROOM E

3000A 3P GFPE

M — CT CABINET & UTILITY METER 36019221

EXISTING MAIN SWITCHBOARD 'E-BLDG MAIN'
480Y/277V, 3ø, 4W
3000A BUS

#12 SIS CABLE

SEL-3031 RADIO

UPS 277VAC TO 48VDC

RELAY BOX A
MOUNTED IN NEMA 1 ENCLOSURE

51

USE DC POWER SUPPLY IN RELAY ENCLOSURE

TAP BUS ON LOAD-SIDE OF EXISTING UTILITY METER, METHOD TO BE APPROVED BY MANUFACTURER OR APPROVED AGENCY

TO EXISTING BUILDING DISTRIBUTION PANEL

3 SETS:
4#400MCM & 1#400MCMG
CU-THWN2 - 3.5"EMT
25' MAX PER TAP RULE

4#12 SIS & 1#12G CU - 1" CONDUIT

6#12 SIS & 1#12G CU - 1" CONDUIT

SEAL INTERIOR OF CONDUIT TO PREVENT MOISTURE FROM ENTERING BUILDING. POLYWATER FST OR EQUAL.

ELECTRICAL ROOM E
EXTERIOR AREA

SOLAR MAIN CIRCUIT BREAKER A
ISOLATED NEUTRAL KIT
480V, 65KAIC
NEMA 4, LOCKABLE IN OFF POSITION

3PT'S
480:120

3CT'S
800:5

ST — 800A 3P GFPE

SHUNT TRIP COIL IN SOLAR MAIN CIRCUIT BREAKER A

3 SETS:
4#400MCM & 1#3/0G
AL-XHHW2 - 3"EMT

SOLAR GENERATOR DISCONNECT SWITCH A
UNFUSED DISCONNECT SWITCH,
ISOLATED NEUTRAL KIT
600V, 800A/3P, 60SCCR
NEMA 4, LOCKABLE IN OFF POSITION
* EQUIPMENT MAY REQUIRE FUSES TO MEET REQUIRED SCCR RATING

3 SETS:
4#400MCM & 1#3/0G
AL-XHHW2 - 3"EMT

ZREC METER A
ISOLATED NEUTRAL KIT
9S METER SOCKET
ENCLOSURE PROVIDED BY THE CONTRACTOR
NEMA 4

800:5 — M

3 SETS:
4#400MCM & 1#3/0G
AL-XHHW2 - 3"EMT

SOLAR AC PANELBOARD A
480Y/277V, 3ø, 4W,
800A MLO, 65KAIC
NEMA 4

3CTs
800:5

AUX CONTACT — 60A 3P

400A 3P

15A 1P — 2#12 & 1#12G CU 3/4"EMT
TO MONITORING CP POWER SUPPLY (NEGLIGIBLE LOAD)

400A 3P

15A 3P — 6#12 & 1#12G CU THWN-1"EMT

REVENUE GRADE METER VOLTAGE REFERENCE (NO LOAD)

M — REVENUE GRADE METER

4#2 & 1#8G CU 1.5"EMT

ZIGZAG GROUNDING TRANSFORMER A
38KVA
480Y/277V, 3ø, 4W, NEMA 3R
2290A @ 5sec WITHSTAND
45.65A PER PHASE @ 110% OV
AND 4% VOLTAGE UNBALANCE
Xo = 259mohm
Ro = 65mohm
Z = 268mohm
Z% = 4.4%

2 SETS:
4#250MCM & 1#1/0G
AL-XHHW2 - 2.5"EMT

2 SETS:
4#250MCM & 1#1/0G
AL-XHHW2 - 2.5"EMT

EXTERIOR AREA — EXTERIOR AREA
ROOF — ROOF

SPD

SOLAR AC SUBPANEL A1
480Y/277V, 3ø, 4W,
400A MLO, 15KAIC
NEMA 4

60A 3P — INVERTER 2
60A 3P — INVERTER 3
60A 3P — INVERTER 4
60A 3P — INVERTER 5
60A 3P — INVERTER 6
60A 3P — INVERTER 7
60A 3P — INVERTER 8

SPD

SOLAR AC SUBPANEL A2
480Y/277V, 3ø, 4W,
400A MLO, 15KAIC
NEMA 4

60A 3P — INVERTER 9
60A 3P — INVERTER 10
60A 3P — INVERTER 11
60A 3P — INVERTER 12
60A 3P — INVERTER 13
60A 3P — INVERTER 14
60A 3P — INVERTER 15
60A 3P — INVERTER 16

TYPICAL 33.3KW INVERTER
UNLESS NOTED OTHERWISE

TORQUE AC & DC TERMINALS PER INSTALL MANUAL, APPLY TORQUE MARKS.

4#6 & 1#10G CU-THWN2 - 1"EMT

INSTALL WITH 3" DIAMETER LOOP TO FACILITATE FUTURE REPLACEMENT

INVERTER A1
33.3KW AC OUTPUT
SOLAREDGE SE33.3KUS
1000VDC, FUNCTIONAL GROUNDED
DC GFCI & AFCI

INTEGRAL COMBINER BOX & DC SWITCH

DC SPRING CLAMP TERMINALS

INSTALL WITH A 3" DIAMETER LOOP TO FACILITATE CLAMP METER ACCESS.

1-1 1-2 1-3

#8 CU PV WIRE
1000V 90°C
+ RED, - BLACK
(TYPICAL)

(2) PV MODULES WIRED PER OPTIMIZER
(17) OR (18) OPTIMIZERS WIRED IN SERIES
(34) OR (36) MODULES PER STRING CIRCUIT
SEE E200 SERIES FOR DETAILS

NEGATIVE RUN ALONG WITH THE POSITIVE WIRE, SECURED TO UNDERSIDE OF THE RACKING & MODULES USING ZIP TIES OUTDOOR RATED FOR UV, HELLERMANN-TYTON PA66UV OR EQUAL. TRANSITION TO EMT OUTSIDE OF ARRAY.

DC-DC OPTIMIZER SOLAREDGE P850

FIELD INSTALLED CONNECTOR, 1000V RATED, MATCH MODEL ON MODULE. (TYPICAL 2 PER STRING)

INSTALL STRING # LABELS (TYPICAL) ON BOTH ENDS OF POSITIVE AND NEGATIVE HOMERUNS USING HEAT SHRINK LABELS SUITABLE FOR THE ENVIRONMENT

SYSTEM A SUMMARY	
DC SYSTEM SIZE	674.40 KW
AC SYSTEM SIZE	532.80 KW
MODULE	LG400N2W-A5 400W
MODULE QTY	1686
INVERTER	SOLAREDGE 33.3KUS
INVERTER QTY	16
AZIMUTH / TILT	197° OR 173° / 5°

OVERCURRENT RELAY NOTES:
THE OVERCURRENT 51-RELAY IS INTENDED TO PROTECT THE EXISTING CUSTOMER SWITCHGEAR.
1. AN OVERCURRENT CONDITION SHALL CLOSE THE 51-RELAY CONTACT, ACTIVATING THE SHUNT TRIP IN THE SOLAR MAIN CIRCUIT BREAKER A.
2. OVERCURRENT RELAY SET TO 100% OF BUS RATING (3000A) TO ENSURE NEC 705.12(D)(2) CAN NOT BE VIOLATED.
3. CT'S SHALL BE 3000:5, .3%B0.1RF1.5

1 / E300 ONE LINE DIAGRAM - SYSTEM A
SCALE: NONE

DATE	REVISION DESCRIPTION	PM	ENG CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC RI

PUREPOWER ENGINEERING
5 MARINE VIEW PLAZA, HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. WINS
CT LICENSE No. 0023462

DEVELOPER: Safari Energy

SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK 10018
WWW.SAFARIENERGY.COM

PAGE SIZE: 36" x 24"
PROJECT #: PPE 18.087

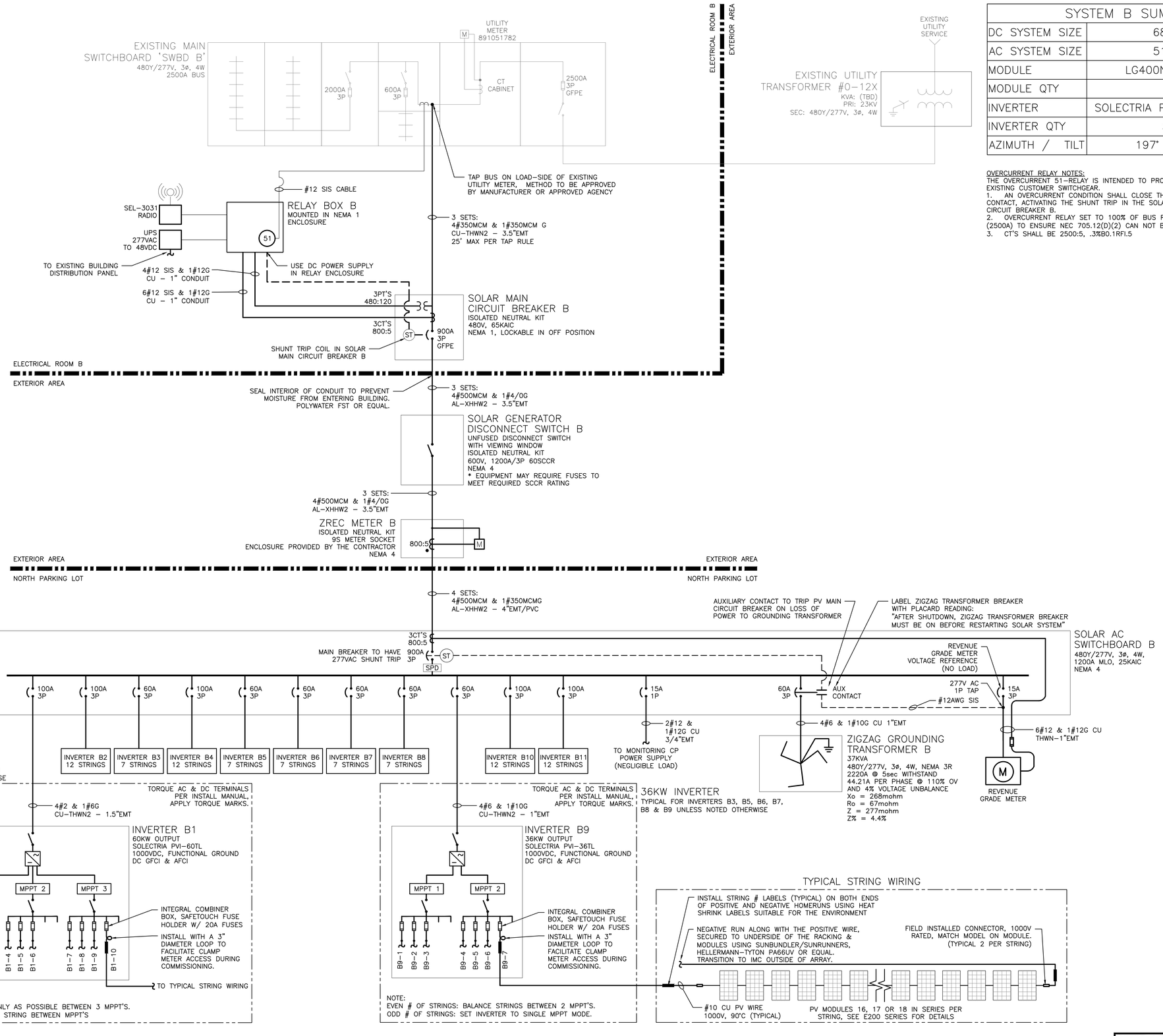
DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 338
ORIENTATION: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

20 OF 32
DRAWING #: E300

DRAWING TITLE
ONE LINE DIAGRAM
SYSTEM A ROOFTOP

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18



1 E301 ONE LINE DIAGRAM - SYSTEM B
SCALE: NONE

SYSTEM B SUMMARY	
DC SYSTEM SIZE	688.80 KW
AC SYSTEM SIZE	516.00 KW
MODULE	LG400N2W-A5 400W
MODULE QTY	1722
INVERTER	SOLECTRIA PVI60TL OR PVI36TL
INVERTER QTY	5 OR 6
AZIMUTH / TILT	197° / 3° OR 1°

OVERCURRENT RELAY NOTES:
THE OVERCURRENT 51-RELAY IS INTENDED TO PROTECT THE EXISTING CUSTOMER SWITCHGEAR.
1. AN OVERCURRENT CONDITION SHALL CLOSE THE 51-RELAY CONTACT, ACTIVATING THE SHUNT TRIP IN THE SOLAR MAIN CIRCUIT BREAKER B.
2. OVERCURRENT RELAY SET TO 100% OF BUS RATING (2500A) TO ENSURE NEC 705.12(D)(2) CAN NOT BE VIOLATED.
3. CT'S SHALL BE 2500:5, .3%B0.1RFI.5

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

PUREPOWER ENGINEERING, LLC
5 MARINE VIEW PLAZA, HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. WINDS
CT LICENSE No. 0023462

DEVELOPER: Safari Energy
PAGE SIZE: 36" x 24"
PROJECT #: PPE 18.087
DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 328
OPERATIONS: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK, 10018
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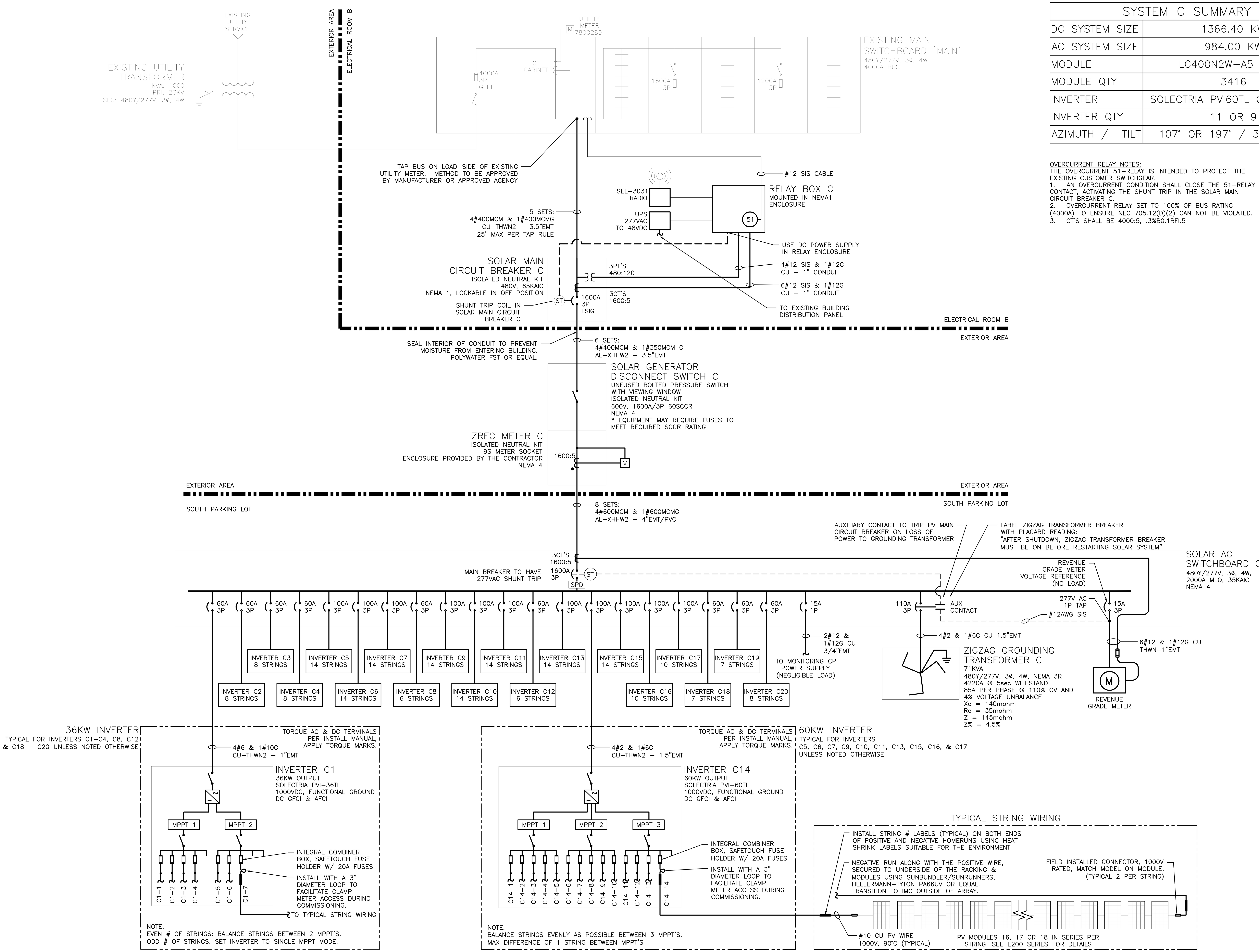
DRAWING TITLE
ONE LINE DIAGRAM
SYSTEM B NORTH CARPORT

21 OF 32
DRAWING # E301

PLOT DATE: 10/22/2018 2:13 PM
RULER IN INCHES: 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 ½ 0

SYSTEM C SUMMARY	
DC SYSTEM SIZE	1366.40 KW
AC SYSTEM SIZE	984.00 KW
MODULE	LG400N2W-A5 400W
MODULE QTY	3416
INVERTER	SOLECTRIA PVI60TL OR PVI36TL
INVERTER QTY	11 OR 9
AZIMUTH / TILT	107° OR 197° / 3° OR -3°

OVERCURRENT RELAY NOTES:
THE OVERCURRENT 51-RELAY IS INTENDED TO PROTECT THE EXISTING CUSTOMER SWITCHGEAR.
1. AN OVERCURRENT CONDITION SHALL CLOSE THE 51-RELAY CONTACT, ACTIVATING THE SHUNT TRIP IN THE SOLAR MAIN CIRCUIT BREAKER C.
2. OVERCURRENT RELAY SET TO 100% OF BUS RATING (4000A) TO ENSURE NEC 705.12(D)(2) CAN NOT BE VIOLATED.
3. CT'S SHALL BE 4000:5, .3%B0.1RF1.5



EXISTING UTILITY SERVICE
EXISTING UTILITY TRANSFORMER
KVA: 1000
PRI: 23KV
SEC: 480Y/277V, 3Ø, 4W
EXTERIOR AREA
ELECTRICAL ROOM B
UTILITY METER 78002891
CT CABINET
4000A 3P GFPE
1600A 3P
1200A 3P
EXISTING MAIN SWITCHBOARD 'MAIN'
480Y/277V, 3Ø, 4W
4000A BUS
TAP BUS ON LOAD-SIDE OF EXISTING UTILITY METER, METHOD TO BE APPROVED BY MANUFACTURER OR APPROVED AGENCY
#12 SIS CABLE
SEL-3031 RADIO
UPS 277VAC TO 48VDC
RELAY BOX C
MOUNTED IN NEMA1 ENCLOSURE
51
5 SETS: 4#400MCM & 1#400MCMG CU-THWN2 - 3.5"EMT 25' MAX PER TAP RULE
USE DC POWER SUPPLY IN RELAY ENCLOSURE
SOLAR MAIN CIRCUIT BREAKER C
ISOLATED NEUTRAL KIT
480V, 65KAIC
NEMA 1, LOCKABLE IN OFF POSITION
3PT'S 480:120
4#12 SIS & 1#12G CU - 1" CONDUIT
6#12 SIS & 1#12G CU - 1" CONDUIT
3CT'S 1600:5
1600A 3P LSIG
SHUNT TRIP COIL IN SOLAR MAIN CIRCUIT BREAKER C
TO EXISTING BUILDING DISTRIBUTION PANEL
ELECTRICAL ROOM B
EXTERIOR AREA
SEAL INTERIOR OF CONDUIT TO PREVENT MOISTURE FROM ENTERING BUILDING. POLYWATER FST OR EQUAL.
6 SETS: 4#400MCM & 1#350MCM G AL-XHHW2 - 3.5"EMT
SOLAR GENERATOR DISCONNECT SWITCH C
UNFUSED BOLTED PRESSURE SWITCH WITH VIEWING WINDOW
ISOLATED NEUTRAL KIT
600V, 1600A/3P 60SCCR
NEMA 4
* EQUIPMENT MAY REQUIRE FUSES TO MEET REQUIRED SCCR RATING
ZREC METER C
ISOLATED NEUTRAL KIT
9S METER SOCKET
ENCLOSURE PROVIDED BY THE CONTRACTOR
NEMA 4
1600:5
EXTERIOR AREA
SOUTH PARKING LOT
8 SETS: 4#600MCM & 1#600MCMG AL-XHHW2 - 4"EMT/PVC
AUXILIARY CONTACT TO TRIP PV MAIN CIRCUIT BREAKER ON LOSS OF POWER TO GROUNDING TRANSFORMER
LABEL ZIGZAG TRANSFORMER BREAKER WITH PLACARD READING: "AFTER SHUTDOWN, ZIGZAG TRANSFORMER BREAKER MUST BE ON BEFORE RESTARTING SOLAR SYSTEM"
SOLAR AC SWITCHBOARD C
480Y/277V, 3Ø, 4W, 2000A MLO, 35KAIC
NEMA 4
3CT'S 1600:5
MAIN BREAKER TO HAVE 277VAC SHUNT TRIP
1600A 3P
ST
SPD
REVENUE GRADE METER VOLTAGE REFERENCE (NO LOAD)
277V AC 1P TAP
60A 3P
100A 3P
15A 1P
110A 3P
AUX CONTACT
#12AWG SIS
15A 3P
2#12 & 1#12G CU 3/4"EMT
TO MONITORING CP POWER SUPPLY (NEGLIGIBLE LOAD)
4#2 & 1#6G CU 1.5"EMT
6#12 & 1#12G CU THWN-1"EMT
ZIGZAG GROUNDING TRANSFORMER C
71KVA
480Y/277V, 3Ø, 4W, NEMA 3R
4220A @ 5sec WITHSTAND
85A PER PHASE @ 110% OV AND 4% VOLTAGE UNBALANCE
Xo = 140mohm
Ro = 35mohm
Z = 145mohm
Z% = 4.5%
REVENUE GRADE METER
INVERTER C3 8 STRINGS
INVERTER C5 14 STRINGS
INVERTER C7 14 STRINGS
INVERTER C9 14 STRINGS
INVERTER C11 14 STRINGS
INVERTER C13 14 STRINGS
INVERTER C15 14 STRINGS
INVERTER C17 10 STRINGS
INVERTER C19 7 STRINGS
INVERTER C2 8 STRINGS
INVERTER C4 8 STRINGS
INVERTER C6 14 STRINGS
INVERTER C8 6 STRINGS
INVERTER C10 14 STRINGS
INVERTER C12 6 STRINGS
INVERTER C16 10 STRINGS
INVERTER C18 7 STRINGS
INVERTER C20 8 STRINGS
36KW INVERTER
TYPICAL FOR INVERTERS C1-C4, C8, C12 & C18 - C20 UNLESS NOTED OTHERWISE
TORQUE AC & DC TERMINALS PER INSTALL MANUAL, APPLY TORQUE MARKS.
4#6 & 1#10G CU-THWN2 - 1"EMT
INVERTER C1
36KW OUTPUT
SOLECTRIA PVI-36TL
1000VDC, FUNCTIONAL GROUND
DC GFCI & AFCI
MPPT 1
MPPT 2
INTEGRAL COMBINER BOX, SAFETOUCH FUSE HOLDER W/ 20A FUSES
INSTALL WITH A 3" DIAMETER LOOP TO FACILITATE CLAMP METER ACCESS DURING COMMISSIONING.
C1-1
C1-2
C1-3
C1-4
C1-5
C1-6
C1-7
TO TYPICAL STRING WIRING
NOTE:
EVEN # OF STRINGS: BALANCE STRINGS BETWEEN 2 MPPT'S.
ODD # OF STRINGS: SET INVERTER TO SINGLE MPPT MODE.
TORQUE AC & DC TERMINALS PER INSTALL MANUAL. APPLY TORQUE MARKS.
60KW INVERTER
TYPICAL FOR INVERTERS C5, C6, C7, C9, C10, C11, C13, C15, C16, & C17 UNLESS NOTED OTHERWISE
4#2 & 1#6G CU-THWN2 - 1.5"EMT
INVERTER C14
60KW OUTPUT
SOLECTRIA PVI-60TL
1000VDC, FUNCTIONAL GROUND
DC GFCI & AFCI
MPPT 1
MPPT 2
MPPT 3
INTEGRAL COMBINER BOX, SAFETOUCH FUSE HOLDER W/ 20A FUSES
INSTALL WITH A 3" DIAMETER LOOP TO FACILITATE CLAMP METER ACCESS DURING COMMISSIONING.
C14-1
C14-2
C14-3
C14-4
C14-5
C14-6
C14-7
C14-8
C14-9
C14-10
C14-11
C14-12
C14-13
C14-14
NOTE:
BALANCE STRINGS EVENLY AS POSSIBLE BETWEEN 3 MPPT'S.
MAX DIFFERENCE OF 1 STRING BETWEEN MPPT'S
TYPICAL STRING WIRING
INSTALL STRING # LABELS (TYPICAL) ON BOTH ENDS OF POSITIVE AND NEGATIVE HOMERUNS USING HEAT SHRINK LABELS SUITABLE FOR THE ENVIRONMENT
NEGATIVE RUN ALONG WITH THE POSITIVE WIRE, SECURED TO UNDERSIDE OF THE RACKING & MODULES USING SUNBUNDLER/SUNRUNNERS, HELLERMANN-TYTON PA66UV OR EQUAL. TRANSITION TO IMC OUTSIDE OF ARRAY.
FIELD INSTALLED CONNECTOR, 1000V RATED, MATCH MODEL ON MODULE. (TYPICAL 2 PER STRING)
#10 CU PV WIRE 1000V, 90°C (TYPICAL)
PV MODULES 16, 17 OR 18 IN SERIES PER STRING, SEE E200 SERIES FOR DETAILS

1 / E302 ONE LINE DIAGRAM - SYSTEM C
SCALE: NONE

PLOT DATE: 10/22/2018 2:13 PM

RULER IN INCHES:

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

PUREPOWER ENGINEERING
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DEVELOPER
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Safari Energy

PAGE SIZE 36" x 24"
PROJECT # PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 329
ORIENTATION: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

DRAWING TITLE
ONE LINE DIAGRAM
SYSTEM C SOUTH CARPORT

DRAWING #
E302

AC FEEDER CALCULATIONS - SYSTEM A

FEEDER DESCRIPTION	VOLTAGE	FULL LOAD AMPS 'FLA'	FLA x 1.25	OCPD SIZE	GROUND SIZE	CONDUCTORS PER PHASE	CONDUCTOR SIZE	75° AMPACITY	C.O.U DERATE AMBIENT TEMP	C.O.U. DERATE CONDUIT FILL	90° AMPACITY WITH C.O.U.	FEEDER LENGTH (FEET)	SEGMENT VOLTAGE DROP AT FLA	TOTALVOLTAGE DROP AT FLA
INTERCONNECTION A TO SOLAR CIRCUIT BREAKER A	480	640.0	800.0	800	CU 400MCM	3	CU 400MCM	1005	1.00	1.00	1140.0	10	0.03%	0.03%
SOLAR MAIN CIRCUIT BREAKER A TO SOLAR GENERATOR DISCONNECT SWITCH A	480	640.0	800.0	800	AL #3/0	3	AL 400MCM	810	1.00	1.00	915.0	10	0.04%	0.07%
SOLAR GENERATOR DISCONNECT SWITCH A TO ZREC METER A	480	640.0	800.0	800	AL #3/0	3	AL 400MCM	810	1.00	1.00	915.0	10	0.04%	0.11%
ZREC METER A TO SOLAR AC PANELBOARD A	480	640.0	800.0	800	AL #3/0	3	AL 400MCM	810	1.00	1.00	915.0	10	0.04%	0.15%
SOLAR AC PANELBOARD A TO SOLAR AC SUBPANEL A1	480	320.0	400.0	400	AL #1/0	2	AL 250MCM	410	1.00	1.00	460.0	460	2.28%	2.44%
SOLAR AC PANELBOARD A TO SOLAR AC SUBPANEL A2	480	320.0	400.0	400	AL #1/0	2	AL 250MCM	410	1.00	1.00	460.0	320	1.59%	1.74%
SOLAR AC SUBPANEL A1 TO INVERTERS A1 - A8	480	40.0	50.0	60	CU #10	1	CU #6	65	1.00	1.00	75.0	30	0.21%	2.65%
SOLAR AC SUBPANEL A2 TO INVERTERS A9 - A16	480	40.0	50.0	60	CU #10	1	CU #6	65	1.00	1.00	75.0	30	0.21%	1.96%

AVERAGE AC VOLTAGE DROP FROM POI TO INVERTERS: 2.31%

AC FEEDER CALCULATIONS - SYSTEM B

FEEDER DESCRIPTION	VOLTAGE	FULL LOAD AMPS 'FLA'	FLA x 1.25	OCPD SIZE	GROUND SIZE	CONDUCTORS PER PHASE	CONDUCTOR SIZE	75° AMPACITY	C.O.U DERATE AMBIENT TEMP	C.O.U. DERATE CONDUIT FILL	90° AMPACITY WITH C.O.U.	FEEDER LENGTH (FEET)	SEGMENT VOLTAGE DROP AT FLA	TOTALVOLTAGE DROP AT FLA
INTERCONNECTION B TO SOLAR CIRCUIT BREAKER B	480	658.0	822.5	900	CU 350MCM	3	CU 350MCM	930	1.00	1.00	1050.0	10	0.03%	0.03%
SOLAR MAIN CIRCUIT BREAKER B TO SOLAR GENERATOR DISCONNECT SWITCH B	480	658.0	822.5	900	AL #4/0	3	AL 500MCM	930	1.00	1.00	1050.0	10	0.04%	0.07%
SOLAR GENERATOR DISCONNECT SWITCH B TO ZREC METER B	480	658.0	822.5	900	AL #4/0	3	AL 500MCM	930	1.00	1.00	1050.0	100	0.36%	0.42%
ZREC METER B TO SOLAR AC SWITCHBOARD B	480	658.0	822.5	900	AL 350MCM	4	AL 500MCM	1240	1.00	1.00	1400.0	700	1.87%	2.29%
SOLAR AC SWITCHBOARD B TO INVERTERS B1	480	79.4	99.3	100	CU #6	1	CU #2	115	1.00	1.00	130.0	30	0.17%	2.46%
SOLAR AC SWITCHBOARD B TO INVERTERS B2	480	79.4	99.3	100	CU #6	1	CU #2	115	1.00	1.00	130.0	30	0.17%	2.52%
SOLAR AC SWITCHBOARD B TO INVERTERS B3	480	43.5	54.4	60	CU #10	1	CU #6	65	1.00	1.00	75.0	30	0.23%	2.46%
SOLAR AC SWITCHBOARD B TO INVERTERS B4	480	79.4	99.3	100	CU #6	1	CU #2	115	1.00	1.00	130.0	30	0.17%	2.52%
SOLAR AC SWITCHBOARD B TO INVERTERS B5	480	43.5	54.4	60	CU #10	1	CU #6	65	1.00	1.00	75.0	30	0.23%	2.52%
SOLAR AC SWITCHBOARD B TO INVERTERS B6	480	43.5	54.4	60	CU #10	1	CU #6	65	1.00	1.00	75.0	30	0.23%	2.52%
SOLAR AC SWITCHBOARD B TO INVERTERS B7	480	43.5	54.4	60	CU #10	1	CU #6	65	1.00	1.00	75.0	30	0.23%	2.52%
SOLAR AC SWITCHBOARD B TO INVERTERS B8	480	43.5	54.4	60	CU #10	1	CU #6	65	1.00	1.00	75.0	30	0.23%	2.52%
SOLAR AC SWITCHBOARD B TO INVERTERS B9	480	43.5	54.4	60	CU #10	1	CU #6	65	1.00	1.00	75.0	30	0.23%	2.46%
SOLAR AC SWITCHBOARD B TO INVERTERS B10	480	79.4	99.3	100	CU #6	1	CU #2	115	1.00	1.00	130.0	30	0.17%	2.46%
SOLAR AC SWITCHBOARD B TO INVERTERS B11	480	79.4	99.3	100	CU #6	1	CU #2	115	1.00	1.00	130.0	30	0.17%	2.29%

AVERAGE AC VOLTAGE DROP FROM POI TO INVERTERS: 2.47%

AC FEEDER CALCULATIONS - SYSTEM C

FEEDER DESCRIPTION	VOLTAGE	FULL LOAD AMPS 'FLA'	FLA x 1.25	OCPD SIZE	GROUND SIZE	CONDUCTORS PER PHASE	CONDUCTOR SIZE	75° AMPACITY	C.O.U DERATE AMBIENT TEMP	C.O.U. DERATE CONDUIT FILL	90° AMPACITY WITH C.O.U.	FEEDER LENGTH (FEET)	SEGMENT VOLTAGE DROP AT FLA	TOTALVOLTAGE DROP AT FLA
INTERCONNECTION C TO SOLAR CIRCUIT BREAKER C	480	1264.9	1581.1	1600	CU 400MCM	5	CU 400MCM	1675	1.00	1.00	1900.0	10	0.03%	0.03%
SOLAR MAIN CIRCUIT BREAKER C TO SOLAR GENERATOR DISCONNECT SWITCH C	480	1264.9	1581.1	1600	AL350MCM	6	AL 400MCM	1620	1.00	1.00	1830.0	10	0.04%	0.07%
SOLAR GENERATOR DISCONNECT SWITCH C TO ZREC METER C	480	1264.9	1581.1	1600	AL 350MCM	6	AL 400MCM	1620	1.00	1.00	1830.0	100	0.42%	0.49%
ZREC METER C TO SOLAR AC SWITCHBOARD C	480	1264.9	1581.1	1600	AL 600MCM	8	AL 600MCM	2720	1.00	1.00	3080.0	900	1.95%	2.44%
SOLAR AC SWITCHBOARD C TO INVERTERS C1	480	43.5	54.4	60	CU #10	1	CU #6	65	1.00	1.00	75.0	30	0.23%	2.67%
SOLAR AC SWITCHBOARD C TO INVERTERS C2	480	43.5	54.4	60	CU #10	1	CU #6	65	1.00	1.00	75.0	30	0.23%	2.67%
SOLAR AC SWITCHBOARD C TO INVERTERS C3	480	43.5	54.4	60	CU #10	1	CU #6	65	1.00	1.00	75.0	30	0.23%	2.67%
SOLAR AC SWITCHBOARD C TO INVERTERS C4	480	43.5	54.4	60	CU #10	1	CU #6	65	1.00	1.00	75.0	30	0.23%	2.67%
SOLAR AC SWITCHBOARD C TO INVERTERS C5	480	79.4	99.3	100	CU #6	1	CU #2	115	1.00	1.00	130.0	30	0.17%	2.62%
SOLAR AC SWITCHBOARD C TO INVERTERS C6	480	79.4	99.3	100	CU #6	1	CU #2	115	1.00	1.00	130.0	30	0.17%	2.62%
SOLAR AC SWITCHBOARD C TO INVERTERS C7	480	79.4	99.3	100	CU #6	1	CU #2	115	1.00	1.00	130.0	30	0.17%	2.62%
SOLAR AC SWITCHBOARD C TO INVERTERS C8	480	43.5	54.4	60	CU #10	1	CU #6	65	1.00	1.00	75.0	30	0.23%	2.67%
SOLAR AC SWITCHBOARD C TO INVERTERS C9	480	79.4	99.3	100	CU #6	1	CU #2	115	1.00	1.00	130.0	30	0.17%	2.62%
SOLAR AC SWITCHBOARD C TO INVERTERS C10	480	79.4	99.3	100	CU #6	1	CU #2	115	1.00	1.00	130.0	30	0.17%	2.62%
SOLAR AC SWITCHBOARD C TO INVERTERS C11	480	79.4	99.3	100	CU #6	1	CU #2	115	1.00	1.00	130.0	30	0.17%	2.62%
SOLAR AC SWITCHBOARD C TO INVERTERS C12	480	43.5	54.4	60	CU #10	1	CU #6	65	1.00	1.00	75.0	30	0.23%	2.67%
SOLAR AC SWITCHBOARD C TO INVERTERS C13	480	79.4	99.3	100	CU #6	1	CU #2	115	1.00	1.00	130.0	30	0.17%	2.62%
SOLAR AC SWITCHBOARD C TO INVERTERS C14	480	79.4	99.3	100	CU #6	1	CU #2	115	1.00	1.00	130.0	30	0.17%	2.62%
SOLAR AC SWITCHBOARD C TO INVERTERS C15	480	79.4	99.3	100	CU #6	1	CU #2	115	1.00	1.00	130.0	30	0.17%	2.62%
SOLAR AC SWITCHBOARD C TO INVERTERS C16	480	79.4	99.3	100	CU #6	1	CU #2	115	1.00	1.00	130.0	30	0.17%	2.62%
SOLAR AC SWITCHBOARD C TO INVERTERS C17	480	79.4	99.3	100	CU #8	1	CU #2	115	1.00	1.00	130.0	30	0.17%	2.62%
SOLAR AC SWITCHBOARD C TO INVERTERS C18	480	43.5	54.4	60	CU #10	1	CU #6	65	1.00	1.00	75.0	30	0.23%	2.67%
SOLAR AC SWITCHBOARD C TO INVERTERS C19	480	43.5	54.4	60	CU #10	1	CU #6	65	1.00	1.00	75.0	30	0.23%	2.67%
SOLAR AC SWITCHBOARD C TO INVERTERS C20	480	43.5	54.4	60	CU #10	1	CU #6	65	1.00	1.00	75.0	30	0.23%	2.67%

AVERAGE AC VOLTAGE DROP FROM POI TO INVERTERS: 2.92%

SOLAREDGE SE33.3KUS

INVERTER SPECIFICATIONS	
RATED AC OUTPUT POWER	33,300 W
NOMINAL AC OUTPUT VOLTAGE	480Y/277 V
MAX. AC OUTPUT CURRENT	40 A
INVERTER PROTECTIVE SETTINGS	
PARAMETERS	SET AT
AC FREQUENCY RANGE	59.3 Hz – 60.5 Hz (DEFAULT)
AC VOLTAGE RANGE	244 V – 305 V (DEFAULT)
POWER FACTOR	1.0 (DEFAULT)
OVERFREQUENCY TRIP TIME	0.16S (DEFAULT)
UNDERFREQUENCY TRIP TIME	0.16S (DEFAULT)
OVERVOLTAGE TRIP TIME (FAST)	0.16S (DEFAULT)
OVERVOLTAGE TRIP TIME (SLOW)	1.0S (DEFAULT)
UNDERVOLTAGE TRIP TIME (FAST)	0.16S (DEFAULT)
UNDERVOLTAGE TRIP TIME (SLOW)	2.0S (DEFAULT)

SOLECTRIA PVI 60TL

INVERTER SPECIFICATIONS	
RATED AC OUTPUT POWER	60,000 W
NOMINAL AC OUTPUT VOLTAGE	480Y/277 V
MAX. AC OUTPUT CURRENT	79.4 A
INVERTER PROTECTIVE SETTINGS	
PARAMETERS	SET AT
AC FREQUENCY RANGE	57 Hz – 63 Hz (DEFAULT)
AC VOLTAGE RANGE	422.4 V – 528 V (DEFAULT)
POWER FACTOR	>0.99 (DEFAULT)
OVERFREQUENCY TRIP TIME	0.16S (DEFAULT)
UNDERFREQUENCY TRIP TIME	0.16S (DEFAULT)
OVERVOLTAGE TRIP TIME (FAST)	0.16S (DEFAULT)
OVERVOLTAGE TRIP TIME (SLOW)	1.0S (DEFAULT)
UNDERVOLTAGE TRIP TIME (FAST)	0.16S (DEFAULT)
UNDERVOLTAGE TRIP TIME (SLOW)	2.0S (DEFAULT)

SOLECTRIA PVI 36TL

INVERTER SPECIFICATIONS	
RATED AC OUTPUT POWER	36000 W
NOMINAL AC OUTPUT VOLTAGE	480Y/277 V
MAX. AC OUTPUT CURRENT	43.5 A
INVERTER PROTECTIVE SETTINGS	
PARAMETERS	SET AT
AC FREQUENCY RANGE	59.3 Hz – 60.5 Hz (DEFAULT)
AC VOLTAGE RANGE	422.4 V – 528 V (DEFAULT)
POWER FACTOR	>0.99 (DEFAULT)
OVERFREQUENCY TRIP TIME	0.16S (DEFAULT)
UNDERFREQUENCY TRIP TIME	0.16S (DEFAULT)
OVERVOLTAGE TRIP TIME (FAST)	0.16S (DEFAULT)
OVERVOLTAGE TRIP TIME (SLOW)	1.0S (DEFAULT)
UNDERVOLTAGE TRIP TIME (FAST)	0.16S (DEFAULT)
UNDERVOLTAGE TRIP TIME (SLOW)	2.0S (DEFAULT)

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

PUREPOWER ENGINEERING
5 MARINE VIEW PLAZA HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. IVINS
CT LICENSE No. 0029262

DEVELOPER
SAFARI ENERGY, LLC
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK 10018
WWW.SAFARIENERGY.COM
Safari Energy

PAGE SIZE 36" x 24"
PROJECT # PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 329
ORIENTATION: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

DRAWING TITLE
SCHEDULES & CALCULATIONS

SOLECTRIA DC STRING WIRING CALCULATION

SHORT CIRCUIT CURRENT 'ISC' = 10.47A
MAXIMUM CIRCUIT CURRENT = 'ISC' X 1.25 = 13.09A PER 690.8(A)(1)
MINIMUM OVERCURRENT DEVICE CURRENT = MAXIMUM CIRCUIT CURRENT X 1.25 = 16.36A

WHEN IN CONDUIT, UP TO 20 CONDUCTORS IN CONDUIT 3.5" TO 12" ABOVE ROOFTOP:
AMBIENT TEMPERATURE = 32 °C
TEMPERATURE ADDER = 17°C
TEMPERATURE DERATE = 0.96
CONDUIT FILL DERATE = 0.5

75° AMPACITY OF #10CU BEFORE APPLICATION OF ADJUSTMENT FACTORS = 35A
35A IS GREATER THAN 16.36A SO OK PER 690.8(B)(1)

90° AMPACITY OF #10CU ADJUSTED FOR CONDITIONS OF USE = 40 x 0.96 x 0.5 = 19.2A
19.2A IS GREATER THAN 16.36A SO OK PER 690.8(B)(2)

WHEN IN CABLE TRAY 3.5" TO 12" ABOVE ROOFTOP:
AMBIENT TEMPERATURE = 32 °C
TEMPERATURE ADDER = 17 °C
TEMPERATURE DERATE = 0.96
CONDUIT FILL DERATE = N/A

90° AMPACITY OF #10CU PER NEC TABLE 310.15(B)(17) = 55A X 65% = 35.75A
90° AMPACITY OF #10CU WITH DERATE FOR C.O.U. = 35.75A X 0.96 = 34.32A
34.32A IS GREATER THAN 125% OF 13.09A

SOLAREDGE DC STRING WIRING CALCULATION

1. PV MODULE TO DC OPTIMIZER
SHORT CIRCUIT CURRENT 'ISC' = 10.47A
MAXIMUM CIRCUIT CURRENT = 'ISC' X 1.25 = 13.09A PER 690.8(A)(1)
MINIMUM OVERCURRENT DEVICE CURRENT = MAXIMUM CIRCUIT CURRENT X 1.25 = 16.36A

WHEN IN CONDUIT, UP TO 20 CONDUCTORS IN CONDUIT 3.5" TO 12" ABOVE ROOFTOP:
AMBIENT TEMPERATURE = 32 °C
TEMPERATURE ADDER = 17°C
TEMPERATURE DERATE = 0.82
CONDUIT FILL DERATE = 0.5

75° AMPACITY OF #8CU BEFORE APPLICATION OF ADJUSTMENT FACTORS = 50A
50A IS GREATER THAN 16.36A SO OK PER 690.8(B)(1)

90° AMPACITY OF #8CU ADJUSTED FOR CONDITIONS OF USE = 55 x 0.82 x 0.5 = 22.55A
22.55A IS GREATER THAN 16.36A SO OK PER 690.8(B)(2)

2. DC OPTIMIZER TO INVERTER:
MAXIMUM CIRCUIT CURRENT OF DC OPTIMIZER = 18A
MINIMUM OVERCURRENT DEVICE CURRENT = MAXIMUM CIRCUIT CURRENT X 1.25 = 22.5A
SO THE OCPD SIZE = 25A
WHEN IN CONDUIT, UP TO 20 CONDUCTORS IN CONDUIT 3.5" TO 12" ABOVE ROOFTOP:
AMBIENT TEMPERATURE = 32 °C
TEMPERATURE ADDER = 17 °C
TEMPERATURE DERATE = 0.82
CONDUIT FILL DERATE = 0.5

75° AMPACITY OF #8CU BEFORE APPLICATION OF ADJUSTMENT FACTORS = 50A
50A IS GREATER THAN 22.5A SO OK PER 690.8(B)(1)

90° AMPACITY OF #8CU ADJUSTED FOR CONDITIONS OF USE = 55 X 0.82 X 0.5 = 22.55A
22.55A IS GREATER THAN 22.5A SO OK PER 690.8(B)(2)

SOLECTRIA DC STRING FUSE CALCULATION

SHORT CIRCUIT CURRENT 'ISC' = 10.43A
MAXIMUM CIRCUIT CURRENT = 'ISC' X 1.25 = 13.04A PER 690.8(A)(1)
MINIMUM FUSE RATING = MAXIMUM CIRCUIT CURRENT X 1.25 = 16.30A PER 690.9(B)(1)

20A FUSE IS GREATER THAN 16.30A SO OK PER 690.9(B)(1)

SOLECTRIA STRING MAXIMUM VOLTAGE CALCULATION

Voc TEMP ADJUSTMENT AT 5°C = 1 − [βVoc * ΔT]/100
1 − [−0.26 * (25−(−20))]/100
1.117

Voc @ 5°C = Voc @ 25°C * TEMP ADJUSTMENT FACTOR
49.3 * 1.117
55.068V

STRING Voc = Voc @ −20°C * # MODULES/STRING
55.068V * 18
991.225V (MUST BE UNDER 1000V)

SOLAREDGE 33.3KW
MAXIMUM INPUT VOLTAGE: 980VDC
NOMINAL INPUT VOLTAGE: 840VDC

MODULE SPECIFICATIONS AT STC
Power: 400W
Isc: 10.47A
Imp: 9.86A
Voc: 49.3V
βVoc: −0.26%/°C

SITE CLIMATE CRITERIA
ASHRAE HIGH TEMP: 32°C
ASHRAE LOW TEMP: −20°C

NOTE: DISTANCES ARE ESTIMATES GENERATED FOR ENGINEER'S CALCULATIONS, CONTRACTOR IS RESPONSIBLE FOR OWN MEASUREMENTS AND TAKEOFFS.

STRING SPECIFICATIONS AT STC
MODULES/STRING: 36
Power: 14,400W
Imp: 18A

STRING SPECIFICATIONS AT STC
MODULES/STRING: 34
Power: 13,600W
Imp: 18A

STRING SPECIFICATIONS AT STC
MODULES/STRING: 18
Power: 7,200W
Imp: 10.47A

STRING SPECIFICATIONS AT STC
MODULES/STRING: 17
Power: 6,800W
Imp: 10.47A

STRING SPECIFICATIONS AT STC
MODULES/STRING: 16
Power: 6,400W
Imp: 10.47A

INVERTERS A1 THRU A16

STRING NUMBER	STRING TO INVERTER WIRE GAUGE	STRING TO INVERTER RESISTANCE (Ω/ft)	STRING DISTANCE (FEET)	STRING VOLTAGE DROP
A1−1	#8	0.000778	410	1.35%
A1−2	#8	0.000778	395	1.30%
A1−3	#8	0.000778	340	1.12%
A2−1	#8	0.000778	400	1.32%
A2−2	#8	0.000778	375	1.24%
A2−3	#8	0.000778	475	1.57%
A3−1	#8	0.000778	375	1.24%
A3−2	#8	0.000778	360	1.19%
A3−3	#8	0.000778	185	0.61%
A4−1	#8	0.000778	295	0.97%
A4−2	#8	0.000778	250	0.82%
A4−3	#8	0.000778	255	0.84%
A5−1	#8	0.000778	295	0.97%
A5−2	#8	0.000778	260	0.86%
A5−3	#8	0.000778	240	0.79%
A6−1	#8	0.000778	215	0.71%
A6−2	#8	0.000778	270	0.89%
A6−3	#8	0.000778	165	0.54%
A7−1	#8	0.000778	110	0.36%
A7−2	#8	0.000778	155	0.51%
A7−3	#8	0.000778	165	0.54%
A8−1	#8	0.000778	175	0.58%
A8−2	#8	0.000778	185	0.61%
A8−3	#8	0.000778	205	0.68%
A9−1	#8	0.000778	240	0.79%
A9−2	#8	0.000778	235	0.77%
A9−3	#8	0.000778	275	0.91%
A10−1	#8	0.000778	145	0.48%
A10−2	#8	0.000778	170	0.56%
A10−3	#8	0.000778	190	0.63%
A11−1	#8	0.000778	230	0.76%
A11−2	#8	0.000778	250	0.82%
A11−3	#8	0.000778	415	1.37%
A12−1	#8	0.000778	105	0.35%
A12−2	#8	0.000778	105	0.35%
A12−3	#8	0.000778	170	0.56%
A13−1	#8	0.000778	165	0.54%
A13−2	#8	0.000778	190	0.63%
A13−3	#8	0.000778	220	0.72%
A14−1	#8	0.000778	225	0.74%
A14−2	#8	0.000778	215	0.71%
A14−3	#8	0.000778	235	0.77%
A15−1	#8	0.000778	280	0.92%
A15−2	#8	0.000778	265	0.87%
A15−3	#8	0.000778	345	1.14%
A16−1	#8	0.000778	315	1.04%
A16−2	#8	0.000778	330	1.09%
A16−3	#8	0.000778	365	1.20%
AVERAGE STRING VOLTAGE DROP				0.83%

INVERTERS B1 THRU B11

STRING NUMBER	STRING TO INVERTER WIRE GAUGE	STRING TO INVERTER IMPEDANCE (Ω/ft)	STRING DISTANCE (FEET)	STRING VOLTAGE DROP
B1−1	#10	0.00124	190	0.47%
B1−2	#10	0.00124	205	0.51%
B1−3	#10	0.00124	165	0.41%
B1−4	#10	0.00124	180	0.44%
B1−5	#10	0.00124	140	0.35%
B1−6	#10	0.00124	150	0.37%
B1−7	#10	0.00124	110	0.27%
B1−8	#10	0.00124	125	0.31%
B1−9	#10	0.00124	80	0.20%
B1−10	#10	0.00124	95	0.23%
B1−11	#10	0.00124	375	0.93%
B1−12	#10	0.00124	385	0.95%
B2−1	#10	0.00124	285	0.70%
B2−2	#10	0.00124	405	1.00%
B2−3	#10	0.00124	270	0.67%
B2−4	#10	0.00124	255	0.63%
B2−5	#10	0.00124	245	0.60%
B2−6	#10	0.00124	230	0.57%
B2−7	#10	0.00124	230	0.57%
B2−8	#10	0.00124	215	0.53%
B2−9	#10	0.00124	200	0.49%
B2−10	#10	0.00124	200	0.49%
B2−11	#10	0.00124	185	0.46%
B2−12	#10	0.00124	175	0.43%
B3−1	#10	0.00124	530	1.31%
B3−2	#10	0.00124	515	1.27%
B3−3	#10	0.00124	500	1.23%
B3−4	#10	0.00124	560	1.38%
B3−5	#10	0.00124	545	1.34%
B3−6	#10	0.00124	530	1.31%
B3−7	#10	0.00124	560	1.38%
B4−1	#10	0.00124	220	0.54%
B4−2	#10	0.00124	235	0.58%
B4−3	#10	0.00124	250	0.62%
B4−4	#10	0.00124	250	0.62%
B4−5	#10	0.00124	265	0.65%
B4−6	#10	0.00124	280	0.69%
B4−7	#10	0.00124	280	0.69%
B5−1	#10	0.00124	300	0.74%
B5−2	#10	0.00124	310	0.76%
B5−3	#10	0.00124	315	0.78%
B5−4	#10	0.00124	330	0.81%
B5−5	#10	0.00124	340	0.84%
B5−6	#10	0.00124	345	0.85%
B5−7	#10	0.00124	360	0.89%
B6−1	#10	0.00124	375	0.93%
B6−2	#10	0.00124	380	0.94%
B6−3	#10	0.00124	390	0.96%
B6−4	#10	0.00124	405	1.00%
B6−5	#10	0.00124	410	1.01%
B6−6	#10	0.00124	420	1.04%
B6−7	#10	0.00124	435	1.07%
B7−1	#10	0.00124	175	0.43%
B7−2	#10	0.00124	190	0.47%
B7−3	#10	0.00124	205	0.51%
B7−4	#10	0.00124	205	0.51%
B7−5	#10	0.00124	220	0.54%
B7−6	#10	0.00124	235	0.58%
B7−7	#10	0.00124	235	0.58%
B8−1	#10	0.00124	240	0.59%
B8−2	#10	0.00124	255	0.63%
B8−3	#10	0.00124	270	0.67%
B8−4	#10	0.00124	270	0.67%
B8−5	#10	0.00124	285	0.70%
B8−6	#10	0.00124	295	0.73%
B8−7	#10	0.00124	300	0.74%
B8−8	#10	0.00124	310	0.76%
B8−9	#10	0.00124	325	0.80%
B8−10	#10	0.00124	325	0.80%
B8−11	#10	0.00124	340	0.84%
B8−12	#10	0.00124	355	0.88%
B9−1	#10	0.00124	115	0.28%
B9−2	#10	0.00124	125	0.31%
B9−3	#10	0.00124	140	0.35%
B9−4	#10	0.00124	145	0.36%
B9−5	#10	0.00124	155	0.38%
B9−6	#10	0.00124	170	0.42%
B9−7	#10	0.00124	175	0.43%
AVERAGE STRING VOLTAGE DROP				0.69%

INVERTERS C1 THRU C7

STRING NUMBER	STRING TO INVERTER WIRE GAUGE	STRING TO INVERTER IMPEDANCE (Ω/ft)	STRING DISTANCE (FEET)	STRING VOLTAGE DROP
C1−1	#10	0.00124	475	1.17%
C1−2	#10	0.00124	485	1.20%
C1−3	#10	0.00124	445	1.10%
C1−4	#10	0.00124	455	1.12%
C1−5	#10	0.00124	420	1.04%
C1−6	#10	0.00124	430	1.06%
C1−7	#10	0.00124	395	0.97%
C1−8	#10	0.00124	405	1.00%
C2−1	#10	0.00124	370	0.91%
C2−2	#10	0.00124	375	0.93%
C2−3	#10	0.00124	345	0.85%
C2−4	#10	0.00124	350	0.86%
C2−5	#10	0.00124	315	0.78%
C2−6	#10	0.00124	320	0.79%
C2−7	#10	0.00124	290	0.72%
C2−8	#10	0.00124	295	0.73%
C3−1	#10	0.00124	265	0.65%
C3−2	#10	0.00124	265	0.65%
C3−3	#10	0.00124	240	0.59%
C3−4	#10	0.00124	240	0.59%
C3−5	#10	0.00124	215	0.53%
C3−6	#10	0.00124	210	0.52%
C3−7	#10	0.00124	185	0.46%
C3−8	#10	0.00124	185	0.46%
C4−1	#10	0.00124	165	0.41%
C4−2	#10	0.00124	155	0.38%
C4−3	#10	0.00124	135	0.33%
C4−4	#10	0.00124	130	0.32%
C4−5	#10	0.00124	110	0.27%
C4−6	#10	0.00124	105	0.26%
C4−7	#10	0.00124	80	0.20%
C5−1	#10	0.00124	550	1.36%
C5−2	#10	0.00124	535	1.32%
C5−3	#10	0.00124	520	1.28%
C5−4	#10	0.00124	520	1.28%
C5−5	#10	0.00124	510	1.26%
C5−6	#10	0.00124	495	1.22%
C5−7	#10	0.00124	495	1.22%
C5−8	#10	0.00124	480	1.18%
C5−9	#10	0.00124	470	1.16%
C5−10	#10	0.00124	470	1.16%
C5−11	#10	0.00124	455	1.12%
C5−12	#10	0.00124	440	1.09%
C5−13	#10	0.00124	440	1.09%
C5−14	#10	0.00124	430	1.06%
C6−1	#10	0.00124	405	1.00%
C6−2	#10	0.00124	405	1.00%
C6−3	#10	0.00124	390	0.96%
C6−4	#10	0.00124	375	0.93%
C6−5	#10	0.00124	375	0.93%
C6−6	#10	0.00124	365	0.90%
C6−7	#10	0.00124	350	0.86%
C6−8	#10	0.00124	350	0.86%
C6−9	#10	0.00124	335	0.83%
C6−10	#10	0.00124	325	0.80%
C6−11	#10	0.00124	320	0.79%
C6−12	#10	0.00124	310	0.76%
C6−13	#10	0.00124	295	0.73%
C6−14	#10	0.00124	295	0.73%
C7−1	#10	0.00124	285	0.70%
C7−2	#10	0.00124	275	0.68%
C7−3	#10	0.00124	275	0.68%
C7−4	#10	0.00124	260	0.64%
C7−5	#10	0.00124	245	0.60%
C7−6	#10	0.00124	245	0.60%
C7−7	#10	0.00124	235	0.58%
C7−8	#10	0.00124	220	0.54%
C7−9	#10	0.00124	220	0.54%
C7−10	#10	0.00124	205	0.51%
C7−11	#10	0.00124	195	0.48%
C7−12	#10	0.00124	195	0.48%
C7−13	#10	0.00124	180	0.44%
C7−14	#10	0.00124	165	0.41%

INVERTERS C8 THRU C14

STRING NUMBER	STRING TO INVERTER WIRE GAUGE	STRING TO INVERTER IMPEDANCE (Ω/ft)	STRING DISTANCE (FEET)	STRING VOLTAGE DROP
C8−1	#10	0.00124	170	0.42%
C8−2	#10	0.00124	155	0.38%
C8−3	#10	0.00124	145	0.36%
C8−4	#10	0.00124	145	0.36%
C8−5	#10	0.00124	130	0.32%
C8−6	#10	0.00124	115	0.28%
C9−1	#10	0.00124	600	1.48%
C9−2	#10	0.00124	585	1.44%
C9−3	#10	0.00124	575	1.42%
C9−4	#10	0.00124	570	1.41%
C9−5	#10	0.00124	560	1.38%
C9−6	#10	0.00124	545	1.34%
C9−7	#10	0.00124	545	1.34%
C9−8	#10	0.00124	530	1.31%
C9−9	#10	0.00124	520	1.28%
C9−10	#10	0.00124	520	1.28%
C9−11	#10	0.00124	505	1.25%
C9−12	#10	0.00124	490	1.21%
C9−13	#10	0.00124	490	1.21%
C9−14	#10	0.00124	480	1.18%
C10−1	#10	0.00124	470	1.16%
C10−2	#10	0.00124	470	1.16%
C10−3	#10	0.00124	455	1.12%
C10−4	#10	0.00124	445	1.10%
C10−5	#10	0.00124	440	1.09%
C10−6	#10	0.00124	430	1.06%
C10−7	#10	0.00124	415	1.02%
C10−8	#10	0.00124	415	1.02%
C10−9	#10	0.00124	400	0.99%
C10−10	#10	0.00124	390	0.96%
C10−11	#10	0.00124	390	0.96%
C10−12	#10	0.00124	375	0.93%
C10−13	#10	0.00124	365	0.90%
C10−14	#10	0.00124	360	0.89%
C11−1	#10	0.00124	340	0.84%
C11−2	#10	0.00124	325	0.80%
C11−3	#10	0.00124	325	0.80%
C11−4	#10	0.00124	310	0.76%
C11−5	#10	0.00124	300	0.74%
C11−6	#10	0.00124	300	0.74%
C11−7	#10	0.00124	285	0.70%
C11−8	#10	0.00124	270	0.67%
C11−9	#10	0.00124	270	0.67%
C11−10	#10	0.00124	260	0.64%
C11−11	#10	0.00124	245	0.60%
C11−12	#10	0.00124	245	0.60%
C11−13	#10	0.00124	230	0.57%
C11−14	#10	0.00124	220	0.54%
C12−1	#10	0.00124	220	0.54%
C12−2	#10	0.00124	210	0.52%
C12−3	#10	0.00124	195	0.48%
C12−4	#10	0.00124	195	0.48%
C12−5	#10	0.00124	180	0.44%
C12−6	#10	0.00124	170	0.42%
C13−1	#10	0.00124	600	1.48%
C13−2	#10	0.00124	585	1.44%
C13−3	#10	0.00124	570	1.41%
C13−4	#10	0.00124	570	1.41%
C13−5	#10	0.00124	560	1.38%
C13−6	#10	0.00124	545	1.34%
C13−7	#10	0.00124	545	1.34%
C13−8	#10	0.00124	530	1.31%
C13−9	#10	0.00124	520	1.28%
C13−10	#10	0.00124	520	1.28%
C13−11	#10	0.00124	505	1.25%
C13−12	#10	0.00124	490	1.21%
C13−13	#10	0.00124	490	1.21%
C13−14	#10	0.00124	480	1.18%
C14−1	#10	0.00124	470	1.16%
C14−2	#10	0.00124	470	1.16%
C14−3	#10	0.00124	455	1.12%
C14−4	#10	0.00124	440	1.09%
C14−5	#10	0.00124	440	1.09%
C14−6	#10	0.00124	430	1.06%
C14−7	#10	0.00124	415	1.02%
C14−8	#10	0.00124	415	1.02%
C14−9	#10	0.00124	400	0.99%
C14−10	#10	0.00124	390	0.96%
C14−11	#10	0.00124	390	0.96%
C14−12	#10	0.00124	375	0.93%
C14−13	#10	0.00124	360	0.89%
C14−14	#10	0.00124	360	0.89%

INVERTERS C15 THRU C20

STRING NUMBER	STRING TO INVERTER WIRE GAUGE	STRING TO INVERTER IMPEDANCE (Ω/ft)	STRING DISTANCE (FEET)	STRING VOLTAGE DROP
C15−1	#10	0.00124	350	0.86%
C15−2	#10	0.00124	340	0.84%
C15−3	#10	0.00124	340	0.84%
C15−4	#10	0.00124	325	0.80%
C15−5	#10	0.00124	310	0.76%
C15−6	#10	0.00124	310	0.76%
C15−7	#10	0.00124	300	0.74%
C15−8	#10	0.00124	285	0.70%
C15−9	#10	0.00124	285	0.70%
C15−10	#10	0.00124	270	0.67%
C15−11	#10	0.00124	260	0.64%
C15−12	#10	0.00124	260	0.64%
C15−13	#10	0.00124	245	0.60%
C15−14	#10	0.00124	230	0.57%
C16−1	#10	0.00124	390	0.96%
C16−2	#10	0.00124	380	0.94%
C16−3	#10	0.00124	365	0.90%
C16−4	#10	0.00124	360	0.89%
C16−5	#10	0.00124	345	0.85%
C16−6	#10	0.00124	330	0.81%
C16−7	#10	0.00124	330	0.81%
C16−8	#10	0.00124	315	0.78%
C16−9	#10	0.00124	305	0.75%
C16−10	#10	0.00124	295	0.73%
C17−1	#10	0.00124	555	1.37%
C17−2	#10	0.00124	540	1.33%
C17−3	#10	0.00124	530	1.31%
C17−4	#10	0.00124	525	1.30%
C17−5	#10	0.00124	510	1.26%
C17−6	#10	0.00124	500	1.23%
C17−7	#10	0.00124	495	1.22%
C17−8	#10	0.00124	480	1.18%
C17−9	#10	0.00124	470	1.16%
C17−10	#10	0.00124	455	1.12%
C18−1	#10	0.00124	460	1.14%
C18−2	#10	0.00124	450	1.11%
C18−3	#10	0.00124	435	1.07%
C18−4	#10	0.00124	435	1.07%
C18−5	#10	0.00124	420	1.04%
C18−6	#10	0.00124	410	1.01%
C18−7	#10	0.00124	410	1.01%
C18−8	#10	0.00124	395	0.97%
C19−1	#10	0.00124	385	0.95%
C19−2	#10	0.00124	385	0.95%
C19−3	#10	0.00124	370	0.91%
C19−4	#10	0.00124	360	0.89%
C19−5	#10	0.00124	355	0.88%
C19−6	#10	0.00124	335	0.83%
C20−1	#10	0.00124	585	1.44%
C20−2	#10	0.00124	575	1.42%
C20−3	#10	0.00124	560	1.38%
C20−4	#10	0.00124	545	1.34%
C20−5	#10	0.00124	530	1.31%
C20−6	#10	0.00124	520	1.28%
C20−7	#10	0.00124	505	1.25%
C20−8	#10	0.00124	490	1.21%
AVERAGE STRING VOLTAGE DROP				0.92%

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

PUREPOWER ENGINEERING
5 MARINE VIEW PLAZA HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. IVINS
CT LICENSE No. 0029262

DEVELOPER
Safari Energy
SAFARI ENERGY, LLC
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK 10018
WWW.SAFARIENERGY.COM

PAGE SIZE 36" x 24"
PROJECT # PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 329
ORIENTATION: VARIES

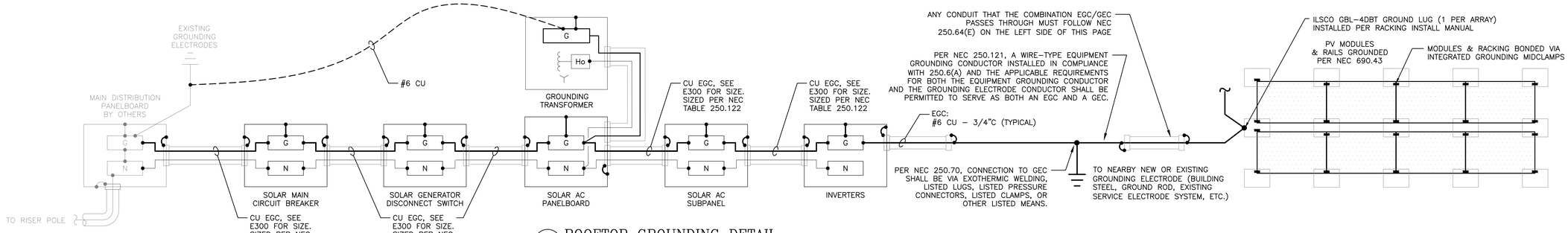
PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

DRAWING TITLE
SCHEDULES & CALCULATIONS

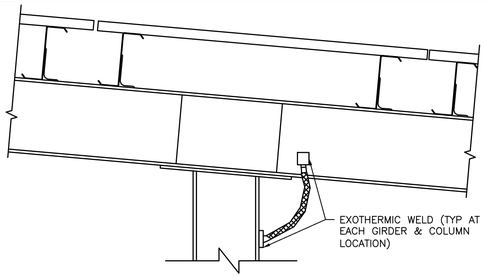
PLOT DATE: 10/22/2018 2:13 PM

NEC 250.64(E) – ENCLOSURES FOR GROUNDING ELECTRODE CONDUCTORS

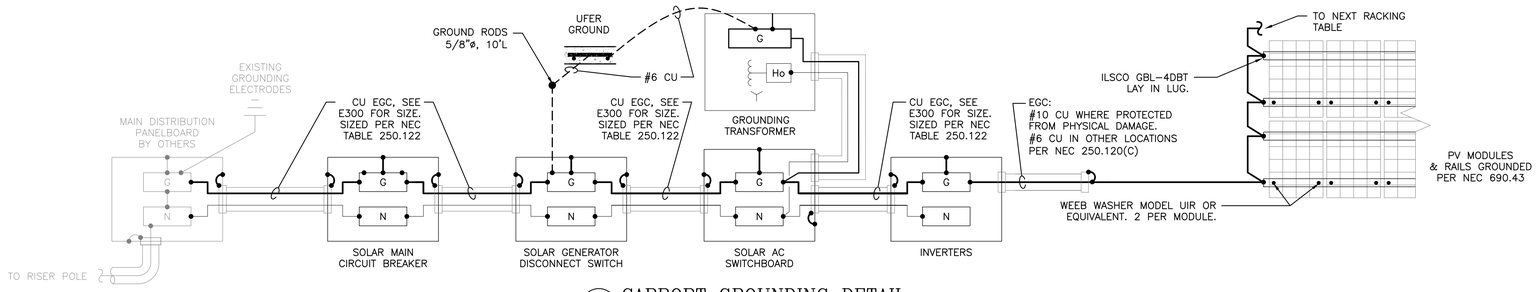
FERROUS METAL ENCLOSURES FOR GROUNDING ELECTRODE CONDUCTORS SHALL BE ELECTRICALLY CONTINUOUS FROM THE POINT OF ATTACHMENT TO CABINETS OR EQUIPMENT TO THE GROUNDING ELECTRODE AND SHALL BE SECURELY FASTENED TO THE GROUND CLAMP OR FITTING. NONFERROUS METAL ENCLOSURES SHALL NOT BE REQUIRED TO BE ELECTRICALLY CONTINUOUS. FERROUS METAL ENCLOSURES THAT ARE NOT PHYSICALLY CONTINUOUS FROM CABINETS OR EQUIPMENT TO THE GROUNDING ELECTRODE SHALL BE MADE ELECTRICALLY CONTINUOUS BY BONDING EACH END OF THE RACEWAY OR ENCLOSURE TO THE GROUNDING ELECTRODE CONDUCTOR. BONDING METHODS IN COMPLIANCE WITH 250.92(B) FOR INSTALLATIONS AT SERVICE EQUIPMENT LOCATIONS AND WITH 250.92(B)(2) THROUGH (B)(4) FOR OTHER THAN SERVICE EQUIPMENT LOCATIONS SHALL APPLY AT EACH END AND TO ALL INTERVENING FERROUS RACEWAYS, BOXES, AND ENCLOSURES BETWEEN THE CABINETS OR EQUIPMENT AND THE GROUNDING ELECTRODE. THE BONDING JUMPER FOR A GROUNDING ELECTRODE CONDUCTOR RACEWAY OR CABLE ARMOR SHALL BE THE SAME SIZE AS, OR LARGER THAN, THE ENCLOSED GROUNDING ELECTRODE CONDUCTOR. IF A RACEWAY IS USED AS PROTECTION FOR A GROUNDING ELECTRODE CONDUCTOR, THE INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS OF THE APPROPRIATE RACEWAY ARTICLE.



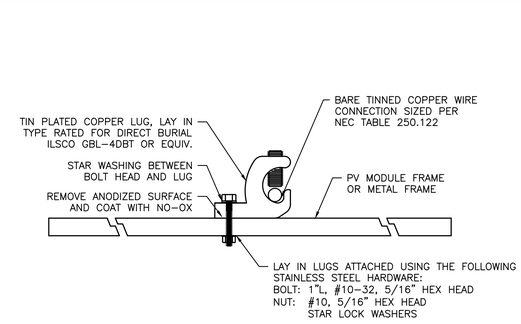
1 E401 ROOFTOP GROUNDING DETAIL
SCALE: NONE



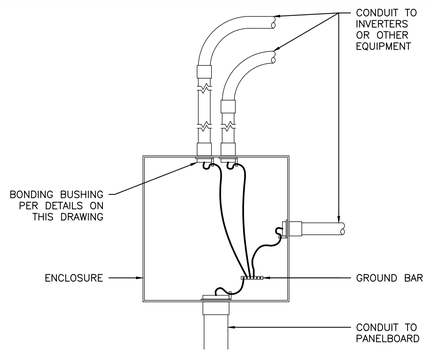
3 E401 GIRDER TO COLUMN GROUNDING
SCALE: NONE



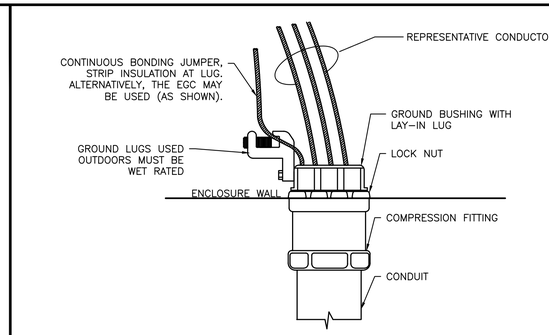
2 E401 CARPORT GROUNDING DETAIL
SCALE: NONE



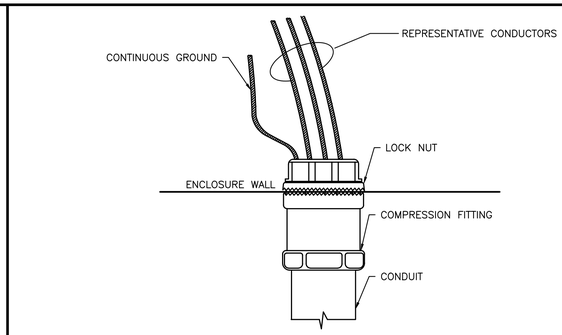
4 E401 GROUND LUG DETAIL
SCALE: NONE



5 E401 PULL BOX/TROUGH GROUNDING DETAIL
SCALE: NONE



6 E401 BONDING BUSHING GROUNDING DETAIL
SCALE: NONE



7 E401 MYER'S HUB GROUNDING DETAIL
SCALE: NONE

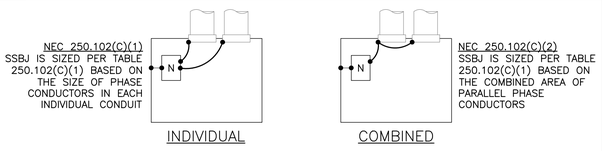


TABLE 250.102(C)(1)

SIZE OF LARGEST UNGROUNDED CONDUCTOR OR EQUIVALENT AREA FOR PARALLEL CONDUCTORS (AWG/KCMIL)		SIZE OF GROUNDED CONDUCTOR OR BONDING JUMPER (AWG/KCMIL)	
COPPER	ALUMINUM OR COPPER-CLAD ALUMINUM	COPPER	ALUMINUM OR COPPER-CLAD ALUMINUM
2 OR SMALLER	1/0 OR SMALLER	8	6
1 OR 1/0	2/0 OR 3/0	6	4
2 OR 2/0	4/0 OR 250	4	2
OVER 3/0 THROUGH 350	OVER 250 THROUGH 500	2	1/0
OVER 350 THROUGH 600	OVER 500 THROUGH 900	1/0	3/0
OVER 600 THROUGH 1100	OVER 900 THROUGH 1750	2/0	4/0
OVER 1100	OVER 1750	REFER TO NOTES IN NEC TABLE 250.102(C)(1)	

8 E401 SUPPLY SIDE BONDING JUMPERS (SSBJ)
SCALE: NONE

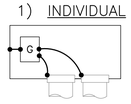
A) FOR CONCENTRIC KNOCKOUTS, USE BONDING JUMPERS AS FOLLOWS:

TABLE 250.122

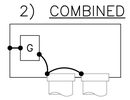
OVERCURRENT DEVICE CIRCUIT NOT EXCEEDING (AMPERES)	SIZE (AWG OR KCMIL)	
	COPPER	ALUMINUM
15	14	12
20	12	10
60	10	8
100	8	6
200	6	4
300	4	2
400	3	1
500	2	1/0
600	1	2/0
800	1/0	3/0
1000	2/0	4/0
1200	3/0	250
1600	4/0	350
2000	250	400
2500	350	600
3000	400	600
4000	500	750

FOR PARALLEL FEEDERS – NEC 250.102(D) EQUIPMENT BONDING JUMPER IS SIZED PER TABLE 250.122, REGARDLESS IF COMBINED OR INDIVIDUAL BONDING JUMPERS ARE USED

1) INDIVIDUAL



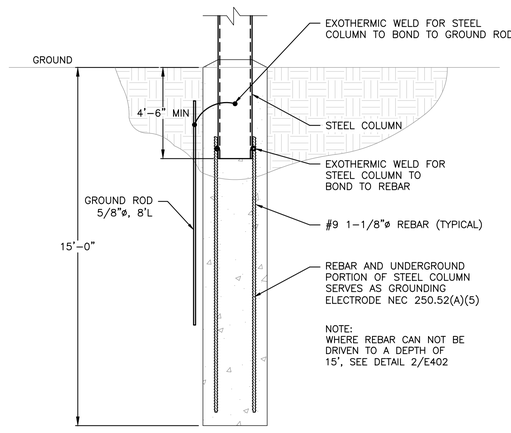
2) COMBINED



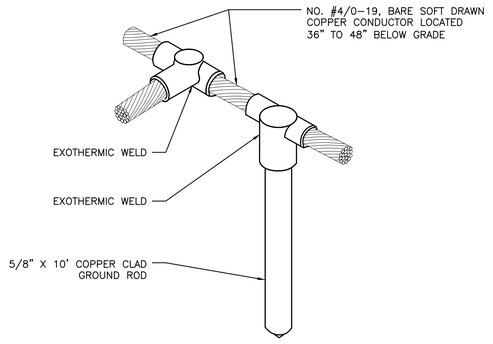
B) FOR NON–CONCENTRIC KNOCKOUTS, THE FOLLOWING METHODS SHALL BE PERMITTED (PER NEC 290.97)

1) THREADLESS COUPLINGS AND CONNECTORS FOR CABLES WITH METAL SHEATS
2) TWO LOCKNUTS, ON RIGID METAL CONDUIT OR INTERMEDIATE METAL CONDUIT, ONE INSIDE AND ONE OUTSIDE OF BOXES AND CABINETS
3) FITTINGS WITH SHOULDERS THAT SEAT FIRMLY AGAINST THE BOX OR CABINET, SUCH AS ELECTRICAL METALLIC TUBING CONNECTORS, FLEXIBLE METAL CONDUIT CONNECTORS, AND CABLE CONNECTORS, WITH ON LOCKNUT ON THE INSIDE OF BOXES AND CABINETS
4) LISTED FITTINGS (SUCH AS MEYERS HUB)

9 E401 LOAD SIDE EQUIPMENT BONDING JUMPER
SCALE: NONE



10 E401 STANDARD COLUMN GROUNDING
SCALE: NONE



11 E401 GROUND ROD DETAIL
SCALE: NONE

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

DATE	REVISION DESCRIPTION	PM	ENG CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC RI

PUREPOWER
PURE ENERGY, LLC
5 MARINE VIEW PLAZA HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. NINO
CT LICENSE No. 0623162

DEVELOPER: Safari Energy

PAGE SIZE: 36" x 24"
PROJECT #: PPE 18.087

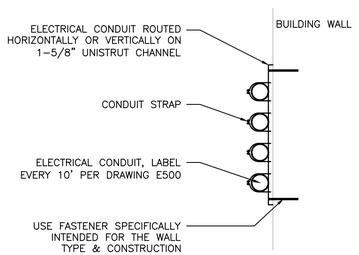
DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W–A5
MODULE QUANTITY: 6824
STRING QUANTITY: 324
ORIENTATION: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

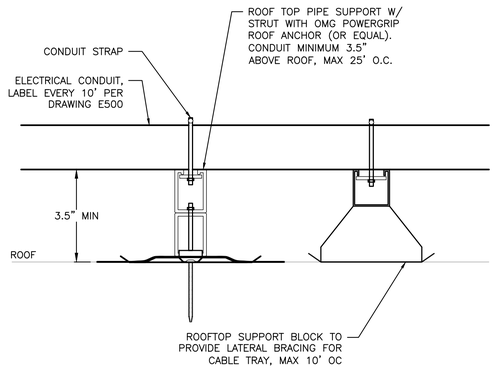
SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK 10018
WWW.SAFARIENERGY.COM

DRAWING TITLE
GROUNDING DETAILS

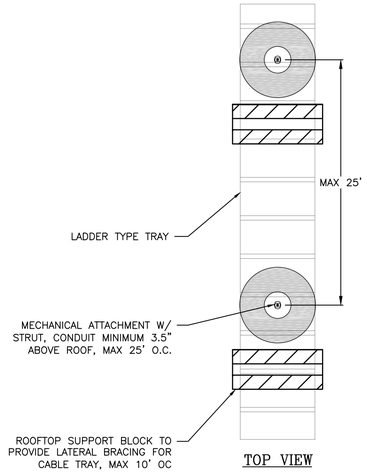
25 OF 32
DRAWING # E401

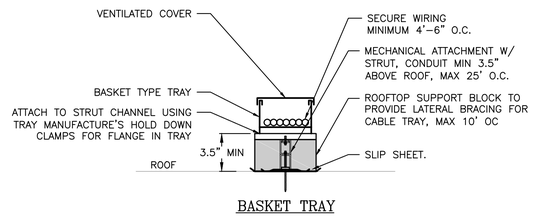


1 E402 CONDUIT WALL ANCHORING
SCALE: NONE



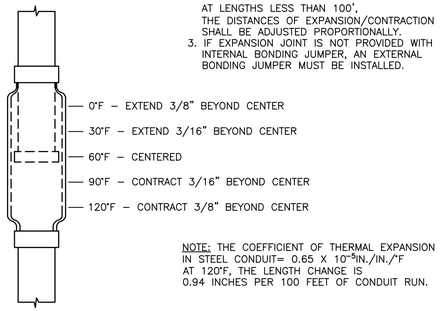
2 E402 FLAT ROOF CONDUIT SUPPORT
SCALE: NONE





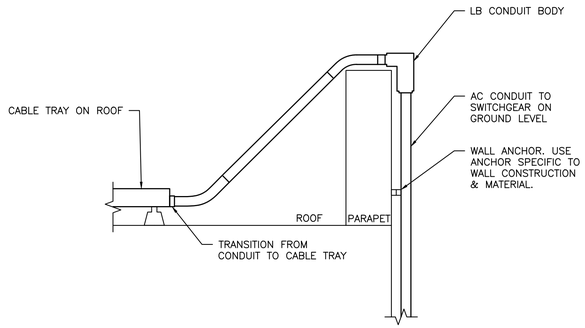
3 E402 FLAT ROOF CABLE TRAY SUPPORT
SCALE: NONE

NOTES:
1. INSTALL EXPANSION COUPLING EVERY 100' OF STRAIGHT CONDUIT RUN.
2. IF EXPANSION COUPLINGS ARE INSTALLED AT LENGTHS LESS THAN 100', THE DISTANCES OF EXPANSION/CONTRACTION SHALL BE ADJUSTED PROPORTIONALLY.
3. IF EXPANSION JOINT IS NOT PROVIDED WITH INTERNAL BONDING JUMPER, AN EXTERNAL BONDING JUMPER MUST BE INSTALLED.

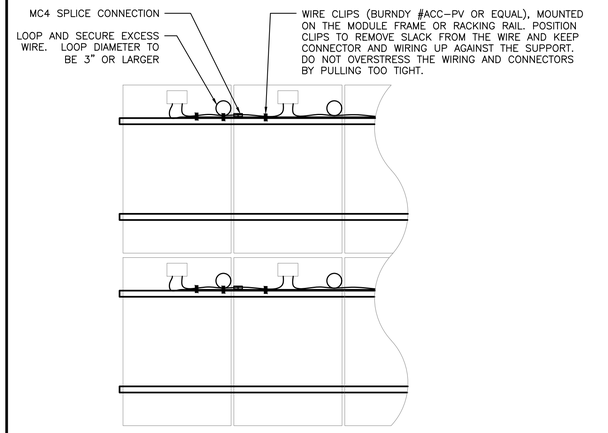


NOTE: THE COEFFICIENT OF THERMAL EXPANSION IN STEEL CONDUIT= 0.65 X 10^{-5}IN./IN./°F AT 120°F, THE LENGTH CHANGE IS 0.94 INCHES PER 100 FEET OF CONDUIT RUN.

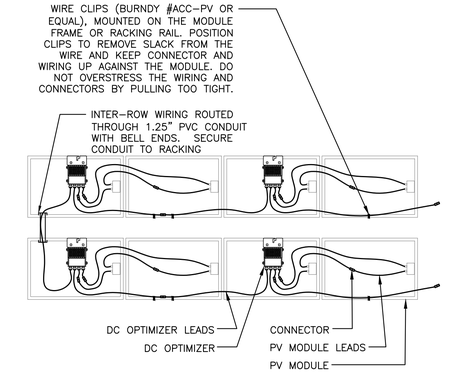
4 E402 EMT,IMC,RMC EXPANSION COUPLING DETAIL
SCALE: NONE



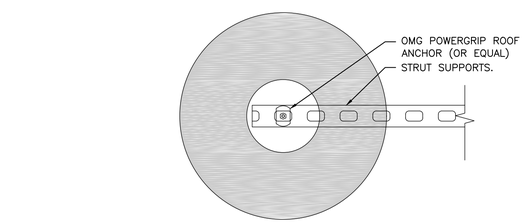
5 E402 ROOF EDGE CONDUIT RISER DETAIL
SCALE: NONE



6 E402 STRING WIRING DETAIL – CARPORT
SCALE: NONE

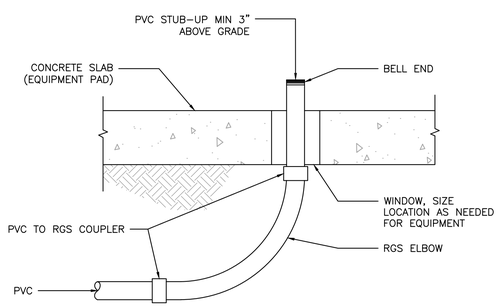


7 E402 STRING WIRING DETAIL – BALLASTED
SCALE: NONE

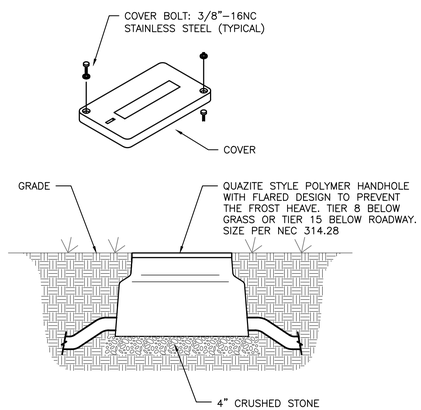


8 E402 ROOF ANCHOR ATTACHMENT DETAIL
SCALE: NONE

NOTES:
1. FOR EQUIPMENT ANCHORAGE LOCATIONS SEE STRUCTURAL DRAWINGS.
2. COORDINATE STUB-UP LOCATIONS WITH EQUIPMENT MANUFACTURER'S DRAWINGS. CONDUIT AND STUB-UP PLAN IS INTENDED TO SHOW THE GENERAL CONDUIT ROUTING AND SHALL BE ADJUSTED AS REQUIRED BY CONTRACTOR AND APPROVED SHOP DRAWINGS PROVIDED BY INSTALLING CONTRACTOR.
3. COMMUNICATION CONDUITS ARE NOT SHOWN FOR CLARITY. COORDINATE CONDUIT ROUTING AND LOCATIONS WITH EQUIPMENT PROVIDED.
4. INITIALLY INSTALL COUPLING CAP TO PREVENT DAMAGE TO STUB-UP UNTIL GEAR IS SET.
5. INSTALL ROUNDED FITTING BEFORE PULLING CABLES TO AVOID DAMAGE TO CABLES.



9 E402 EQUIPMENT PAD STUB-UP DETAIL
SCALE: NONE



10 E402 HANDHOLE DETAIL
SCALE: NONE

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

PUREPOWER
PURE ENERGY GROUP
5 MARINE VIEW PLAZA HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. NINO
CT LICENSE No. 0623462

SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK, 10018
WWW.SAFARIENERGY.COM

DEVELOPER: Safari Energy

PAGE SIZE: 36" x 24"
PROJECT #: PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 338
ORIENTATION: VARIES

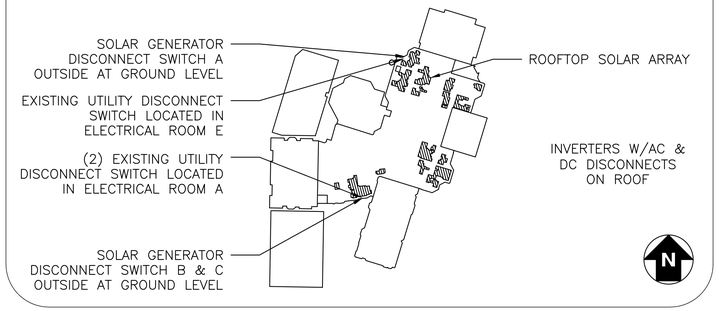
PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

DRAWING TITLE
ELECTRICAL DETAILS

26 OF 32
DRAWING # E402

NEC 705.10 & 690.56(B)

CAUTION:
POWER TO THIS SERVICE IS ALSO SUPPLIED
FROM SOLAR PV SOURCES WITH DISCONNECTS LOCATED:



2 E500 DIRECTORY LABEL
SCALE: NONE

GENERAL NOTES FOR LABELS:
1. LETTERING ON SIGNS SHALL BE CAPITAL LETTERS, MINIMUM SIZE OF 3/16" HIGH FOR GENERAL TEXT. HEADINGS SHALL BE MINIMUM 1/2" HIGH. LETTERING SHALL BE REFLECTIVE RED ON WHITE BACKGROUND OR VICE VERSA.
2. CLEARLY LABEL ALL CIRCUIT BREAKERS IN THE PANELBOARD. THE LABEL SHALL INDICATE THE NAME OF THE DEVICE IT SERVES.

⚠ WARNING
ARC FLASH AND SHOCK HAZARD
Appropriate PPE and Tools Required when working on this equipment.

OUTDOOR RATED ARC FLASH STICKER MOUNTED ON ALL EQUIPMENT

DANGER: HIGH VOLTAGE KEEP AWAY
WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL "WARNING: PHOTOVOLTAIC POWER SOURCE" SHALL BE PERMANENTLY AFFIXED ON ALL DC EXPOSED RACEWAYS, CABLE TRAYS, PULL BOXES, AND JUNCTION BOXES. LABELS SHALL BE REFLECTIVE RED BACKGROUND WITH WHITE CAPITAL LETTERS AT LEAST 3/8" TALL. LABELS SHALL BE SPACED NO GREATER THAN 10 FEET APART AND SUITABLE FOR THE ENVIRONMENT IN WHICH THEY ARE INSTALLED.

PER 2014 NEC 690.31(B)(1), PV SOURCE CIRCUITS SHALL BE IDENTIFIED AT ALL POINTS OF TERMINATION, CONNECTION, AND SPLICES.

1. STRING HOMERUNS AT ARRAY
2. DC INPUT TERMINAL OF COMBINER BOX
3. DC INPUT TERMINAL OF STRING INVERTER
(WHERE APPLICABLE)

PER 2014 NEC 690.31(B)(2), THE CONDUCTORS OF PV OUTPUT CIRCUITS AND INVERTER INPUT AND OUTPUT CIRCUITS SHALL BE IDENTIFIED AT ALL POINTS OF TERMINATION, CONNECTION, AND SPLICES.

1. DC OUTPUT TERMINALS OF COMBINER BOX
2. DC INPUT TERMINALS OF INVERTER
3. AC OUTPUT TERMINALS OF INVERTER
4. AC INPUT & OUTPUT TERMINALS OF EACH SUCCESSIVE DEVICE
(WHERE APPLICABLE)

NEC 690.54
IFC 11.12.2.2.1

SOLAR GENERATOR DISCONNECT SWITCH C

WARNING:
PHOTOVOLTAIC POWER SOURCE

OPERATING CURRENT: 1265A
NOMINAL VOLTAGE: 480V

DIRECTORY LABEL
SEE DETAIL 2/E500

ZREC METER C

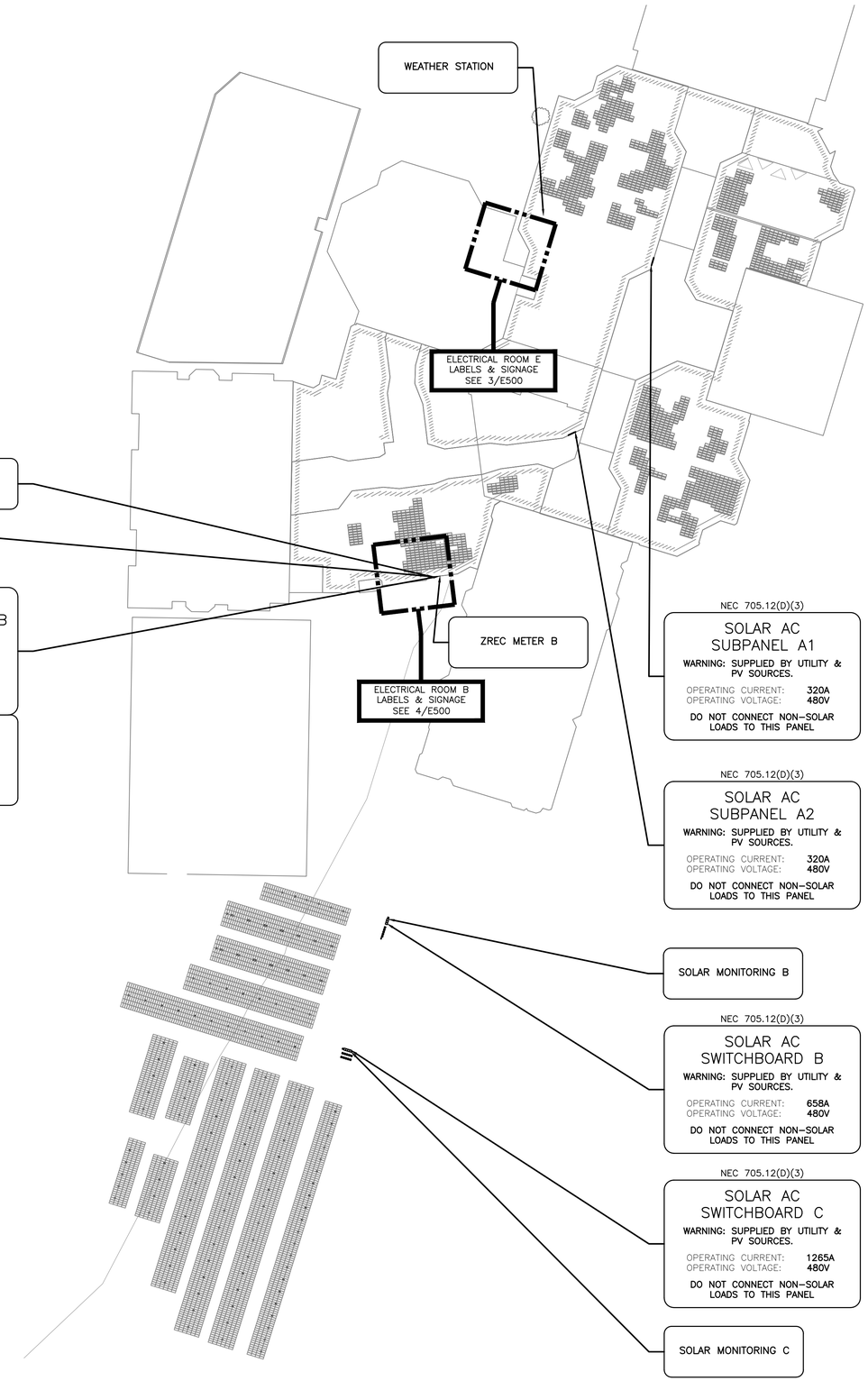
NEC 690.54
IFC 11.12.2.2.1

SOLAR GENERATOR DISCONNECT SWITCH B

WARNING:
PHOTOVOLTAIC POWER SOURCE

OPERATING CURRENT: 658A
NOMINAL VOLTAGE: 480V

DIRECTORY LABEL
SEE DETAIL 2/E500



NEC 705.12(D)(3)

SOLAR AC SUBPANEL A1

WARNING: SUPPLIED BY UTILITY & PV SOURCES.

OPERATING CURRENT: 320A
OPERATING VOLTAGE: 480V

DO NOT CONNECT NON-SOLAR LOADS TO THIS PANEL

NEC 705.12(D)(3)

SOLAR AC SUBPANEL A2

WARNING: SUPPLIED BY UTILITY & PV SOURCES.

OPERATING CURRENT: 320A
OPERATING VOLTAGE: 480V

DO NOT CONNECT NON-SOLAR LOADS TO THIS PANEL

NEC 705.12(D)(3)

SOLAR AC SWITCHBOARD B

WARNING: SUPPLIED BY UTILITY & PV SOURCES.

OPERATING CURRENT: 658A
OPERATING VOLTAGE: 480V

DO NOT CONNECT NON-SOLAR LOADS TO THIS PANEL

NEC 705.12(D)(3)

SOLAR AC SWITCHBOARD C

WARNING: SUPPLIED BY UTILITY & PV SOURCES.

OPERATING CURRENT: 1265A
OPERATING VOLTAGE: 480V

DO NOT CONNECT NON-SOLAR LOADS TO THIS PANEL

1 E500 LABELS & SIGNAGE
SCALE: 1" = 50'-0"

N

PLOT DATE: 10/22/2018 2:14 PM

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

DATE	REVISION DESCRIPTION	PM	ENG CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC RI
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PUREPOWER
PURE ENERGY
5 MARINE VIEW PLAZA HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. WINDS
CT LICENSE No. 0623162

ENGINEER'S CONNECTICUT LICENSED PROFESSIONAL ENGINEER RICHARD A. WINDS 23162 REGISTERED PROFESSIONAL ENGINEER

SAFARI ENERGY, LLC.
1407 BROADWAY, 24TH FLOOR
NEW YORK, NEW YORK, 10018
WWW.SAFARIENERGY.COM

DEVELOPER: Safari Energy

PAGE SIZE: 36" x 24"
PROJECT #: PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 339
ORIENTATION: VARIES

PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

DRAWING TITLE
LABELS & SIGNAGE

27 OF 32

DRAWING #
E500

PLOT DATE: 10/22/2018 2:14 PM

TYPICAL FOR INVERTERS:
A1–A16 (3 STRINGS)

INVERTER A1

WARNING: ELECTRIC SHOCK HAZARD

THE DC CONDUCTORS OF THIS PHOTOVOLTAIC ARRAY ARE UNGROUNDED AND MAY BE ENERGIZED

DC DISCONNECT		AC DISCONNECT	
OPERATING CURRENT:	40A	MAXIMUM AC OPERATING CURRENT:	40A
OPERATING VOLTAGE:	850V	NOMINAL AC OPERATING VOLTAGE:	480V
MAXIMUM CURRENT:	40A		
MAXIMUM VOLTAGE:	980V		

NEC 690.53, 690.35(F), 690.54

TYPICAL FOR INVERTERS:
C2–C4, C20 (8 STRINGS)

INVERTER C2

WARNING: ELECTRIC SHOCK HAZARD

THE DC CONDUCTORS OF THIS PHOTOVOLTAIC ARRAY ARE UNGROUNDED AND MAY BE ENERGIZED

DC DISCONNECT		AC DISCONNECT	
OPERATING CURRENT:	78.9A	MAXIMUM AC OPERATING CURRENT:	43.5A
OPERATING VOLTAGE:	730.8V	NOMINAL AC OPERATING VOLTAGE:	480V
MAXIMUM CURRENT:	91.6A		
MAXIMUM VOLTAGE:	887.4V		

NEC 690.53, 690.35(F), 690.54

TYPICAL FOR INVERTERS:
C5–C7, C9–C11,
C13–C15 (14 STRINGS)

INVERTER C5

WARNING: ELECTRIC SHOCK HAZARD

THE DC CONDUCTORS OF THIS PHOTOVOLTAIC ARRAY ARE UNGROUNDED AND MAY BE ENERGIZED

DC DISCONNECT		AC DISCONNECT	
OPERATING CURRENT:	138.1A	MAXIMUM AC OPERATING CURRENT:	79.4A
OPERATING VOLTAGE:	649.6V	NOMINAL AC OPERATING VOLTAGE:	480V
MAXIMUM CURRENT:	183.2A		
MAXIMUM VOLTAGE:	788.8V		

NEC 690.53, 690.35(F), 690.54

TYPICAL FOR INVERTERS:
B3, B5–B9, C1, C18, C19
(7 STRINGS)

INVERTER C1

WARNING: ELECTRIC SHOCK HAZARD

THE DC CONDUCTORS OF THIS PHOTOVOLTAIC ARRAY ARE UNGROUNDED AND MAY BE ENERGIZED

DC DISCONNECT		AC DISCONNECT	
OPERATING CURRENT:	69.0A	MAXIMUM AC OPERATING CURRENT:	43.5A
OPERATING VOLTAGE:	730.8V	NOMINAL AC OPERATING VOLTAGE:	480V
MAXIMUM CURRENT:	91.6A		
MAXIMUM VOLTAGE:	887.4V		

NEC 690.53, 690.35(F), 690.54

TYPICAL FOR INVERTERS:
B2, B10, & B11 (12 STRINGS)

INVERTER B2

WARNING: ELECTRIC SHOCK HAZARD

THE DC CONDUCTORS OF THIS PHOTOVOLTAIC ARRAY ARE UNGROUNDED AND MAY BE ENERGIZED

DC DISCONNECT		AC DISCONNECT	
OPERATING CURRENT:	118.3A	MAXIMUM AC OPERATING CURRENT:	79.4A
OPERATING VOLTAGE:	730.8V	NOMINAL AC OPERATING VOLTAGE:	480V
MAXIMUM CURRENT:	157.1A		
MAXIMUM VOLTAGE:	887.4V		

NEC 690.53, 690.35(F), 690.54

TYPICAL FOR INVERTERS:
C12 (6 STRINGS)

INVERTER B5

WARNING: ELECTRIC SHOCK HAZARD

THE DC CONDUCTORS OF THIS PHOTOVOLTAIC ARRAY ARE UNGROUNDED AND MAY BE ENERGIZED

DC DISCONNECT		AC DISCONNECT	
OPERATING CURRENT:	59.1A	MAXIMUM AC OPERATING CURRENT:	43.5A
OPERATING VOLTAGE:	649.6V	NOMINAL AC OPERATING VOLTAGE:	480V
MAXIMUM CURRENT:	78.5A		
MAXIMUM VOLTAGE:	788.8V		

NEC 690.53, 690.35(F), 690.54

TYPICAL FOR INVERTERS:
B1, B10, C10, & C17
(10 STRINGS)

INVERTER B5

WARNING: ELECTRIC SHOCK HAZARD

THE DC CONDUCTORS OF THIS PHOTOVOLTAIC ARRAY ARE UNGROUNDED AND MAY BE ENERGIZED

DC DISCONNECT		AC DISCONNECT	
OPERATING CURRENT:	98.6A	MAXIMUM AC OPERATING CURRENT:	79.4A
OPERATING VOLTAGE:	730.8V	NOMINAL AC OPERATING VOLTAGE:	480V
MAXIMUM CURRENT:	130.9A		
MAXIMUM VOLTAGE:	887.4V		

NEC 690.53, 690.35(F), 690.54

1 E501 INVERTER LABELS
SCALE: NONE

NEC 690.54, 705.12(D)(2)(3)(b)
IFC 11.12.2.2.1

SOLAR MAIN
CIRCUIT BREAKER C
SOUTH CARPORT SYSTEM C

WARNING:
PHOTOVOLTAIC POWER SOURCE. DO NOT RELOCATE THIS OVERCURRENT DEVICE

OPERATING CURRENT: 1265A
NOMINAL VOLTAGE: 480V

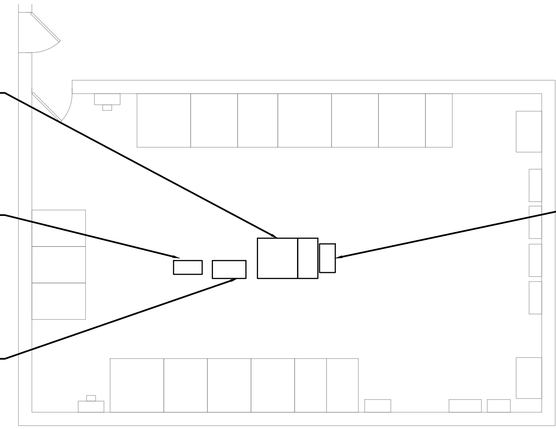
RELAY BOX B

NEC 690.54, 705.12(D)(2)(3)(b)
IFC 11.12.2.2.1

SOLAR MAIN
CIRCUIT BREAKER B
NORTH CARPORT SYSTEM B

WARNING:
PHOTOVOLTAIC POWER SOURCE. DO NOT RELOCATE THIS OVERCURRENT DEVICE

OPERATING CURRENT: 658A
NOMINAL VOLTAGE: 480V



3 E501 ELECTRICAL ROOM – LABELS & SIGNAGE
SCALE: 3/8" = 1'-0"

RELAY BOX A

SOLAR MONITORING A

DIRECTORY LABEL
SEE DETAIL 2/E500

ZREC METER A

NEC 690.54, 705.12(D)(2)(3)(b)
IFC 11.12.2.2.1

SOLAR MAIN
CIRCUIT BREAKER A
ROOFTOP SOLAR SYSTEM A

WARNING:
PHOTOVOLTAIC POWER SOURCE. DO NOT RELOCATE THIS OVERCURRENT DEVICE

OPERATING CURRENT: 640A
NOMINAL VOLTAGE: 480V

NEC 690.54
IFC 11.12.2.2.1

SOLAR GENERATOR
DISCONNECT SWITCH A
ROOFTOP SOLAR SYSTEM A

WARNING:
PHOTOVOLTAIC POWER SOURCE

OPERATING CURRENT: 640A
NOMINAL VOLTAGE: 480V

NEC 705.12(D)(3)

SOLAR AC
PANELBOARD A

WARNING: SUPPLIED BY UTILITY & PV SOURCES.

OPERATING CURRENT: 640A
OPERATING VOLTAGE: 480V

DO NOT CONNECT NON-SOLAR LOADS TO THIS PANEL

DIRECTORY LABEL
SEE DETAIL 2/E500

PV RAPID SHUTDOWN
PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TO START RAPID SHUTDOWN, TURN SWITCH TO OFF POSITION.

WHEN RAPID SHUTDOWN IS INITIATED, EMERGENCY RESPONDERS MAY MOVE AROUND THE ROOF UNDERSTANDING PV SYSTEM CONDUCTORS:

1. LESS THAN 10' FROM AN ARRAY MAY BE ENERGIZED – DO NOT TOUCH!

2. MORE THAN 10' FROM AN ARRAY ARE NOT ENERGIZED AND ARE SAFE TO CONTACT (IF NECESSARY)

NEC 690.12 & 690.56(C)

4 E501 ELECTRICAL ROOM – LABELS & SIGNAGE
SCALE: 3/8" = 1'-0"

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08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

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CT LICENSE No. 0093862

ENGINEER OF RECORD
RICHARD A. WINDS
CONNECTICUT
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PROFESSIONAL ENGINEER

DEVELOPER
Safari Energy

SAFARI ENERGY, LLC.
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NEW YORK, NEW YORK 10018
WWW.SAFARIENERGY.COM

PROJECT
2729.60kW SOLAR SYSTEM AT
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PAGE SIZE: 36" x 24"
PROJECT #: PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 329
ORIENTATION: VARIES

DRAWING TITLE
LABELS & SIGNAGE

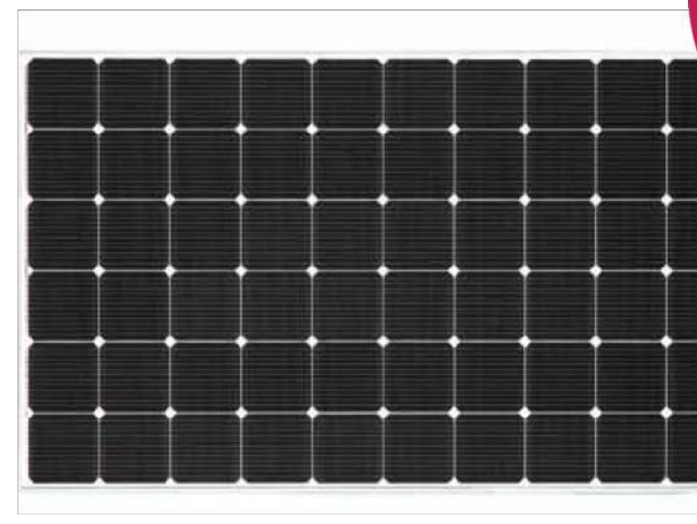
28 OF 32

DRAWING #
E501

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

LG Life's Good

Innovation for a Better Life



LG NeON™ 2 72cell LG410N2W-A5 LG405N2W-A5 LG400N2W-A5 LG395N2W-A5

72 cell

LG's new module, LG NeON™ 2, adopts Cello technology. Cello technology replaces 3 busbars with 12 thin wires to enhance power output and reliability. LG NeON™ 2 demonstrates LG's efforts to increase customer's value beyond efficiency. It features enhanced warranty, durability, performance under real environment, and aesthetic design suitable for roofs.

Intertek CE APPROVED PRODUCT

Enhanced Performance Warranty
LG NeON™ 2 has an enhanced performance warranty. The annual degradation has fallen from -0.6%/yr to -0.55%/yr. Even after 25 years, the cell guarantees 1.2%p more output than the previous LG NeON™ 2 modules.

High Power Output
Compared with previous models, the LG NeON™ 2 has been designed to significantly enhance its output efficiency, thereby making it efficient even in limited space.

Aesthetic Roof
LG NeON™ 2 has been designed with aesthetics in mind; thinner wires that appear all black at a distance. The product may help increase the value of a property with its modern design.

Outstanding Durability
With its newly reinforced frame design, LG has extended the warranty of the LG NeON™ 2 for an additional 2 years. Additionally, LG NeON™ 2 can endure a front load up to 5400 Pa, and a rear load up to 4300 Pa.

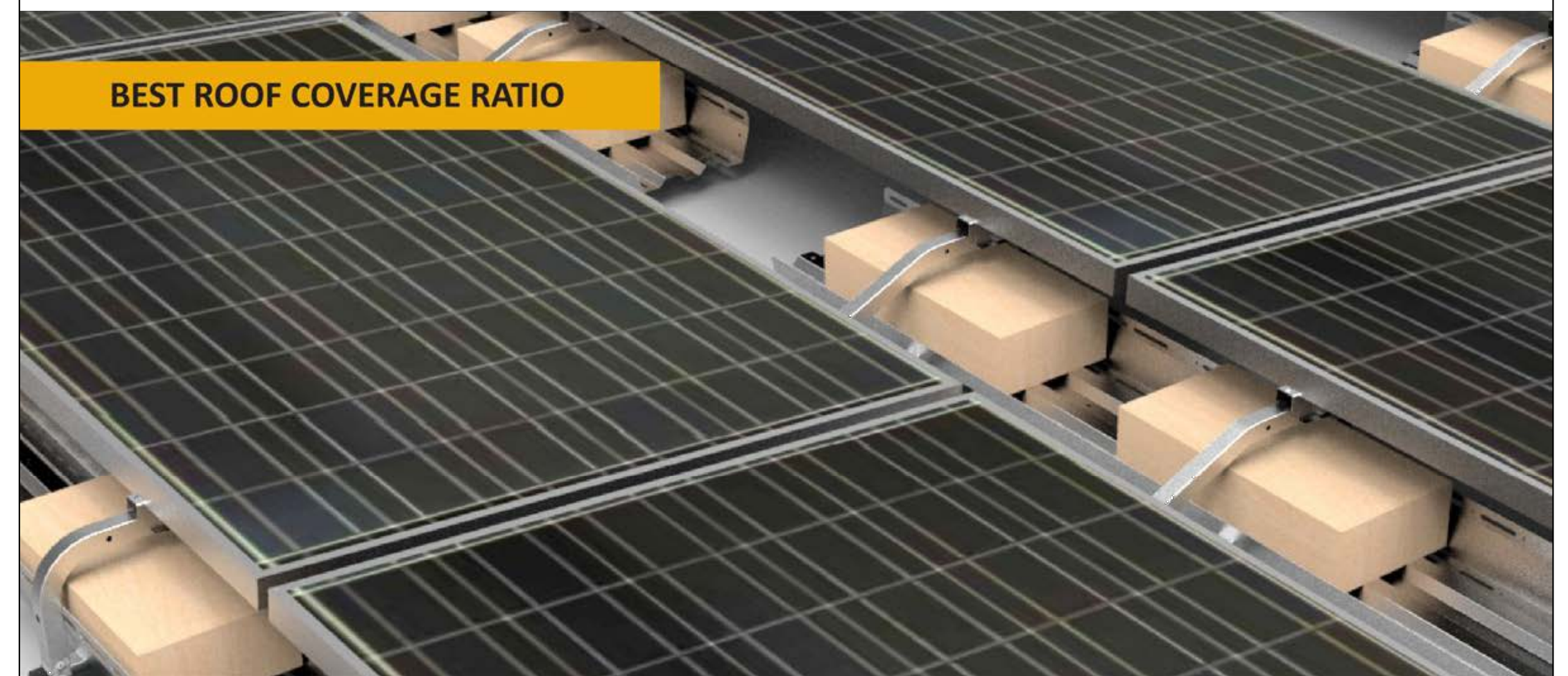
Better Performance on a Sunny Day
LG NeON™ 2 now performs better on sunny days thanks to its improved temperature coefficiency.

Double-Sided Cell Structure
The rear of the cell used in LG NeON™ 2 will contribute to generation, just like the front; the light beam reflected from the rear of the module is reabsorbed to generate a great amount of additional power.

About LG Electronics

LG Electronics is a global player who has been committed to expanding its operations with the solar market. The company first embarked on a solar energy source research programs in 1985, supported by LG Group's vast experience in the semi-conductor, LCD, chemistry, and materials industries. In 2010, LG Solar successfully released its first Mono X® series to the market, which is now available in 32 countries. The LG NeON™ (previously known as Mono X® NeON) and the LG NeON™2 won the "Intersolar Award" in 2013 and 2015, which demonstrates LG Solar's lead, innovations and commitment to the industry.

Polar Bear III HD
5 Degree Flat Roof Mounting System

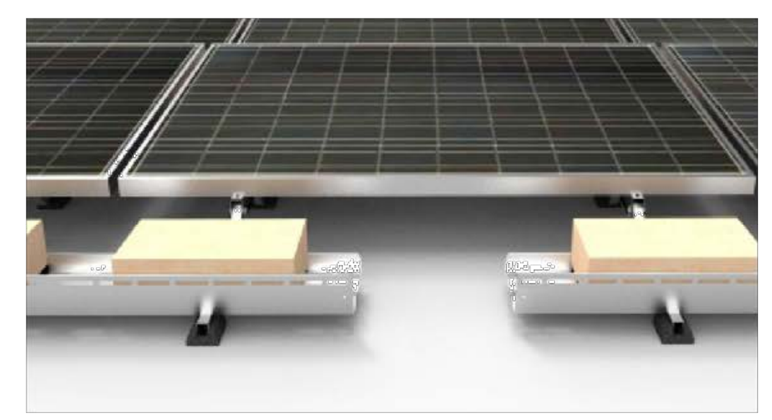


BEST ROOF COVERAGE RATIO

A racking design that helps you maximize power density

Polar Bear® III HD 5D offers two row-spacing options to optimize designs and maximize power density. Polar Bear III HD draws on seven years of industry experience. It provides more design flexibility, improved constructability, universal framed module support, enhanced roof protection, better wire management, and a lower cost than Polar Bear III or any other reliable flat roof mounting solution in the market today. Combined with PanelClaw's support team of flat roof experts, Polar Bear III HD is the obvious choice for your commercial flat roof projects.

With over 6,000 flat roof projects completed around the world including more than 2,000 jurisdictions in 45 states in the US, we are your flat roof partners. Experience the PanelClaw® Advantage on your next flat roof project.



panelclaw.com

panel claw®

Locus ENERGY A GENSCAPE COMPANY

PERFORMANCE DATA ACQUISITION FOR COMMERCIAL PV SYSTEMS
LGate 360

Locus Energy's LGate 360 is a performance data acquisition kit for commercial solar photovoltaic systems. Designed to integrate easily into three-phase PV systems of all sizes, the LGate continually collects a multitude of energy and environmental data allowing site owners and operators to efficiently manage solar assets.

The LGate 360 can be configured to monitor nearly any type of PV system. The standard configuration consists of an industrial grade datalogger and revenue-grade energy meter mounted inside a weatherized enclosure. All LGates are shipped with integrated disconnect breakers making field installation much simpler. In addition, each unit can be configured to aggregate data from a large variety of peripheral devices such as inverters, string/sub-array combiner boxes and weather stations.

DATA COLLECTION
The LGate uses the RS-485 Modbus protocol to communicate with downstream devices. Any device that supports Modbus can be connected and monitored by the LGate. Up to 32 devices can be connected through the Modbus loop. All data is collected, timestamped and then stored in non-volatile memory. This interval data is stored locally until the next scheduled upload.

CONNECTIVITY
Once the LGate collects and stores performance data from connected devices, it will upload batches of data at regular intervals to Locus Energy's SolarNOC™ web application. The LGate can transmit data over Ethernet or cellular networks. The integrated datalogger can be set to communicate through almost any type of local area network.

▸ Learn more about the LGate 360 at www.locusenergy.com

LG NeON™ 2 72cell LG410N2W-A5 LG405N2W-A5 LG400N2W-A5 LG395N2W-A5

Mechanical Properties

Cells	6 x 12
Cell Vendor	LG
Cell Type	Monocrystalline / N-type
Cell Dimensions	161.7 x 161.7 mm / 6 inches
# of Busbar	12 (Multi Wire Busbar)
Dimensions (L x W x H)	2024 x 1024 x 40 mm 79.69 x 40.31 x 1.57 inch
Front Load	5400Pa
Rear Load	4300Pa
Weight	21.7 kg
Connector Type	MC4
Junction Box	IP68 with 3 Bypass Diodes
Cables	1200 mm x 2 ea
Glass	High Transmission Tempered Glass
Frame	Anodized Aluminium

Certifications and Warranty

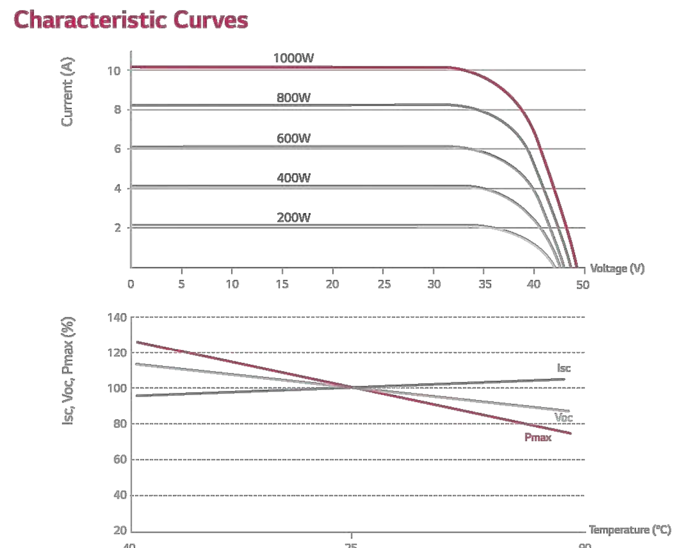
Certifications	IEC 61215, IEC 61730-1/-2 UL 1703 IEC 61701 (Salt mist corrosion test) IEC 62716 (Ammonia corrosion test) ISO 9001
Module Fire Performance (USA)	Type 1
Fire Rating (CANADA)	Class C (ULC / ORD C1703)
Product Warranty	12 years
Output Warranty of Pmax	Linear warranty**

** 1) 1st year : 98%, 2) After 2nd year : 0.55% annual degradation, 3) 25 years : 84.8%

Temperature Characteristics

NOCT	45 ± 3 °C
Pmpp	-0.36%/°C
Voc	-0.26%/°C
Isc	0.02 %/°C

Characteristic Curves



Electrical Properties (STC *)

Module	410W	405W	400W	395W
Maximum Power (Pmax)	410	405	400	395
MPP Voltage (Vmpp)	41.4	41.0	40.6	40.2
MPP Current (Impp)	9.91	9.89	9.86	9.83
Open Circuit Voltage (Voc)	49.5	49.4	49.3	49.2
Short Circuit Current (Isc)	10.55	10.51	10.47	10.43
Module Efficiency	19.8	19.5	19.3	19.1
Operating Temperature	-40 ~ +90			
Maximum System Voltage	1500 (UL)			
Maximum Series Fuse Rating	20			
Power Tolerance (%)	0 ~ +3			

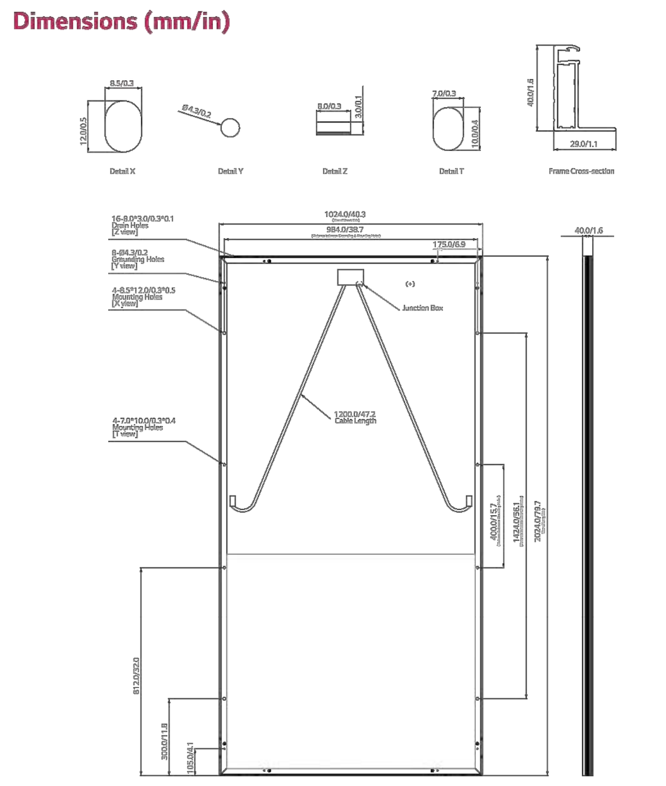
* STC (Standard Test Condition): Irradiance 1,000 W/m², Ambient Temperature 25 °C, AM 1.5
* The nameplate power output is measured and determined by LG Electronics at its sole and absolute discretion.
* The Typical change in module efficiency at 200W/m² in relation to 1000W/m² is -2.0%.

Electrical Properties (NOCT*)

Module	410W	405W	400W	395W
Maximum Power (Pmax)	304	300	296	293
MPP Voltage (Vmpp)	38.3	38.0	37.6	37.2
MPP Current (Impp)	7.92	7.91	7.88	7.86
Open Circuit Voltage (Voc)	46.3	46.2	46.1	46.0
Short Circuit Current (Isc)	8.47	8.44	8.41	8.38

* NOCT (Nominal Operating Cell Temperature): Irradiance 800W/m², ambient temperature 20 °C, wind speed 1m/s

Dimensions (mm/in)



LG Life's Good
North America Solar Business Team
LG Electronics U.S.A. Inc
1000 Sylvan Ave, Englewood Cliffs, NJ 07632
Contact: lg.solar@lge.com
www.lgsolarusa.com

Product specifications are subject to change without notice.

Innovation for a Better Life

Polar Bear III HD
5 Degree Flat Roof Mounting System

panel claw®

BEST ROOF COVERAGE RATIO

46" Module to Module Spacing

49" Module to Module Spacing

Best Power Density
Polar Bear® III 5D offers the best roof coverage ratio on the market. The tight-row spacing option allows for maximum roof capacity while the single module tilt up and walkway path facilitate system maintenance.

Trusted Roof Integrity
Polar Bear® III HD protects the roof with fully captured ballast, integrated recycled rubber roof protection pads and a system design that allows for free water flow.

Safety and Reliability
PanelClaw's industry-leading reliability track record in the flat roof space is the result of our investment in an extensive test program that goes beyond existing codes and standards. We maintain long term partnerships with third party test laboratories and codes and standards bodies throughout the industry.

Three Components

Support
- Easy-to-handle components that weigh less than 2.5 pounds
- Integrated recycled rubber roof protection pads
- Pre-drilled holes for wire management cabling options

Ballast Tray
- Locking end-tab to fully capture ballast blocks
- Adjustable mounting location to fit all major module brands
- Nested design to provide high packaging density

Claw
- Attachment to module using standard module mounting holes
- UL 2703 certified for electrical bonding and grounding
- Two energy density mounting options
- Pre-drilled for E/W module-to-module wire management

Applications
Flat roof (max slope 5°)
Fully ballasted or mechanically attached

Module Tilt Angle
5° nominal

North/South Module to Module Repeat
46" or 49"

Platform Load
~2.4 psf to 10.0 psf

Module Orientation
Landscape

Module Attachment
Standard module mounting holes

Basic Wind Speed
Up to 150 mph (>150 mph by approval)

Wind Exposure Category
B and C (D by approval)

Seismic Compatibility
C, D, E and F

Material
G90 steel with stainless steel fasteners

Warranty
25 year warranty

Listings and Certifications
ANSI/UL 2703-2015 listed
UL 2703 System Fire Rating: Class A with Type 1 and Type 2 modules

(978) 688.4900 | sales@panelclaw.com

LGATE 360 SPECS | WWW.LOCUSENERGY.COM

COMPONENTS

Datalogger	AcquiSuite EMB A8810
Meter	Veris Industries E50 Series Meter
DC Power	Schneider Electric ABL8RP
Cell Modem	Digi Transport WR21
External Battery Backup	24 Hours
Data Storage Interval	15 Mins (1, 5 optional)
Remote Upgrades	Yes

COMMUNICATION

LAN	RJ45 10/100 Ethernet, full half duplex, auto polarity
Cellular (optional)	GSM/CDMA
Networking	DHCP or Static IP
Modbus TCP	100 Clients per Logger
Modbus RTU	32 Clients per Logger

COMPLIANCE

ANSI C12.20 Class 0.5 (Power Meter)
CAN/CSA-C22.2 No. 14 listed Industrial Control Panel
UL Listed 508A listed Industrial Control Panel

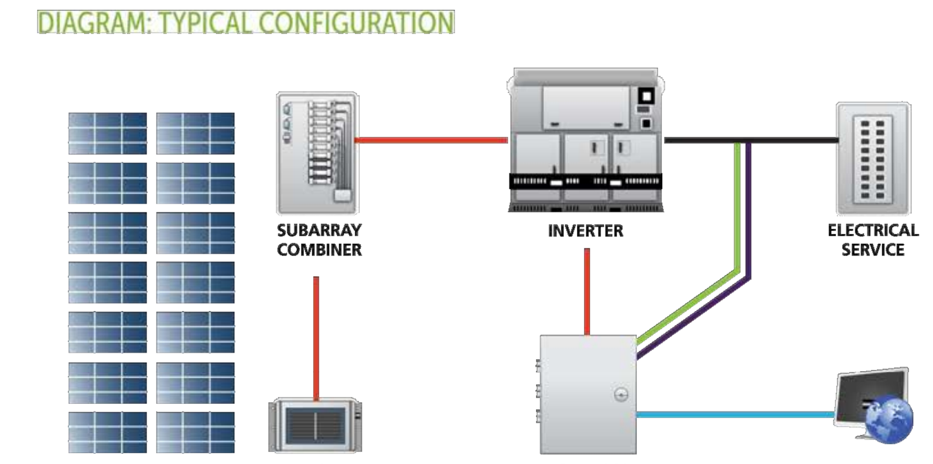
PHYSICAL

Enclosure Rating	NEMA 4
Weight	30 lbs+
Dimensions	20" L x 16" W x 8" H
Environment	-30 C to 70 C, 95% RH, non-condensing

POWER METER

Voltage Inputs	277/480V, 120/208V
Phases	Single phase, Split phase, Three phase at 50 or 60 Hz
Current Inputs	mV full scale output CTs

DIAGRAM: TYPICAL CONFIGURATION



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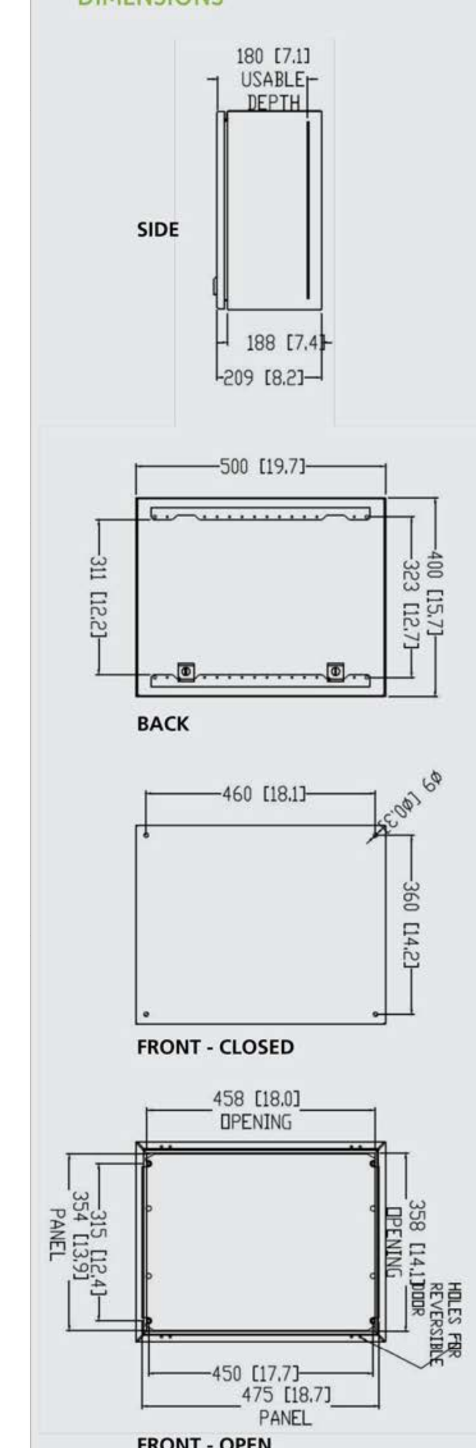
DIMENSIONS



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ENGINEER: PUREPOWER ENGINEERING, 5 MARINE VIEW PLAZA HOBOKEN, NJ, WWW.PUREPOWER.COM, RICHARD A. IVINS, CT LICENSE No. 0029262

STATE OF CONNECTICUT, RICHARD A. IVINS, PEN.0029262, LICENSED PROFESSIONAL ENGINEER

DEVELOPER: Safari Energy — SAFARI ENERGY, LLC. 1407 BROADWAY, 24TH FLOOR NEW YORK, NEW YORK 10018 WWW.SAFARIENERGY.COM

PAGE SIZE 36" x 24"
PROJECT # PPE 18.087

DC SYSTEM SIZE: 2729.60 kW
AC SYSTEM SIZE: 2032.80 kW
MODULE: LG400N2W-A5
MODULE QUANTITY: 6824
STRING QUANTITY: 329
ORIENTATION: VARIES

PROJECT: 2729.60KW SOLAR SYSTEM AT TAUBMAN WESTFARMS MALL, 1500 NEW BRITAIN AVENUE, WEST HARTFORD, CT 06110

DRAWING TITLE: EQUIPMENT DATA SHEETS

DRAWING # E600

RULER IN INCHES:

PLOT DATE: 10/22/2018 2:14 PM

RULER IN INCHES:

YASKAWA

PVI 23TL, PVI 28TL & PVI 36TL

3-Ph Transformerless Commercial String Inverters

Features
- 1000 VDC
- Best in class efficiency
- Touch-safe fuses
- Dual & wide MPP tracking zones
- Modbus communications
- Integrated DC fused string combiner
- DC arc-fault protection
- PVI 36TL - UL 1741SA listed

Options
- Web-based monitoring
- Shade cover
- DC/AC disconnect covers
- Roof mount array brackets
- DC combiners bypass

Yaskawa Solectria Solar's PVI 23TL, PVI 28TL, and PVI 36TL are compact, transformerless three-phase inverters with a dual MPP tracker. These inverters come standard with AC and DC disconnects, user-interactive LCD, and an integrated fused string combiner. Its small, lightweight design makes for quick and easy installation and maintenance. These inverters include an enhanced DSP control, comprehensive protection functions, and advanced thermal design enabling highest reliability and uptime. They also come with a standard 10 year warranty with options for 15 and 20 years. Options include web-based monitoring, shade cover, DC/AC disconnect covers, DC combiners bypass, and roof mount array bracket.

SOLECTRIA SOLAR

YASKAWA

PVI 50TL & PVI 60TL

3-Ph Transformerless Commercial String Inverters

Features
- Integrated arc fault protection
- Compliant with UL 1741SA
- 3 MPPTs with 5 inputs each
- Integrated DC and AC disconnects
- AC terminals compatible with copper and aluminum conductors
- Modbus communications
- Internal data logger
- 0 - 90° installation orientation
- Remote firmware upgrades
- Remote diagnostics

Options
- H4 wiring box
- Shade cover
- DC combiners bypass
- Web-based monitoring

Yaskawa Solectria Solar's PVI 50TL and PVI 60TL are grid-tied, transformerless three-phase inverters designed for ground mount, rooftop and carport arrays and can be installed from 0 - 90 degrees. The PVI 50/60TL inverters are the most reliable, efficient and cost effective in their class. They come standard with AC and DC disconnects, three MPPTs, a 15-position string combiner, remote diagnostics, remote firmware upgrades and various protection features. Options include H4 wiring box, shade cover, DC combiner fuse bypass, and web-based monitoring.

SOLECTRIA SOLAR

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SolarEdge Three Phase Inverters for the 277/480V Grid for North America

SE10KUS / SE20KUS / SE30KUS / SE33.3KUS

INVERTERS

The best choice for SolarEdge enabled systems
- Specifically designed to work with power optimizers
- Superior efficiency (98.5%)
- Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- UL1741 SA certified, for CPUC Rule 21 grid compliance
- Built-in module-level monitoring
- Internet connection through Ethernet or Wireless
- Small, lightweight, and easy to install outdoors or indoors on provided bracket
- Fixed voltage inverter for longer strings
- Integrated Safety Switch
- Supplied with RS485 Surge Protection Device, to better withstand lightning events

USA-CANADA-GERMANY-UK-ITALY-THE NETHERLANDS-JAPAN-CHINA-AUSTRALIA-ISRAEL-FRANCE-BELGIUM-TURKEY-INDIA-BULGARIA-ROMANIA-HUNGARY-SWEDEN-SOUTH AFRICA-POLAND-CZECH REPUBLIC

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Power Optimizer for North America

P730 / P800p / P850

POWER OPTIMIZER

PV power optimization at the module-level
The most cost effective solution for commercial and large field installations
- Specifically designed to work with SolarEdge inverters
- Up to 25% more energy
- Superior efficiency (99.5%)
- Balance of System cost reduction; 50% less cables, fuses and combiner boxes, over 2x longer string lengths possible
- Fast installation with a single bolt
- Advanced maintenance with module-level monitoring
- Module-level shutdown for installer and firefighter safety
- Compliant with arc fault protection and rapid shutdown NEC requirements (when installed as part of the SolarEdge system)
- Use with two PV modules connected in series or in parallel

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PVI 23/28/36TL

Specifications

	PVI 23TL	PVI 28TL	PVI 36TL
DC Input			
Absolute Maximum Input Voltage	1000 VDC	1000 VDC	1000 VDC
Maximum Power Input Voltage Range (MPPT)	480-800 VDC	500-800 VDC	540-800 VDC
Operating Voltage Range (MPPT)	240-950 VDC	240-950 VDC	240-950 VDC
MPP Trackers	2 with 4-fused inputs per tracker	2 with 4-fused inputs per tracker	2 with 5-fused inputs per tracker
Maximum Operating Input Current	25 A per MPPT (50 A)	29 A per MPPT (58 A)	35 A per MPPT (70 A)
Maximum Available PV Current (Isc x 1.25)	41 A per MPPT (82 A)	48 A per MPPT (96 A)	62.5 A per MPPT (125 A)
Maximum PV Power (per MPPT)	15.5 kW	19 kW	27 kW
Strike Voltage	330 V	330 V	330 V
AC Output			
Nominal Output Voltage	480 VAC, 3-Ph	480 VAC, 3-Ph	480 VAC, 3-Ph
AC Voltage Range	-12/+10%	-12/+10%	-12/+10%
Continuous Output Power	23 kW	28 kW	36 kW
Maximum Output Current	27.7 A	33.7 A	43.5 A
Maximum Backfeed Current	0 A	0 A	0 A
Nominal Output Frequency	60 Hz	60 Hz	60 Hz
Output Frequency Range	59.3-60.5 Hz (adjustable 55-65 Hz)	59.3-60.5 Hz (adjustable 55-65 Hz)	57-63 Hz
Power Factor	Unity, >0.99 (±0.8 adjustable)	Unity, >0.99 (±0.8 adjustable)	Unity, >0.99 (±0.8 adjustable)
Total Harmonic Distortion (THD) @ Rated Load	<3%	<3%	<3%
Grid Connection Type	3-Ph + N/GND (4-wire)	3-Ph + N/GND (4-wire)	3-Ph + N/GND (4-wire)
Efficiency			
Peak Efficiency	98.6%	98.6%	98.5%
CEC Efficiency	98.0%	98.0%	98.0%
Tare Loss	2 W	2 W	2 W
Integrated String Combiner			
Fused Positions	8 fused positions (4 positions per MPPT) 15 A (fuse by-pass available)		10 fused positions (5 positions per MPPT) 15 or 30 A (30 A only for combined inputs)
Temperature			
Ambient Temperature Range	-22°F to +140°F (-30°C to +60°C); Derating occurs over +45°C		
Storage Temperature Range	No low temp minimum to +158°F (+70°C)		
Relative Humidity (non-condensing)	0-95%		
Operating Altitude	13,123 ft (4,000 m); Derating occurs from 6,562 ft (2,000 m)		
Data Monitoring			
SolrenView Web-Based Monitoring	Optional, External		
Revenue Grade Monitoring	Optional, External		
External Communication Interface	RS-485 Modbus RTU		
Testing & Certifications			
Safety Listings & Certifications	UL 1741 / IEEE 1547, CSA C22.2#107.1, FCC part 15 B		
Advanced Grid Support Functionality	-		UL 1741SA
Testing Agency	CSA		
Warranty			
Standard and Options	10 Years Standard; Options for 15 and 20 Years		
Enclosure			
dBA (Decibel) Rating	< 50 dBA @ 3 m		
DC Disconnect	Standard, fully-integrated		
Mounting Angle/Installation Angle	15° to 90° measured from horizontal		
Dimensions (H x W x D)	39.4 in. x 23.6 in. x 9.1 in. (1001 x 600 x 232 mm)		
Weight	104 lbs (47.2 kg)		121 lbs (55 kg)
Enclosure Rating	Type 4		Type 4X
Enclosure Finish	Polyester Powder Coated Aluminum		

SOLECTRIA SOLAR

YASKAWA

PVI 50TL & PVI 60TL

Specifications

	PVI 50TL	PVI 60TL
DC Input		
Absolute Maximum Input Voltage	1000 VDC	1000 VDC
Maximum Power Input Voltage Range (MPPT)	480-850 VDC	540-850 VDC
Operating Voltage Range (MPPT)	200-950 VDC	200-950 VDC
Maximum Operating Input Current	108 A (36 A per MPPT)	114 A (38 A per MPPT)
Number of MPP Trackers	3	3
Maximum Available PV Current (Isc x 1.25)	204 A (68 A per MPPT)	204 A (68 A per MPPT)
Maximum PV Power	75 kW (30 kW per MPPT)	90 kW (33 kW per MPPT)
Start Voltage	330 V	330 V
AC Output		
Nominal Output Voltage	480 VAC, 3-Ph/PE/N	480 VAC, 3-Ph/PE/N
AC Voltage Range (Standard)	-12/+10%	-12/+10%
Continuous Output Power	50 kW	60 kW
Maximum AC Apparent Power	55 kVA	66 kVA
Maximum Output Current	66.2 A	79.4 A
Nominal Output Frequency	60 Hz	60 Hz
Output Frequency Range	57-63 Hz	57-63 Hz
Power Factor	Unity, >0.99 (Adjustable 0.8 leading to 0.8 lagging)	Unity, >0.99 (Adjustable 0.8 leading to 0.8 lagging)
Fault Current Contribution (1 Cycle RMS)	55 A	55 A
Total Harmonic Distortion (THD) @ Rated Load	<3%	<3%
Recommended OCPD Device	90 A	100 A
AC Surge Protection	Type II MOV, 1240Vc, 15kA Itm (8/20μ)	
Efficiency		
Peak Efficiency	99.0%	99.0%
CEC Efficiency	98.5%	98.5%
Tare Loss	< 2 W	< 2 W
Integrated String Combiner		
Fused Inputs	15 Fused Positions (5 Positions per MPPT) 15 A Standard (20, 25, 30 A accepted*)	
Temperature		
Ambient Temperature Range	-22°F to +140°F (-30°C to +60°C); Derating occurs over +122°F (+50°C)	
Storage Temperature Range	No low temp minimum to +158°F (+70°C)	
Relative Humidity (non-condensing)	0-95%	
Operating Altitude	13,123 ft (4,000 m) Derating occurs from 9,842.5 ft (3,000 m)	
Communications		
Data Logger Hardware	Standard, Internal	
SolrenView Web-Based Monitoring Service	Optional	
Revenue Grade Metering	Optional, External	
Communication Interface	RS-485 Modbus RTU	
Remote Firmware Upgrades	Standard	
Remote Diagnostics	Standard	
Features & Protections		
Arc-Fault	Standard	
Smart Grid Features	L/HVRT, L/HFRT, Soft Start, Volt-Var, Frequency-Watt and Volt-Watt, Soft-Start, Soft-Step	
Testing & Certifications		
Safety Listings & Certifications	UL 1741:2010, UL1699B, CSA-C22.2 #107.1, IEEE1547	
Advanced Grid Support Functionality	Rule 21, UL 1741SA	
Testing Agency	ETL	
FCC Compliance	FCC Part 15	
Warranty		
Standard and Options	10 year; Options for 15 or 20 years	
Enclosure		
Acoustic Noise Rating	< 60 dBA @ 1 m at room temperature	
AC/DC Disconnect	Standard, fully-integrated	
Mounting Angle**	0-90° from horizontal (vertical, angled, flat)	
Dimensions (H x W x D)	39.4 in. x 23.6 in. x 10.2 in (1000 x 600 x 260 mm)	
Weight	Inverter: 123.5 lbs (56 kg); Wiring Box: 33 lbs (15 kg)	
Enclosure Rating and Finish	Type 4X; Polyester Powder Coated Aluminum	

***Yaskawa Solectria Solar does not supply the optional fuses**
****Shade cover accessory required for installation of 75° or less**

SOLECTRIA SOLAR

YASKAWA

solaredge

Three Phase Inverters for the 277/480V Grid[1] for North America

SE10KUS / SE20KUS / SE30KUS / SE33.3KUS

	SE10KUS	SE20KUS	SE30KUS	SE33.3KUS	
OUTPUT					
Rated AC Power Output	10000	20000	30000	33300	VA
Maximum AC Power Output	10000	20000	30000	33300	VA
AC Output Line Connections	4-wire WYE (L1-L2-L3-N) plus PE				
AC Output Voltage Minimum-Nominal-Maximum[2] (L-N)	244-277-305				Vac
AC Output Voltage Minimum-Nominal-Maximum[2] (L-L)	422.5-480-529				Vac
AC Frequency Min-Nom-Max[2]	59.3 - 60 - 60.5				Hz
Max. Continuous Output Current (per Phase)	12	24	36.5	40	A
GFDI Threshold	1				A
Utility Monitoring, Islanding Protection, Country Configurable Set Points	Yes				
INPUT					
Maximum DC Power (Module STC)	13500	27000	40500	45000	W
Transformer-less, Ungrounded	Yes				
Maximum Input Voltage DC to Gnd	490				Vdc
Maximum Input Voltage DC+ to DC-	980				Vdc
Nominal Input Voltage DC to Gnd	420				Vdc
Nominal Input Voltage DC+ to DC-	840				Vdc
Maximum Input Current	13.5	26.5	39	40	Adc
Maximum Input Short Circuit Current	45				Adc
Reverse-Polarity Protection	Yes				
Ground-Fault Isolation Detection	1MΩ Sensitivity		350kΩ Sensitivity[3]		
CEC Weighted Efficiency	98		[illegible]		%
Night-time Power Consumption	< 3		[illegible]		W
ADDITIONAL FEATURES					
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional)				
Rapid Shutdown – NEC 2014 and 2017 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect[4]				
RS485 Surge Protection	Supplied with the inverter				
STANDARD COMPLIANCE					
Safety	UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07				
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (HI)				
Emissions	FCC part15 class B				
INSTALLATION SPECIFICATIONS					
AC output conduit size / AWG range	3/4" minimum / 12-6 AWG		3/4" minimum / 8-4 AWG		
DC input conduit size / AWG range	3/4" minimum / 12-6 AWG				
Number of DC inputs	2 pairs		3 pairs[5]		
Dimensions (H x W x D)	21 x 12.5 x 10.5 / 540 x 315 x 260				in / mm
Dimensions with Safety Switch (H x W x D)	30.5 x 12.5 x 10.5 / 775 x 315 x 260				in / mm
Weight	73.2 / 33.2		99.5 / 45		lb / kg
Weight with Safety Switch	79.7 / 36.2		106 / 48		lb / kg
Cooling	Fans (user replaceable)				
Noise	< 50		< 55		dBA
Operating Temperature Range	-40 to +140 / -40 to +60[6]				˚F / ˚C
Protection Rating	NEMA 3R				

[1] For 208V inverters refer to: http://www.solaredge.com/files/pdfs/products/inverters/se-three-phase-us-inverter-208V-datasheet.pdf
[2] For other regional settings please contact SolarEdge support
[3] Where permitted by local regulations
[4] P/Ns SE10K/SE20K-US0xxxxx have Manual Rapid Shutdown for NEC 2014 compliance (NEC 2017 compliance with outdoor installation)
[5] Field replacement kit for 1 pair of inputs P/N: DCD-3PH-1TBK; Field replacement kit for 3 pairs of fuses and holders P/N: DCD-3PH-6FHK-S1
[6] For power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf

RoHS

solaredge

Power Optimizer for North America

P730 / P800p / P850

Optimizer model (typical module compatibility)	P730 (for 2 x high power 72-cell PV modules)	P800p (for parallel connection of 2x 96-cell 5" PV modules)	P850* (for 2x high power or bi-facial modules)	
INPUT				
Rated Input DC Power[1]	730	800	850	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	125	83	120	Vdc
MPPT Operating Range	12.5 - 105	12.5 - 83	12.5 - 105	Vdc
Maximum Short Circuit Current (Isc)	11	14	12.5	Adc
Maximum DC Input Current	13.75	17.5	15.63	Adc
Maximum Efficiency	99.5			%
Weighted Efficiency	98.6			%
Overvoltage Category	II			
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)				
Maximum Output Current	15	18		Adc
Maximum Output Voltage	85			Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR SOLAREDGE INVERTER OFF)				
Safety Output Voltage per Power Optimizer	1 ± 0.1			Vdc
STANDARD COMPLIANCE				
EMC	FCC Part15 Class B, IEC61000-6-2, IEC61000-6-3			
Safety	IEC62109-1 (class II safety), UL1741			
Material	UL-94 (5-VA), UV Resistant			
RoHS	Yes			
INSTALLATION SPECIFICATIONS				
Compatible SolarEdge Inverters	Three phase inverters			
Maximum Allowed System Voltage	1000			Vdc
Dimensions (W x L x H)	128 x 152 x 50 / 5 x 5.97 x 1.96	128 x 158 x 59 / 5 x 6.22 x 2.32	128 x 152 x 59 / 5 x 5.97 x 2.32	mm / in
Weight (including cables)	1064 / 2.34	1090 / 2.4	1064 / 2.34	gr / lb
Input Connector	MC4 Compatible			
Output Wire Type / Connector	Double Insulated; MC4 Compatible			
Output Wire Length	2.1 / 6.9	1.8 / 5.9	2.1 / 6.9	m / ft
Operating Temperature Range[2]	-40 - +85 / -40 - +185			˚C / ˚F
Protection Rating	IP68 / NEMA6P			
Relative Humidity	0 - 100			%

[1] Rated STC power of the module. Module of up to +5% power tolerance allowed.
[2] For ambient temperature above +70˚C / +158˚F power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Application Note for more details.

PV SYSTEM DESIGN USING A SOLAREDGE INVERTER[3][4]		THREE PHASE 208V		THREE PHASE 480V		
Compatible Power Optimizers		P730[5]	P800p, P850[5]	P730	P800p, P850	
Minimum String Length	Power Optimizers	8		13		
	PV Modules	16		26		
Maximum String Length	Power Optimizers	30		30		
	PV Modules	60		60		
Maximum Power per String		6000[6]	7200	12750[7]	15300	W
Parallel Strings of Different Lengths or Orientations		Yes				

[3] P800p and P850 can be mixed in one string. It is not allowed to mix P730 with P800p/P850 in one string or to mix P730/P800p/P850 with P300/P320/P400/P405 in one string.
[4] In a case of odd number of PV modules in one string it is allowed to install one P730/P800p/P850 power optimizer connected to one PV module. When connecting a single module to the P800p seal the unused input connectors with the supplied pair of seals.
[5] P730/ P800p/ P850 design with three phase 208V inverters is limited. Use the SolarEdge Site Designer for verification.
[6] For SE14.4KUS/SE43.2KUS: It is allowed to install up to 6,500W per string when 3 strings are connected to the inverter (3 strings per unit for SE43.2KUS) and when the maximum power difference between the strings is up to 1,000W.
[7] For SE30KUS/SE33.3KUS/SE66.6KUS/SE100KUS: It is allowed to install up to 15,000W per string when 3 strings are connected to the inverter (3 strings per unit for SE66.6KUS/SE100KUS) and when the maximum power difference between the strings is up to 2,000W.
* P850 replaced the P800s; they can be used interchangeably and can be connected in the same string.

CE

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

PUREPOWER ENGINEERING
5 MARINE VIEW PLAZA HOBOKEN, NJ
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RICHARD A. IVINS
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DEVELOPER
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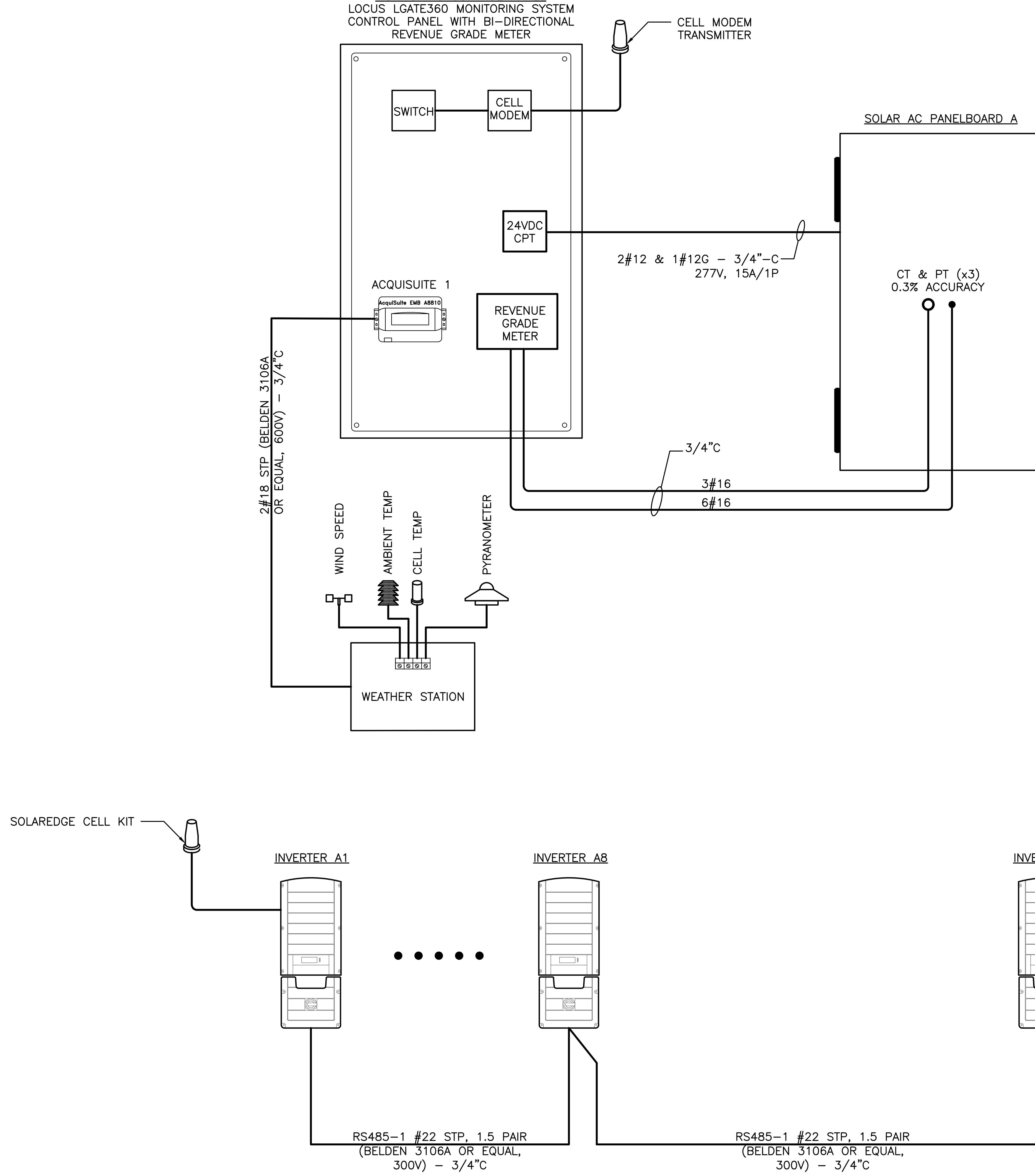
2729.60KW SOLAR SYSTEM AT TAUBMAN WESTFARMS MALL
1500 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

DRAWING TITLE
EQUIPMENT DATA SHEETS

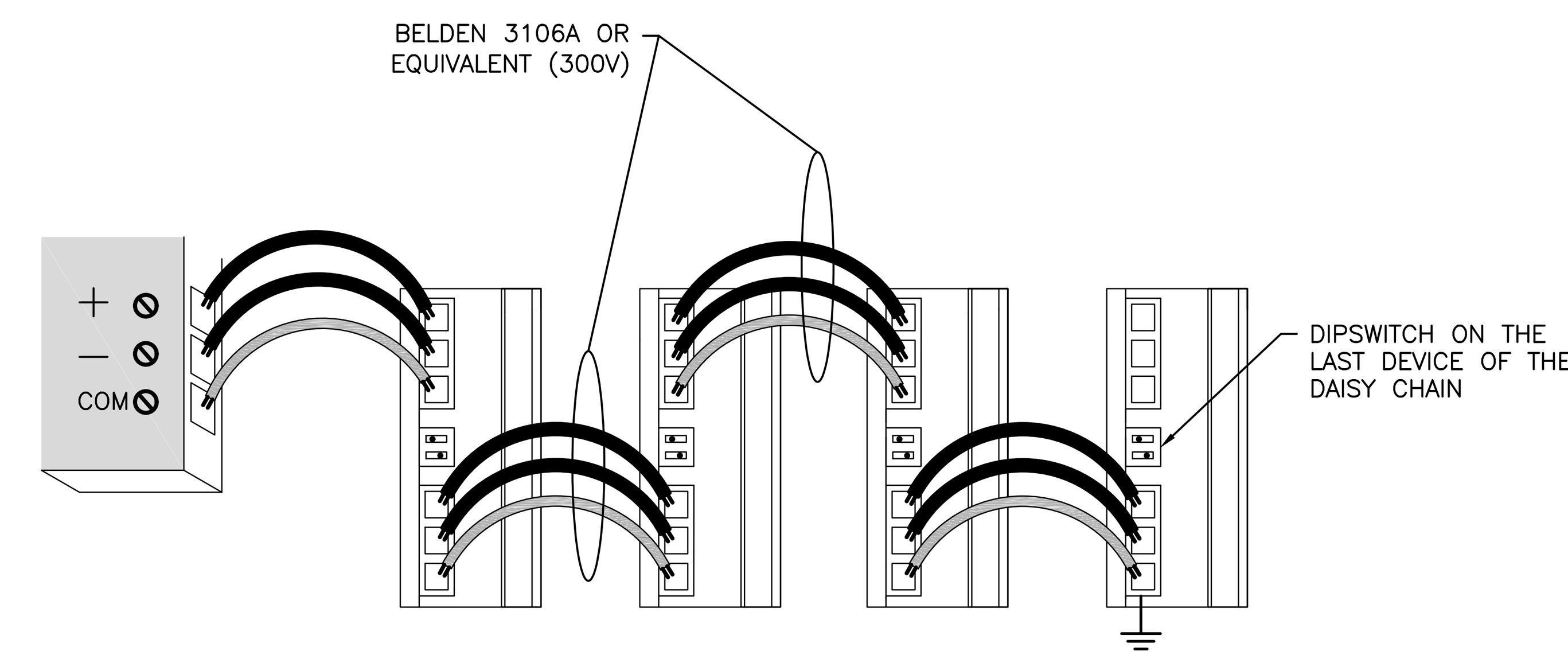
30 OF 32
DRAWING #
E601

MONITORING NOTES:

1. REFER TO MONITORING SYSTEM INSTALLATION MANUAL FOR DETAILS ON TERMINAL BLOCKS, CABLE TERMINATIONS, AND SYSTEM CONFIGURATION.
2. WIRELESS TRANSCEIVERS MUST HAVE LINE-OF-SIGHT BETWEEN EACH OTHER.
3. PYRANOMETER MUST BE INSTALLED IN UNSHADED LOCATION.



1 E700 MONITORING SYSTEM A
SCALE: NONE



3 E700 INVERTER MODBUS DETAIL
SCALE: NONE

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
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RICHARD A. IVINS
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DEVELOPER
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PAGE SIZE 36" x 24"
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PROJECT
2729.60KW SOLAR SYSTEM AT
TAUBMAN WESTFARMS MALL
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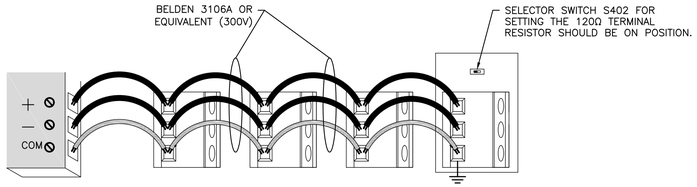
WEST HARTFORD, CT 06110

DRAWING TITLE
MONITORING SYSTEM A
WIRING DIAGRAM

DRAWING #
E700

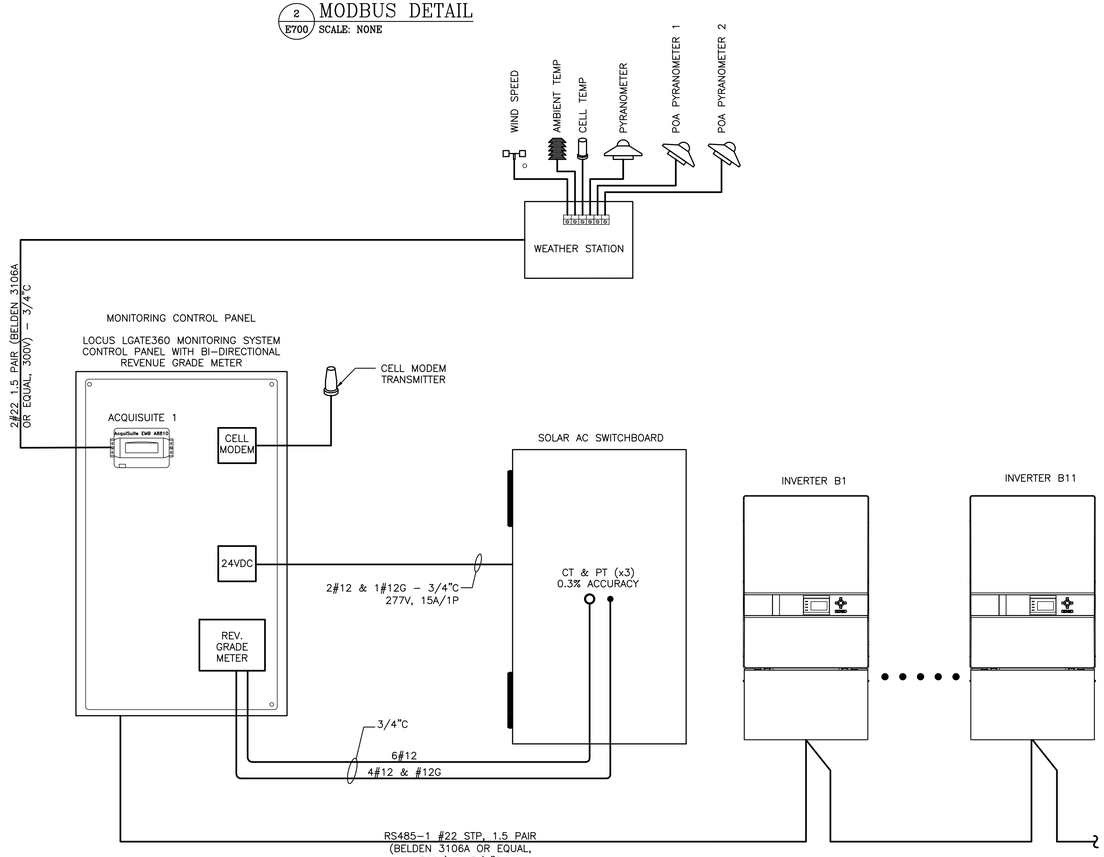
PLOT DATE: 10/22/2018 2:14 PM
RULER IN INCHES:



2 E700 MODBUS DETAIL
SCALE: NONE

MONITORING NOTES:
1. REFER TO MONITORING SYSTEM INSTALLATION MANUAL FOR DETAILS ON TERMINAL BLOCKS, CABLE TERMINATIONS, AND SYSTEM CONFIGURATION.

2. PYRANOMETER MUST BE INSTALLED IN UNSHADED LOCATION.



NOTE: TYPICAL FOR SYSTEM C

1 E701 MONITORING SYSTEMS B & C
SCALE: NONE

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/15/2018	CONSTRUCTION DOCUMENTS	BX	CC	RI
08/21/2018	DESIGN DEVELOPMENT	BX	CC	RI

PUREPOWER ENGINEERING
5 MARINE VIEW PLAZA HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. WINDS
CT LICENSE No. 0093982

ENGINEER'S CONNECTION
RICHARD A. WINDS
No. 0093982
REGISTERED PROFESSIONAL ENGINEER
STATE OF CONNECTICUT

DEVELOPER: Safari Energy

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DRAWING TITLE
MONITORING SYSTEMS B & C
WIRING DIAGRAM

32 OF 32

DRAWING #
E701