

September 28, 2023

ADDENDUM NO. 5

PROPOSAL FOR FURNISHING ALL LABOR, MATERIALS, EQUIPMENT, TRANSPORTATION, SUPERVISION, PERMITS, ETC. NECESSARY FOR THE ULL CLECO ALTERNATIVE ENERGY RESEARCH CENTER MICROGRID PROJECT, LOCATED ON THE UL LAFAYETTE CAMPUS-CLECO, IN CROWLEY, LOUISIANA.

Due Thursday October 5, 2023 2:00 PM Solicitation No. 24203

The following is to be made part of the original specifications as though issued at the same time and shall be incorporated integrally therewith. This addendum shall be acknowledged on the BID FORM when submitted to the Purchasing Department prior to the bid due date/time.

Item No. 1

Attached are the latest plan sets following page 2 of this addendum. Most of the questions referred to the cement slab outside the building, and we now have a stamped structural drawing from the professional engineer in the document entitled, "ULL-CLECO_With_Racking_Stamped 9_26_23.

The other questions are answered in Item No. 2 (below).

Item No. 2

Contractor question:	Department response:
(1) Please advise if more information can be provided on the slab detail in reference to elevation, if fill will be required, and type of rebar or wire mesh required for the equipment rack near the building and the DC combiner box.	Please see updated plan sets.
(2) Who will be responsible for the sink and eye wash station relocation in the building where new batteries are to be installed?	The university will take care of moving the sink and eye wash station prior to the contractor starting work.
(3) Please provide more information on the 2" rigid pipe required for the equipment rack near the building.	Please see updated plan sets.
(4) The anchor bolts in the slab for the combiner box are to be hilti anchor bolts or can we just put a galvanized Unistrut in the slab?	Please see updated plan sets.
(5) Please provide more information on rack post on equipment rack.	Please see updated plan sets.
(6) Who will be responsible for the survey of the panels and the DC combiner box pad?	The University will be responsible for the survey.



Purchasing Office
P.O. Box 40197 • Lafayette, LA 70504-0197
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This is a public works bid. The addendum **MUST** be acknowledged with your bid on the BID FORM. For questions related to bidding these projects, please contact the UL Lafayette Purchasing Department at bids@louisiana.edu or 337.482.2955.

Marie C. Frank, MPA, CPPB
Assistant Vice President for Administration & Finance
University of Louisiana at Lafayette
Department of Purchasing

1.0 GENERAL INFORMATION

1. Unless otherwise noted or detailed, concrete pads for mechanical equipment shall be 8" thick (minimum) and reinforced with #4 @ 12" O.C. each way centered.
2. Backfill both sides of all foundation and retaining walls equally until low side is up to finish grade. Do not backfill any walls with #4 @ 12" O.C. each way centered.
3. All concrete shall be placed in accordance with the provisions of the American Concrete Institute (ACI) 308R-11, Building Code of Standard Practice for Buildings and Bridges, March 7, 2000, concrete drawings. Per Sect 7.10.3 of "Temporary supports, such as temporary guys, braces, falsework, cribbing or other elements required for the erection operation will be determined, furnished and installed by the erector."
4. Weights of mechanical equipment shown on the structural plans are for units specified by the Mechanical Engineer. Contractor shall ensure that no construction load exceeds the design live loads indicated on the structural drawings and that these loads are not put on the structural members prior to the time that all framing members and their connections are in place. Equipment pads and penetrations through the structure for mechanical, electrical and plumbing work shall be verified by the Contractor. Openings and penetrations not specifically shown on the structural drawings shall be subject to approval by the Structural Engineer of Record.
5. Prior to fabrication and/or erection of any materials, the Contractor shall verify all pertinent existing dimensions, elevations, and conditions and shall report any discrepancies to the Structural Engineer of Record or the Architect.
6. If additional information or details are deemed by the contractor or subcontractors or if discrepancies arise and require a clarification either in these plans or specifications, it is the responsibility of the contractor to request additional information or clarification in writing to the EOR as promptly as possible.
7. Contractor shall engage the entire set of plans to understand the design intent, and shall not isolate any one discipline's of plans.
8. Contractor shall construct any portion of the project as information may be cross referenced in another portion of the complete set of plans.
9. All mechanical equipment, including duct supports, need to be submitted for structural review. Submittal should include support locations, point load, and structural attachment details.

2.0 EARTHWORK

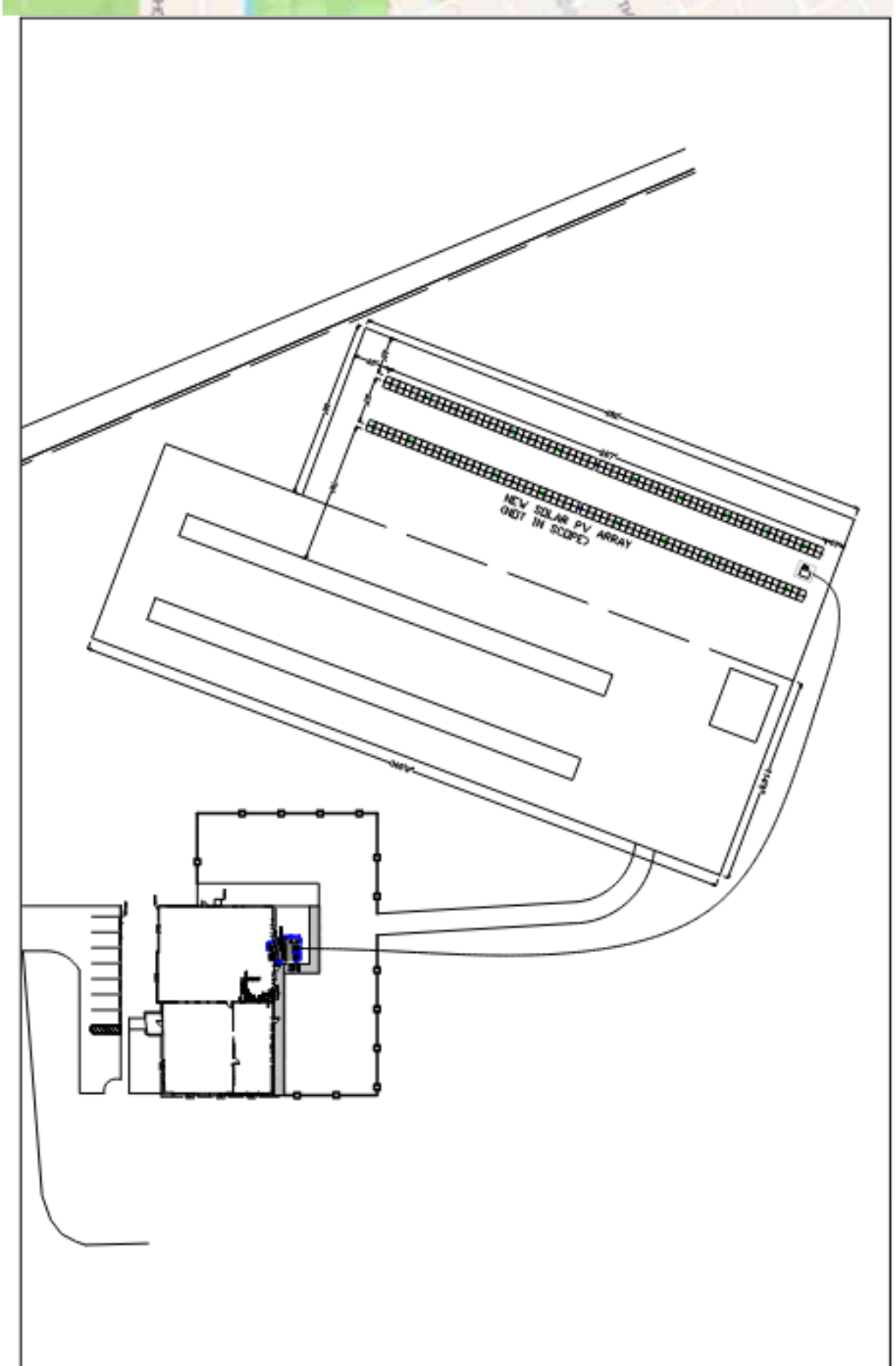
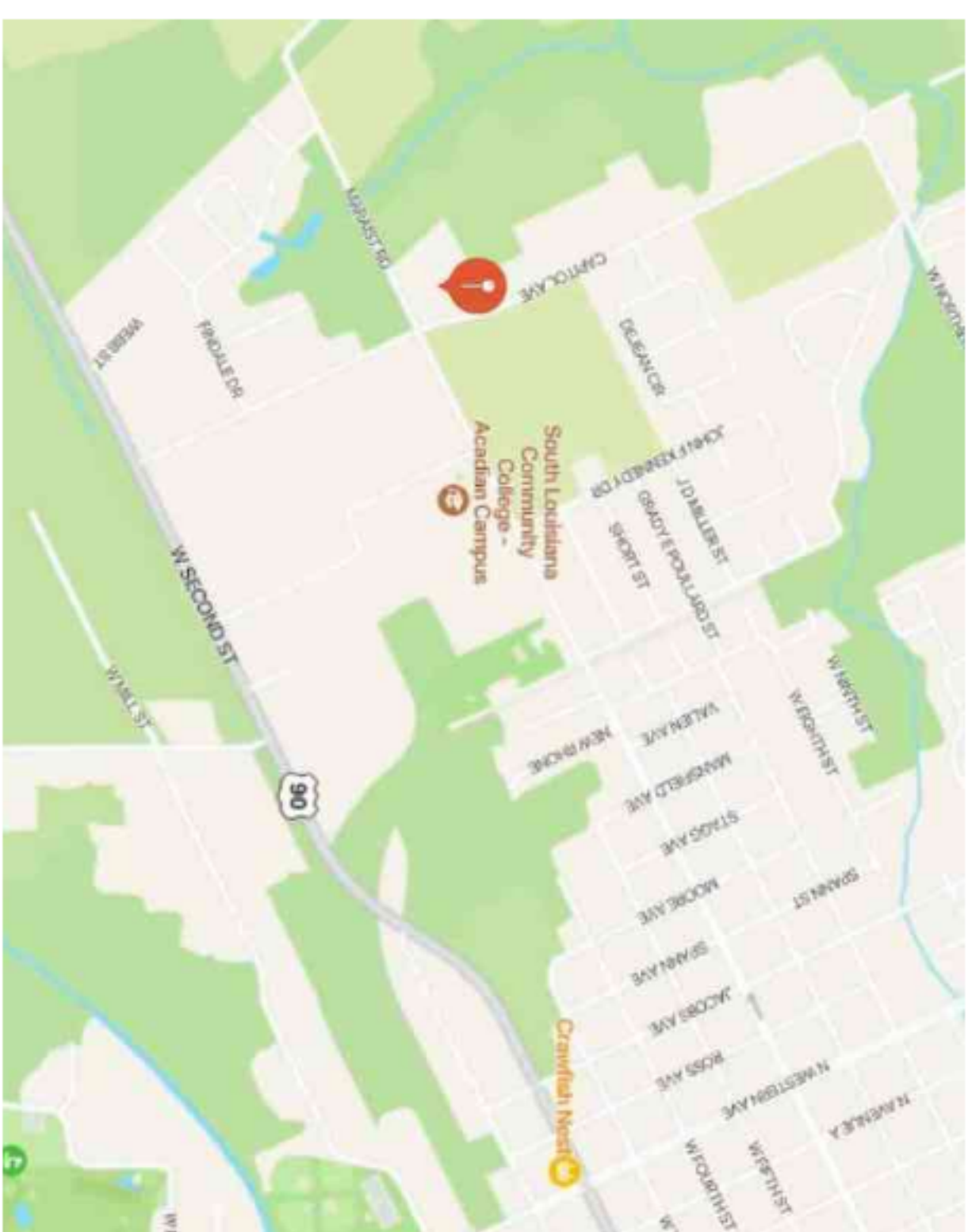
1. Refer to "Foundations" section in these General Notes for bearing values and referenced Geotechnical report, as applicable.
2. Applicable separation shall be in accordance with the recommendations given in the referenced Geotechnical Report, as applicable.
3. Strip area of all gravel, surface vegetation, topsoil, and any debris. Remove all existing structures, foundations, and below grade site features.
4. If the soil at the bearing elevations shown is of questionable bearing value, the Structural Engineer of Record or Architect shall be notified in writing to the EOR as promptly as possible.
5. After excavations are completed and before placing concrete, the excavated areas shall be inspected and approved by the Owner's selected independent testing laboratory.
6. A 6-mil minimum polyethylene film vapor retarder, meeting the requirements in the specifications, shall be placed below all slabs-on-grade, unless noted otherwise. Lap 12" to accommodate pouring direction.

3.0 FOUNDATIONS

1. Footings shall bear 24" below existing grade.
2. Allowable bearing capacity is 2000 psf as per Geotechnical Report performed by GeoConsultants, LLC, dated April 8, 2011.
3. Follow all recommendations contained in Geotechnical Report for fill material, amounts, and quality.
4. Follow all recommendations contained in Geotechnical Report for void space around slabs, grade beams, and all other elements of the project not detailed herein.
5. Follow all recommendations contained in Geotechnical Report for shallow foundations and subgrade preparation.
6. Extend fill area 5ft from edge of concrete pad. Ensure fill extends to not interfere with previous fill of existing building.
7. The design assumes that the existing building was constructed following the recommendations of the Geotechnical Reference Geotechnical Report mentioned above for information not provided herein.
- 8.

4.0 CAST-IN-PLACE CONCRETE

1. Arrangement and bending of reinforcing steel shall be in accordance with ACI 315 Detailing Manual, latest edition.
2. Reinforcing steel shall be new and all bars shall be determined.
3. Unless noted otherwise, bar laps shall be Class B tension laps and shall be lapped with minimum lengths as listed in the schedule, where splices are required in reinforcing. Shorter laps may be acceptable if specific locations of alternate laps are shown on the reinforcement placement drawings and calculations are submitted by a Registered Professional Engineer.
4. Provide suitable wire spacers, chairs, ties, etc. for supporting reinforcing steel in the proper position while placing concrete. For pile support slab on grade provide "triquetel" support for mid-depth placement. Do not "wet stick" dowels.
5. Minimum concrete protective covering for reinforcement at surfaces not exposed directly to the ground shall be 1 1/2" for slabs, 2" for walls, and 3" for columns.
6. Minimum concrete protective covering for reinforcement at surfaces which will be exposed to the weather or in contact with the ground shall be 2" for bar size #6 and larger and 1 1/2" for #5 bars or smaller unless noted otherwise. Provide 3" cover below and at ends of footing and pile cap bars unless noted otherwise.
7. Locations and sizes of openings, sleeves, etc. required for other trades must be verified by these trades before placing.
8. All slots, sleeves, trenches, and other embedded items shall be set and secured against movement before the concrete is placed. See Architectural, Electrical, Mechanical, Plumbing, and Vendor drawings for sizes and locations. Coordinate locations, spacing, and sizes with the Structural Engineer of Record prior to pouring concrete.
9. As part of the submittal process, the Electrical and Mechanical Contractor(s) shall submit a proposed routing plan for all pipes, conduits and cables. The routing plan shall show the proposed routing of all pipes, conduits and cables, including any proposed embedded items (referencing proximity to beam, column, and slab edges). No items shall be allowed to be embedded in the concrete without prior written approval from the Structural Engineer of Record.
10. Conduits and pipes embedded in concrete slabs may be no larger than 1/3 of the slab thickness (based on the maximum outside diameter) and shall have a center-to-center spacing no less than three (3) conduit diameters. Regardless of diameter, no more than four conduits may be placed adjacent to each other without prior approval in writing from the Structural Engineer of Record.
11. No aluminum conduits, devices, or fixtures may be embedded into the concrete so that the aluminum is in direct contact with the concrete.
12. All aluminum conduits, devices, or fixtures shall be placed in slots within 12 inches of column face or face of bearing wall.
13. Corner bars shall be provided for all horizontal reinforcing bars at the intersections and corners of all strip footings, beams, and walls unless noted otherwise. Corner bars shall be of the same size and grade as the horizontal reinforcing they connect. See Typical Details for more information.
14. Saw cuts shall be made as soon as the concrete can support the saw without damaging the surface (eight (8) hours max from start of the pour).
15. All start of the saw cut shall be made with a minimum of 2" of concrete thickness.
16. All elevator pit walls and foundations shall be poured with "Xypex" or approved equal waterproofing additive.
17. Any and all new concrete thickness shall be a minimum of 2" at any location. If any detail or section indicates less than 2", the contractor is required to bring to the attention of the EOR prior to the placement of concrete.
18. Any formwork supported concrete base on grade shall have a minimum of 4" of compacted sand fill and expansion joints shall be spaced at a maximum of 10 feet.
19. ANY CONCRETE PLACED BENEATH A STRUCTURE (i.e. metal deck, roof deck) that does not allow direct sun at the time of placement shall not contain fly ash in the ready mix.
20. Provide (2) #4 bars 24" long at all re-entrant corners. Corner bar on corner, space 2" from edge and 2" apart.
21. Provide (2) #4 bars 24" long at all re-entrant corners. Corner bar on corner, space 2" from edge and 2" apart.
22. Shoring of concrete for elevated pours shall comply with ACI 317 "Guide for Shoring/Reshoring of Concrete Multistory Buildings".



EXCAVATION AND FILL PER GEOTECHNICAL REPORT REQUIRED ON THIS SIDE OF PAD

MIN. 5'-0"

VERIFY IN FIELD THAT SAND FILL WAS USED 5FT PAST EXTENTS OF BUILDINGS AS STATED IN GEOTECH REPORT. IF SAND FILL IS PRESENT IN THIS LOCATION, EXCAVATION IS NOT REQUIRED BETWEEN SLAB LOCATION AND BUILDINGS

10' - 0"

2' S100

2' S100

2' S100

2' S100

2' S100

2' S100

2' S100

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2' S100

2' S100

2' S100

2' S100

EXCAVATION AND FILL PER GEOTECHNICAL REPORT REQUIRED UNDER PAD. EXTEND 5FT PAST EXTENTS OF PAD WHERE SAND FILL DOES NOT ALREADY EXIST

MIN. 5'-0" FROM CORNER

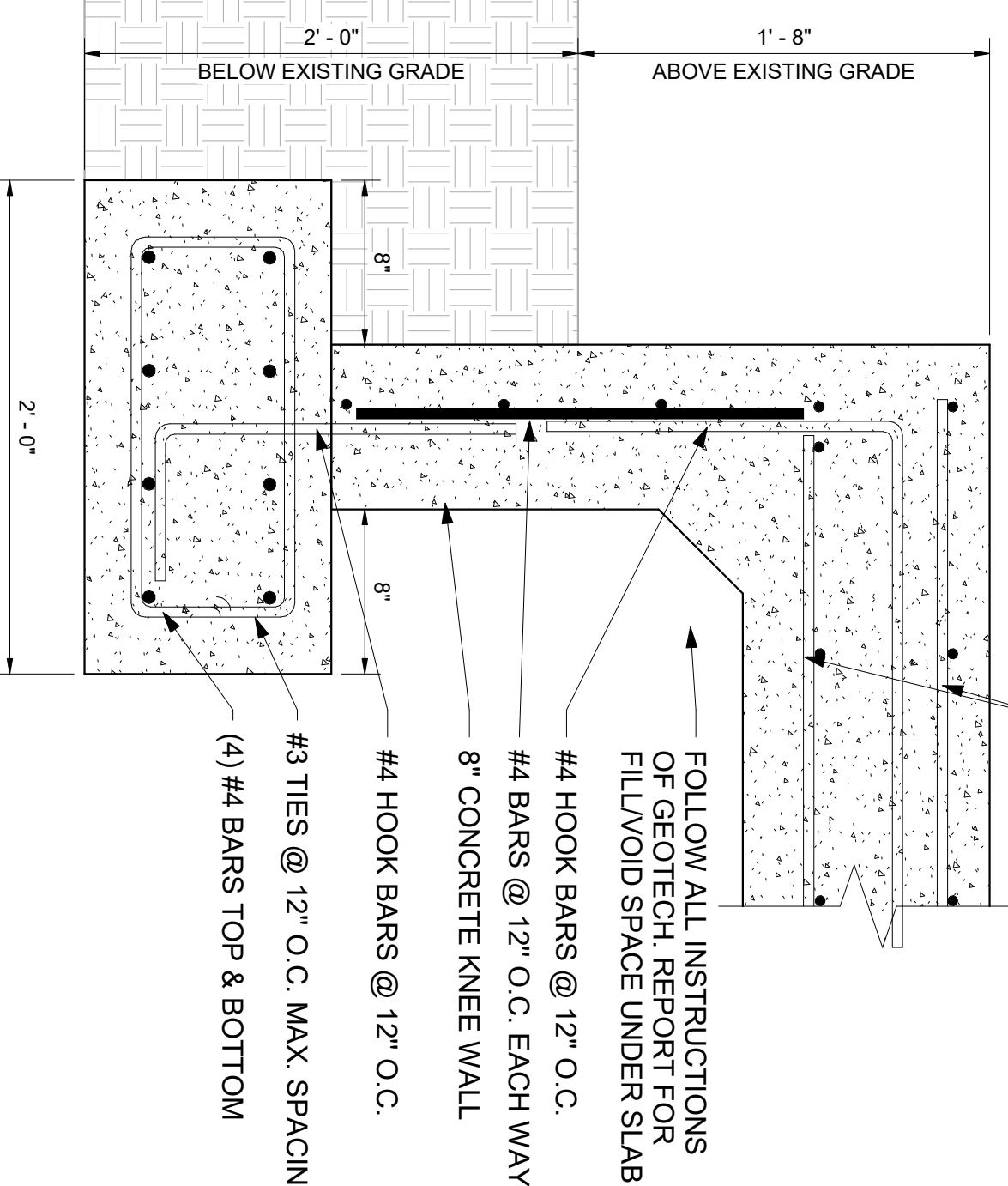
EXISTING BUILDING

EXISTING BUILDING

VERIFY IN FIELD THAT SAND FILL WAS USED 5FT PAST EXTENTS OF BUILDINGS AS STATED IN GEOTECH REPORT. IF SAND FILL IS PRESENT IN THIS LOCATION, EXCAVATION IS NOT REQUIRED BETWEEN SLAB LOCATION AND BUILDINGS

1 Equipment Pad Plan View
S100 1/2" = 1'-0"

2 Turndown Detail
S100 1 1/2" = 1'-0"



- FOUNDATION AND GROUND FLOOR PLAN NOTES**
1. EXISTING GROUND FLOOR SLAB ELEVATION IS REFERENCED AS DATUM UNLESS NOTED OTHERWISE.
 2. TOP OF PAD ELEVATION IS AT DATUM UNLESS NOTED THIS ON PLAN FROM DATUM.
 3. DENOTES 12" SLAB ON GRADE W/ 2 WAYS OF #4 BARS @ 12" O.C. BOTH WAYS. PLACE BOTTOM MAIN 3" FROM BOTTOM OF SLAB.
 4. COORDINATE ALL NEW AND EXISTING UNDERGROUND UTILITIES WITH FOUNDATIONS AND SUBMIT ALL PROPOSED SLEEVE LOCATIONS TO ARCHITECT FOR REVIEW.
 5. REFER TO STRUCTURAL SPECIFICATIONS, GENERAL NOTES, AND SCHEDULE FOR ALL DIMENSIONS AND CONNECTIONS.
 6. REFER TO PV SHEETS FOR PIPE HEIGHT, STRUT BRACING LOCATIONS AND U-BOLT CONNECTIONS.
 7. FOLLOW ALL HLT MANUFACTURER INSTRUCTIONS AND EDGE DISTANCE REQUIREMENTS FOR ANCHOR BOLTS.

SLAB REINFORCEMENT: #4 BARS @ 12" O.C. BOTH WAYS

FOLLOW ALL INSTRUCTIONS OF GEOTECH. REPORT FOR FILL/VOID SPACE UNDER SLAB

- #4 HOOK BARS @ 12" O.C.
- #4 BARS @ 12" O.C. EACH WAY
- 8" CONCRETE KNEE WALL
- #4 HOOK BARS @ 12" O.C.
- #3 TIES @ 12" O.C. MAX. SPACING
- (4) #4 BARS TOP & BOTTOM

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NO.	REVISION.	DATE
CD Set	UL Energy Center - CLECO	9/7/2023
Intersection of: Marais Road & Capital Avenue Crowley, LA		
JOB NO		
Foundation Plan	TITLE	
As indicated	SCALE	
AW/JJP	DRAWN/CHK	
S100		

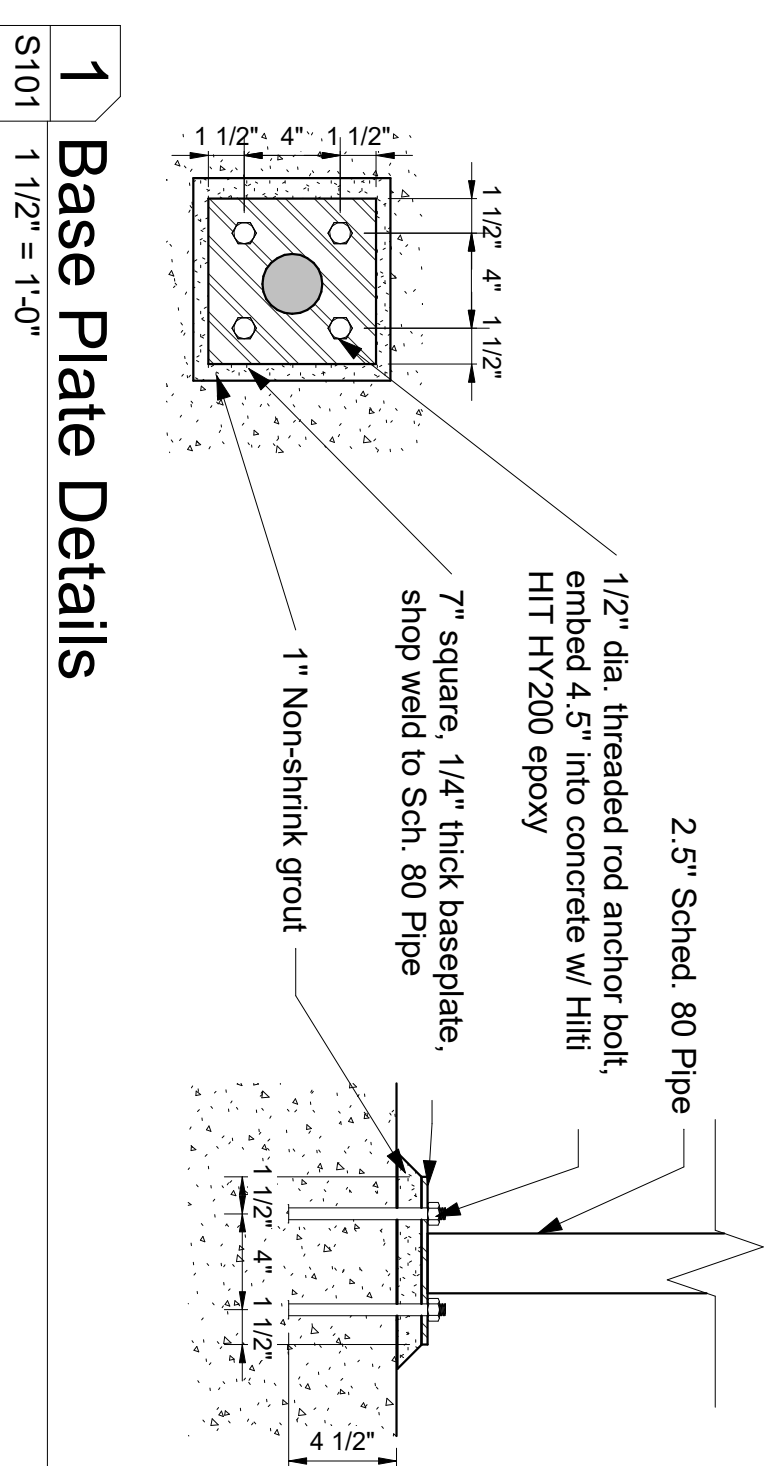


11.0 ADHESIVE ANCHORS AND DOWELS

1. Except where indicated on the drawings, post-installed anchors shall consist of the following anchor types as provided by the manufacturer at (601) 979-5000 for product related questions.
 - A. **Anchorages to Concrete**
 - a. **Adhesive Anchors For Cracked And Uncracked Concrete use:**
 1. **Hilti HIT-HY 200 SAFE SET system with the Hilti HIT-z rod per ICC ESR- 3187**
 2. **Hilti HIT-HY 200 SAFE SET system with Hilti Hollow Drill Bit and vacuum system**
 3. **Hilti HIT-HY 500 V3 SAFE SET system with Hilti Hollow Drill Bit and vacuum system with HAS threaded rod per ICC ESR-3814**
 4. **Hilti HIT-RE 800 V3 SAFE SET system with Hilti Roughening Tool (HIT-RT) with HAS threaded rod per ICC ESR-3814 for diamond core holes**
 5. **threaded rod per ICC ESR-3814 for diamond core holes**
 - a. Steel Element for use with Adhesive: CARBON STEEL ROD
 - b. HILTI HAS-F-48 Grade 45 CARBON STEEL ROD
 - c. HILTI HAS-B-105 Grade 105 CARBON STEEL ROD
 - d. HILTI HAS-R-304 STAINLESS STEEL ROD
 - e. HILTI HAS-R-316 STAINLESS STEEL ROD
 - f. HILTI HIT-Z ROD with HY 200 ONLY
 - b. **Medium Duty Mechanical Anchors For Cracked Concrete use:**
 1. **HILTI KWIK BOLT expansion anchor SAFE SET system with Hollow Drill Bit and vacuum per ICC ESR-3027**
 2. **HILTI KWIK BOLT-TZ expansion anchor SAFE SET system with Hollow Drill Bit and vacuum and SH-T-AZZ tool with Adaptive Torque for applicable size per ICC ESR-1917**
 3. **ESR-1917 BOLT-TZ expansion anchor SAFE SET system with Hollow Drill Bit and vacuum and SH-T-AZZ tool with Adaptive Torque for applicable sizes (Uncracked concrete only) per ICC ESR-2202**
 - c. **Heavy Duty Mechanical Anchors For Cracked And Uncracked Concrete use:**
 1. **Hilti HDA Undercut Anchors per ICC ESR 1546**
 2. **Hilti HSL-3 Expansion Anchors per ICC ESR 1545**
 - B. **Rebar Doweling**
 - a. **Adhesive Anchors for cracked and uncracked concrete use:**
 1. **Hilti HIT-HY 200 SAFE SET system with Hilti Hollow Drill Bit and vacuum with continuously deformed rebar per ICC ESR-3187**
 2. **Hilti HIT-HY 500 V3 SAFE SET system with Hilti Hollow Drill Bit and vacuum system with continuously deformed rebar per ICC ESR-3814**
 3. **Hilti HIT-RE 800 V3 SAFE SET system with Hilti Hollow Drill Bit and vacuum with continuously deformed rebar per ICC ESR-3814 in diamond cored holes**
 - C. **Anchorages to Solid Grouted Masonry**
 - a. **Adhesive Anchors use:**
 1. **HILTI HIT-HY 270 SAFE SET system with Hilti Hollow Drill Bit and vacuum per ICC ESR-4144**
 2. **Steel anchor element shall be Hilti HAS continuously threaded rod or continuously deformed steel rebar**
 - b. **Mechanical Anchors use:**
 1. **Hilti Kwik Bolt-3 expansion anchors per ICC ESR 1385**
 - D. **Anchorages to Hollow / Multi-Mix Masonry**
 1. **Adhesive Anchors use:**
 1. **Hilti HIT-HY 270 masonry adhesive anchoring system per ICC ESR-4144**
 2. **Steel anchor element shall be Hilti HAS continuously threaded rod or continuously deformed steel rebar**
 3. **The appropriate size screen tube shall be used per adhesive manufacturer's instructions approved by the Structural Engineer of Record. Substitution requests for alternative products must be approved in writing by the Structural Engineer of Record prior to use. Contractor shall provide calculations demonstrating that the substituted product is capable of achieving the performance values of the specified product. Substitutions will be evaluated by their having an ICC ESR showing compliance with the relevant building code for seismic uses, local resistance, installation category, and availability of comprehensive installation instructions. Adhesive anchor installation shall be performed in accordance with the manufacturer's instructions.**
 4. **Install anchors per the manufacturer instructions, as included in the anchor packaging.**
 5. **Overhead adhesive anchors must be installed using the Hilti Profi Pistol Plug System.**
 6. **The contractor shall arrange an anchor manufacturer's representative to provide onsite installation training for all of their anchoring products specified. The Structural Engineer of Record must receive documented confirmation that the contractor has received the necessary training for the use of the adhesive anchors.**
 7. **Anchor capacity is dependent upon spacing between adjacent anchors and proximity of anchors to edge of concrete. Install anchors in accordance with spacing and edge clearances indicated on the drawings. Existing reinforcing bars in the concrete structure may conflict with specific anchor locations. Unless noted on the drawings, the bars can be cut; the contractor shall review the existing structural drawings and shall undertake the necessary field work to determine the locations of the concrete anchors. If Hilti PS 1000 or other GPR, X-Ray, chipping or other approved means.**

5.0 STRUCTURAL STEEL

1. Unless noted otherwise, fabrication and erection of structural steel shall be in accordance with AISC specifications, latest edition.
2. Unless detailed otherwise or reactions are indicated, beam connections shall be selected to support one-half the total uniform load capacity shown in the **ALLOWABLE UNIFORM LOAD TABLES** in Part 2 of the AISC Steel Construction Manual, 13th Edition, for the given beam depth, bolt diameter and weld specification, whichever is greater. The minimum beam connection shall not be smaller than those listed in Tables 10-1 and 10-2 of the AISC Steel Construction Manual, 13th Edition for the given beam depth, bolt diameter and weld specification.
3. The Fabricator shall be responsible for the design and adequacy of all connections that are not designed or fully detailed on the Contract Documents. Shop drawings, depicting the configuration and fabrication details, along with calculation sheets and design notes, shall be provided to protect in the state in which the project is located, shall be submitted to the Structural Engineer of Record for review.
4. Unless otherwise noted, beam reactions shown on the Plans are design Service Level (ASD) gravity (Dead Load plus Live Load) shear loads. Any axial or other loads required must be considered in addition to the vertical reactions shown.
5. Unless detailed otherwise, all shop connectors shall be welded. Unless detailed otherwise, all field connectors shall be bolted. All field connectors shall be bolted in accordance with the AISC Specification for Structural Steel Buildings, 13th Edition, unless otherwise noted.
6. Unless noted otherwise, all fillet welds shall be 1/4". All welding of structural steel shall be done in accordance with the latest edition of AWS D1.1 corresponding to the AISC specification used and all welds including field welds shall be made by certified welders using E70XX electrodes.
7. Unless noted otherwise, all high-strength bolts (A325, F1862, and A490) shall be tensioned to meet slip critical requirements as a "single-flange" bearing connection. All joints shall be designed to be bearing type connections unless noted otherwise.
8. Steel frames are non-self-supporting and column anchor rods are designed for a completed condition only. Composite slab and reinforced masonry SHEAR WALLS are required to provide lateral stability for the frame and building. This includes resistance to wind and seismic forces during and after construction. The Contractor shall provide all the temporary bracing bracing plans to the EOR for review.
9. All steel exposed to view at close of project shall be classified as "Architecturally Exposed Structural Steel" and shall meet the requirements of Section 10 of AISC's Code of Standard Practice for Steel Buildings and Bridges, March 18, 2005.
10. All steel members exposed to weather shall be hot-dip galvanized or painted with TME/EC Epoxy System or similar primer system. All steel members shall be primed with TME/EC red or grey oxide primer or similar system meeting the requirements for painting structural steel in the project specifications. All primers shall be compatible with top coatings specified.
11. All steel members that are to receive spray or trowel applied, cementitious based, fire-resisting coatings shall be furnished without prime coatings unless otherwise noted.
12. All steel members shall include the costs for all miscellaneous steel in their bid regardless of whether or not those items are listed on the structural drawings. These costs shall include, but are not limited to: miscellaneous steel items shown on Architectural, Civil, Mechanical, Plumbing, and Electrical drawings.
13. Bearing ends of all columns shall be square cut or milled to bear.
14. Field cutting, drilling, or other modification of structural steel components is not permitted without written approval of the Structural Engineer of Record. Where beam penetrations cannot be avoided or where cutting is required, the Contractor shall provide a Structural Steel Detail with beam penetration including penetration shape, size, location, and method of cutting the openings.



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09/26/2023

JOHANN L. PALACIOS
License No. 3583
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
STATE OF LOUISIANA

UL Energy Center - CLECO
Intersection of:
Marais Road & Capital Avenue
Crowley, LA
JOB NO

Metal Rack Details
TITLE
SCALE

As indicated

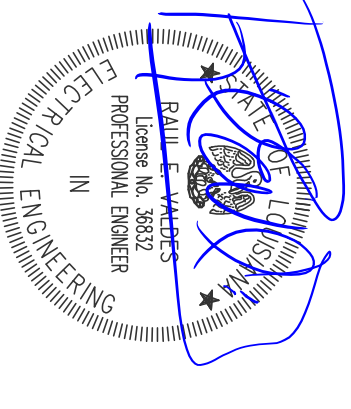
Author /Checker
DRAWN/CHK

NO. REVISION DATE

CD Set 9/7/2023

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S101



General Notes
MICROGRID SYSTEM
WITH GROUND MOUNT PV

No.	Issue	Date

Project Name and Address

UNIVERSITY OF LOUISIANA
AT LAFAYETTE-CLECO
POWER 2008 HUTCHINSON
AVE CROWLEY, LA 70526

Drawn By	DAE	Sheet	
Date	04/13/2023	E000	
Scale	N/A		

LEGEND - GENERAL

- DASHED LINES INDICATE FUTURE.
 - LIGHT LINES INDICATE EXISTING OR BEYOND THE PROJECT SCOPE
 - DARK LINES INDICATE NEW OR WITHIN THE PROJECT SCOPE
 - TEXT LIGHT TEXT INDICATES EXISTING OR BEYOND THE PROJECT SCOPE
 - TEXT DARK TEXT INDICATES NEW OR WITHIN THE PROJECT SCOPE
- LEGEND - SYMBOLS**
- ☐ SOLAR MODULE
 - ⊞ JUNCTION BOX
 - ☒ PANEL BOARD
 - CIRCUIT BREAKER
 - ⏚ DC/AC INVERTER
 - ⏚ TRANSFORMER
 - ⏚ CURRENT TRANSUDCER
 - ⏚ DISCONNECT SWITCH
 - ⏚ FUSED DISCONNECT SWITCH
 - ⏚ FUSE
 - ⏚ EARTH GROUND

ABBREVIATIONS

- φ DIAMETER OR PHASE
- A AMPERES
- AFCI ARC FAULT CIRCUIT INTERRUPTER
- AIC AMPS INTERRUPTING CAPACITY
- ATS AUTOMATIC TRANSFER SWITCH
- BKR CIRCUIT BREAKER
- C CONDUIT
- CB COMBINER BOX
- CT CURRENT TRANSUDCER
- CP CONTROL PANEL
- CU COPPER
- DISC DISCONNECT
- EXISTING EXISTING
- EQUIPMENT GROUNDING CONDUCTOR EQUIPMENT GROUNDING CONDUCTOR
- ELECTRIC, ELECTRICAL ELECTRICAL, ELECTRICAL
- ELECTRICAL METALLIC TUBING ELECTRICAL METALLIC TUBING
- EQUIPMENT EQUIPMENT
- FUTURE FUTURE
- GROUND GROUND
- GROUNDING ELECTRODE CONDUCTOR GROUNDING ELECTRODE CONDUCTOR
- GROUND FAULT CIRCUIT INTERRUPTER GROUND FAULT CIRCUIT INTERRUPTER
- GROUND FAULT PROTECTION OF EQUIPMENT GROUND FAULT PROTECTION OF EQUIPMENT
- HIGH-INTENSITY DISCHARGE (LIGHTNING) HIGH-INTENSITY DISCHARGE (LIGHTNING)
- INTERMEDIATE METALLIC TUBING INTERMEDIATE METALLIC TUBING
- 1000 AMPS INTERRUPT CAPACITY 1000 AMPS INTERRUPT CAPACITY
- 1000 CIRCULAR MILS 1000 CIRCULAR MILS
- KILO-VOLT AMPERE KILO-VOLT AMPERE
- KILOWATT KILOWATT
- LIGHTNING AND SURGE ARRESTOR LIGHTNING AND SURGE ARRESTOR
- LONG, SHORT, INSTANTANEOUS, AND GROUND FAULT LONG, SHORT, INSTANTANEOUS, AND GROUND FAULT
- MAXIMUM MAXIMUM
- MAIN CONTROL PANEL MAIN CONTROL PANEL
- MANUFACTURER MANUFACTURER
- MAIN LUGS ONLY MAIN LUGS ONLY
- MINIMUM MINIMUM
- NATIONAL ELECTRICAL MANUFACTURERS ASSOC. NATIONAL ELECTRICAL MANUFACTURERS ASSOC.
- NEW NEW
- NOT TO SCALE NOT TO SCALE
- POLE POLE
- POWER FACTOR POWER FACTOR
- PRIMARY PRIMARY
- POLYVINYL CHLORIDE POLYVINYL CHLORIDE
- POWER POWER
- RELOCATED RELOCATED
- RECEPTACLE RECEPTACLE
- RIGID GALVANIZED STEEL CONDUIT RIGID GALVANIZED STEEL CONDUIT
- RIGID METAL CONDUIT RIGID METAL CONDUIT
- SECONDARY SECONDARY
- SHORT-CIRCUIT CURRENT RATING SHORT-CIRCUIT CURRENT RATING
- SURGE PROTECTION DEVICE SURGE PROTECTION DEVICE
- SUPPLY SIDE BONDING JUMPER SUPPLY SIDE BONDING JUMPER
- SWITCH SWITCH
- SSBG SSBG
- SW SW
- TYP TYP
- V VOLT
- VOLT-AMPERE VOLT-AMPERE
- WATT WATT
- WEATHERPROOF WEATHERPROOF
- TRANSFORMER TRANSFORMER
- XFBM XFBM

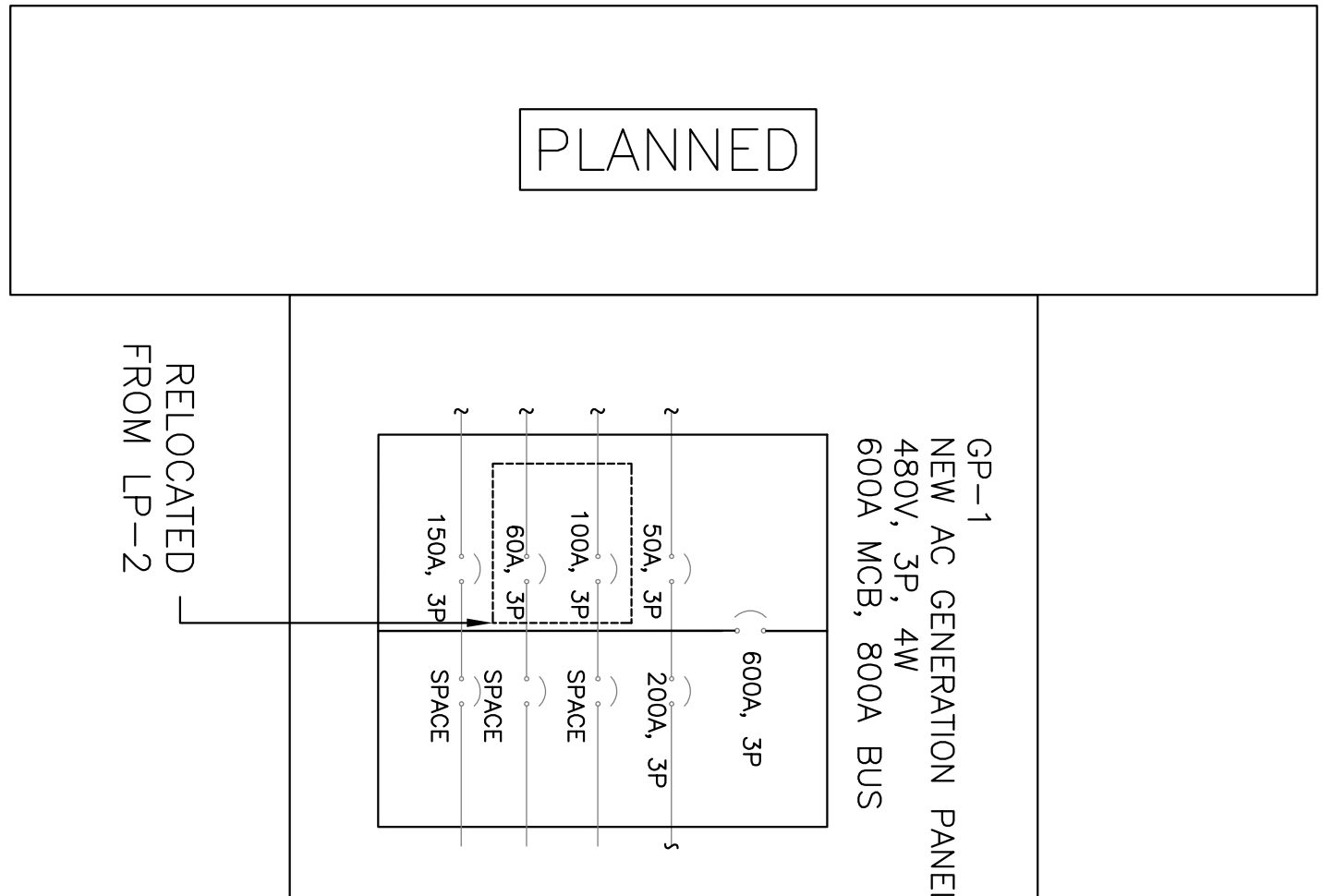
SHEET INDEX

SHEET NO.	SHEET TITLE	ISSUE
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E002	SPECIFICATIONS	
E100	SITE PLAN	
E200	ELECTRICAL ONE LINE DIAGRAM	
E300	CALCULATIONS	
E400	ELEVATIONS	
E401	DETAILS	

2023-04-13 PERMIT SET

New AC Generation Panel "GP-600" Schedule

Voltage Pry/Wire Amp Rating	3P/4W	800	Fed From		Type		Location		Mounting		Conduit	Pri. A	Pri. B	Pri. C	Conduit	Wire	OCPD	Load Type	CCT No.
			XFMR [500kVA,3P]	MCB	Manufacturer/Model	Square D / I-Line HCN14654M	Location	Mounting	Inside/Surface	Note: 600A MCB, New loads and existing loads relocated from Panel "AH".									
1	AC Test Bed	50	(4) #6 W/G	1"	X						2"	(3) 3/0 W/G	200	DynPower Inverter	2				
3	"	"	"	"	X										4				
5	"	"	"	"	X										6				
7	ORC Generator	100	(4) #1 W/G	1-1/2"	X										8				
9	"	"	"	"	X										10				
11	"	"	"	"	X										12				
13	Gas Generator	60	(4) #4 W/G	1-1/4"	X										14				
15	"	"	"	"	X										16				
17	"	"	"	"	X										18				
19	AC Load Bank	150	(4) 1/0 W/G	2"	X										20				
21	"	"	"	"	X										22				
23	"	"	"	"	X										24				



PLANNED



GENERAL ELECTRICAL NOTES:

GENERAL

1. THE WORD "PROVIDE" RELATIVE TO ELECTRICAL WORK, SHALL HEREAFTER BE INTERPRETED AS "FURNISH, INSTALL AND CONNECT".
2. UNLESS NOTED OTHERWISE, ALL EQUIPMENT FURNISHED BY THE CONTRACTOR SHALL BE NEW AND A MANUFACTURER'S DOCUMENT SHALL ACCOMPANY EACH MAJOR COMPONENT. PROVIDE EQUIPMENT MANUFACTURER'S LETTER OF WARRANTY.
3. CONTRACTOR SHALL PROVIDE COMPLETE AND WORKABLE SYSTEMS. ELECTRICAL DRAWINGS SERVE AS WORKING DRAWINGS FOR GENERAL LAYOUT OF VARIOUS ITEMS OF EQUIPMENT; HOWEVER, LAYOUT OF THE EQUIPMENT, ACCESSORIES, SPECIALTIES, DEVICES, AND OTHER TRADES ARE DIAGRAMMATIC UNLESS SPECIFICALLY DIMENSIONED. ELECTRICAL DRAWINGS DO NOT NECESSARILY INDICATE EVERY REQUIRED ITEM.
4. THE WORK COVERED BY THE CONSTRUCTION DOCUMENTS AND THE PROJECT SPECIFICATIONS CONSISTS OF FURNISHING THE LABOR, MATERIAL, AND EQUIPMENT IN PERFORMING THE OPERATIONS NECESSARY FOR THE INSTALLATION OF THE ELECTRICAL SYSTEMS INDICATED ON THE DRAWINGS AND/OR DESCRIBED IN THE SPECIFICATIONS. ANY INCIDENTAL WORK NOT SHOWN OR SPECIFIED, BUT WHICH IS BELONGING TO THE VARIOUS SYSTEMS SHALL BE INCLUDED. SATISFACTORY COMPLETION AND OPERATION OF THE VARIOUS SYSTEMS SHALL BE COORDINATED WITH THE REQUIREMENTS OF THE OTHER DIVISIONS AND WITH THE DRAWINGS FOR THE WORK COVERED UNDER THESE DOCUMENTS AND SPECIFICATIONS SHALL BE FOR THE SPECIAL KNOWLEDGE OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SPECIAL KNOWLEDGE TO WORK SHALL BE ACCEPTED. THE CONTRACTOR SHALL PROVIDE THE ELECTRICAL EQUIPMENT AND MATERIALS AS REQUIRED FOR COMPLETE AND OPERATIONAL SYSTEMS. REFER TO THE PROJECT SPECIFICATIONS FOR SUBMITTAL AND SHOP DRAWING REQUIREMENTS.
5. WORK AND MATERIALS SHALL BE IN FULL ACCORDANCE WITH THE CURRENT NATIONAL ELECTRIC CODE AND STATE AND LOCAL CODES THAT APPLY.
6. THE CONTRACTOR SHALL TAKE OUT PERMITS, PROCURE CERTIFICATES, AND PAY FEES AS REQUIRED TO PERFORM THE PROJECT ELECTRICAL WORK.
7. THE CONTRACTOR SHALL TOUCH-UP OR REFINISH THE FACTORY FINISH OF EQUIPMENT MARRED DURING SHIPMENT OR INSTALLATION.
8. THE CONTRACTOR SHALL BE A LICENSED ELECTRICIAN OF THE STATE IN WHICH THE WORK IS TO BE PERFORMED.
9. NO INTERRUPTION OF THE BUILDING FUNCTIONS OR ELECTRIC SERVICE SHALL BE PERMITTED WITHOUT APPROVAL OF THE TENANT.
10. AT THE COMPLETION OF THE WORK, THE CONTRACTOR SHALL REMOVE RUBBISH AND DEBRIS CAUSED BY THE CONTRACTOR AND SHALL THOROUGHLY CLEAN ALL ELECTRICAL EQUIPMENT AND COMPONENTS.
11. ELECTRICAL EQUIPMENT SHALL BE SPECIFICATION GRADE, UNLESS NOTED OTHERWISE.
12. ELECTRICAL ROOM EQUIPMENT LAYOUT IS CONCEPTUAL AND IS BASED ON DIMENSIONS OF INDUSTRY STANDARD EQUIPMENT. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO PROVIDE EQUIPMENT LAYOUT PER NEC ARTICLE 110 AND SIZED TO MEET THE ROOM DIMENSIONS. ELECTRICAL CONTRACTOR SHALL ADJUST THE EQUIPMENT LAYOUT IN THE FIELD AS NEEDED PER THE SUCCESSFUL MANUFACTURER'S EQUIPMENT DIMENSIONS (TYPICAL FOR ALL ELECTRICAL EQUIPMENT ROOMS). PRIOR TO ROUGH-IN AND RACEWAY INSTALLATION, ELECTRICAL CONTRACTOR SHALL SUBMIT DIMENSIONED LAYOUT OF EQUIPMENT ROOMS AND ELECTRICAL ROOMS UTILIZING DIMENSIONS OF EQUIPMENT TO BE INSTALLED. SUBMIT FOR REVIEW PRIOR TO ANY FIELD WORK.
13. EQUIPMENT, FINISHES, AND ACCESSORIES TO BE PROVIDED SHALL COMPLY WITH ANSI A117.1, AMERICANS WITH DISABILITIES ACT AND OTHER SPECIFIC STANDARDS, CODES AND REGULATIONS ESTABLISHED BY LOCAL AUTHORITIES HAVING JURISDICTION.
14. CUTTING AND PATCHING: THE CONTRACTOR SHALL PERFORM WHERE REQUIRED TO FACILITATE CONSTRUCTION. THE CONTRACTOR SHALL PATCH AND REPAIR SUCH OPENINGS TO THE ORIGINAL STATE, HOWEVER, STRUCTURAL ELEMENTS SHALL NOT BE CUT WITHOUT THE WRITTEN APPROVAL OF THE ARCHITECT OR HIS REPRESENTATIVE.
15. THE CONTRACTOR SHALL PROTECT HIS WORK DONE UNDER THIS CONTRACT FROM INJURY DURING CONSTRUCTION AND PROTECT HIS EQUIPMENT FROM DAMAGE.
16. THE CONTRACTOR SHALL NOTIFY THE ELECTRIC OF NEW WORK FOR THIS PROJECT. THE CONTRACTOR SHALL ARRANGE WITH THE ELECTRIC AND TELEPHONE UTILITY COMPANIES TO PROVIDE SERVICE AND EQUIPMENT PER UTILITIES REQUIREMENTS. INCLUDE COSTS IN THE BASE BID.
17. ELECTRICAL EQUIPMENT AND APPURTENANCES UNDER THIS CONTRACT SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF THE LATEST EDITION OF THE FOLLOWING PUBLICATIONS:
 - A) UNDERWRITER'S LABORATORIES, INC. – U.L.
 - B) NATIONAL FIRE PROTECTION ASSOCIATION – NFPA
 - C) NATIONAL ELECTRICAL MANUFACTURER'S ASSOC. – NEMA
 - D) NATIONAL ELECTRICAL CODE – NEC
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES, AND FOR SAFETY PRECAUTIONS AND PROGRAMS.
19. THE CONTRACTOR SHALL FURNISH A WRITTEN, SIGNED WARRANTY STATING:
 - A) THAT WORK EXECUTED UNDER THIS CONTRACT SHALL BE FREE OF DEFECTS IN WORKMANSHIP AND MATERIAL FOR A PERIOD OF ONE (1) YEAR FROM DAY OF FINAL ACCEPTANCE.
 - B) THAT THE ELECTRICAL CONTRACTOR WILL AT HIS OWN EXPENSE REPAIR OR REPLACE DEFECTIVE WORK AND MATERIALS AND OTHER WORK DAMAGED THEREBY, WHICH BECOMES DEFECTIVE DURING THE TERM OF THE GUARANTEE-WARRANTY.

DEMOLITION

1. NECESSARY MODIFICATIONS AND ADJUSTMENTS TO NEW ELECTRICAL ITEMS AND EQUIPMENT SHALL BE MADE AS MAY BE REQUIRED BY THESE ADDITIONS. CAREFUL INSPECTION OF THE PLANS AND SITE IS REQUIRED, AS THE PLANS DO NOT INDICATE ALL SUCH ELECTRICAL ITEMS AND EQUIPMENT.

GROUNDING

1. ALL PROJECT GROUNDING SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE.

GENERAL ELECTRICAL NOTES

2. PROVIDE A COMPLETE GROUNDING SYSTEM, GROUND CONDUCTOR, GROUND ELECTRODES, GROUND BUS, AND GROUND ROD TO EFFECTIVELY PROVIDE SERVICE GROUND, GROUND PANELS, WIREWAYS, CONDUITS, LIGHT FIXTURES, RECEPTACLES, AND EQUIPMENT IN ACCORDANCE WITH THE NEC. VERIFY GROUNDING MEANS.
3. GROUND CONDUCTORS SHALL BE PROVIDED IN FEEDERS AND BRANCH CIRCUIT RACEWAYS. EQUIPMENT GROUND WIRES SHALL BE COPPER AND SIZED AS PER NEC TABLE 250.122. RACEWAYS, BOXES, AND CONDUITORS
 1. WIRING INCLUDING LOW VOLTAGE SHALL BE IN CONDUIT WHERE REQUIRED BY THE AUTHORITY HAVING JURISDICTION.
 2. PROVIDE PULL BUSHINGS ON COMMUNICATIONS RACEWAYS.
 3. USE ONLY APPROVED LUBRICANT FOR WIRE PULLING PURPOSES.
 4. WHERE RACEWAYS AND CABLE PASS THROUGH CONCRETE OR CONCRETE BLOCK WALLS, PROVIDE CORE DRILLING AS REQUIRED.
 5. ITEMS OF ELECTRICAL EQUIPMENT ASSOCIATED WITH THE CONTROL OF ELECTRICAL APPARATUS SHALL BE IDENTIFIED. IN UNFINISHED AREAS PAINT STENCIL SHALL BE ACCEPTABLE. FOR OTHER AREAS AN ENGRAVED PLATE SHALL BE USED TO IDENTIFY ASSOCIATED EQUIPMENT.
 6. NOMINAL MOUNTING HEIGHT OF DEVICES IN EXPOSED CONCRETE BLOCK, TILE, OR BRICK WALLS SHALL OCCUR WITHIN A SINGLE COURSE. A MINIMUM AMOUNT OF BLOCK, TILE, OR BRICK SHALL BE CUT.
7. CONTRACTOR SHALL RUN RACEWAY CONCEALED WHEN POSSIBLE. CONCEALED RACEWAYS SHALL BE RUN IN AS DIRECT A LINE AS POSSIBLE WITH LONG BENDS. EXPOSED RACEWAYS SHALL BE RUN PARALLEL TO OR AT RIGHT ANGLES TO THE LINES OF THE BUILDING. RACEWAYS SHALL BE SUPPORTED FROM BUILDING SUPPORTING MEMBERS, ABOVE SUSPENDED CEILINGS, SUPPORT FROM MECHANICAL SYSTEM PIPING, DUCTS, AND OTHER TRADES ARE NOT ACCEPTABLE.
8. PROVIDE LIQUID-TIGHT FLEXIBLE CONDUIT FOR CONNECTION OF MOTORS AND FOR OTHER ELECTRICAL EQUIPMENT WHERE SUBJECT TO MOVEMENT, VIBRATION, AND ALSO WHERE SUBJECT TO ANY OF THE FOLLOWING: EXTERIOR, MOISTURE, CORROSIVE ATMOSPHERE.
9. SHEET METAL BOXES SHALL BE STANDARD TYPE WITH KNOCKOUTS, MADE OF HOT DIPPED GALVANIZED STEEL AS MANUFACTURED BY STEEL CITY, RACO, OR APPROVED EQUIVALENT.
10. CIRCUIT CONDUCTORS SHALL BE 2 #12 & 1 #12 EQUIPMENT GROUND, UNLESS NOTED OTHERWISE.
11. CONDUCTORS SHALL BE CONTINUOUS FROM DEVICE TO DEVICE. AVOID UNNECESSARY SPLICING.
12. NUMBER OF WIRES FOR EACH CIRCUIT MAY NOT BE INDICATED ON DRAWINGS. THE CONTRACTOR SHALL PROVIDE WIRES NECESSARY FOR PROPER FUNCTION OF THE SYSTEM WHETHER INDICATED ON PLANS OR NOT.
13. RACEWAYS SHALL BE 90 DEGREE WHERE PENETRATING FIRE OR SMOKE RATED WALLS SO THEY CAN BE PROPERLY FIRE TREATED AND CALKED. PROVIDE MINIMUM 2-HOUR RATED CALDKING.
14. PENETRATIONS THROUGH FIRE RATED FLOORS, WALLS, OR CEILINGS SHALL BE FIRE SEALED WITH "COR-RIV" HIGH-TEMPERATURE SILICONE FOAM (OR APPROVED EQUIVALENT) TO MAINTAIN FIRE RATING. VERIFY SEALANT COMPATIBILITY WITH SUBSTRATE.
15. PATCH FLOOR PENETRATIONS WITHIN PROJECT AREA AS REQUIRED TO MAINTAIN 2-HOUR FLOOR SEPARATION.
16. SINGLE-PHASE BRANCH CIRCUITS, 120-VOLT LIGHTING, RECEPTACLES, AND MOTORS SHALL CONSIST OF PHASE, NEUTRAL, AND GROUND CONDUCTORS.
17. JUNCTION BOXES AND ELECTRICAL EQUIPMENT EXPOSED TO THE ELEMENTS SHALL BE WEATHERPROOF.
18. CONDUIT CROSSING EXPANSION JOINTS SHALL HAVE EXPANSION TYPE FITTINGS ON BOTH SIDES OF EXPANSION JOINT.

PANELBOARDS

1. PANELBOARDS SHALL CONSIST OF COMPLETE DEAD FRONT ASSEMBLIES INCLUDING BACK CAN, BUS BAR, SHEET METAL CABINET, SWITCHING AND OVER CURRENT DEVICES, TRIMS, DOOR AND LOCK. PANELBOARDS SHALL BE SQUARE "D", C.E., SIEMENS OR APPROVED EQUIVALENT.

2. WHEN ORDERING PANELBOARDS, THE CONTRACTOR SHALL DETERMINE THE NUMBER OF SERVICE ENTRANCE CONDUCTORS, SIZE AND MATERIAL TYPE, AND SHALL PROVIDE THIS INFORMATION TO THE PANELBOARD SUPPLIER SO THAT THE APPROPRIATE LUGS CAN BE PROVIDED FROM THE FACTORY.

3. THE CONTRACTOR SHALL INSTALL PANELS AND ELECTRICAL EQUIPMENT PER NEC ARTICLE 110 CLEARANCE REQUIREMENTS.

4. PROVIDE DEDICATED CIRCUIT(S) AND "LOCK OUT BREAKER(S)" FOR NIGHT LIGHTING, EXIT LIGHTS, AND EMERGENCY LIGHTS, OUTLET(S) AT TELEPHONE BACKBOARD, AND FIRE ALARM LEADS CIRCUITS. PROVIDE "RED" COLOR CIRCUIT BREAKER.

5. CIRCUIT NUMBERS ARE FOR IDENTIFICATION ONLY. THE CONTRACTOR WILL BE RESPONSIBLE FOR CORRECTLY PHASING THE CIRCUITS IN THE PANELS. HOMERUNS OF SIMILAR SINGLE-PHASE CIRCUITS MAY BE COMBINED IN ANY ONE RACEWAY WITH A COMMON NEUTRAL, UNLESS NOTED OTHERWISE. ONLY THREE (3) SINGLE-PHASE CIRCUITS MAY BE COMBINED IN ANY ONE RACEWAY. ON COMPLETION OF THE SPACE, THE ELECTRICAL CONTRACTOR SHALL BALANCE THE PANEL PHASE LOADS TO WITHIN TEN PERCENT.

WIRING DEVICES

1. PLATES FOR UNFINISHED AREAS SHALL BE SHEET STEEL OR CAST METAL.

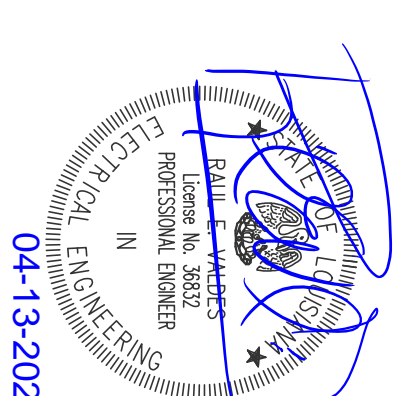
2. SAFETY SWITCHES SHALL BE INSTALLED WHERE INDICATED ON PLANS OR WHERE OTHERWISE REQUIRED BY CODE ENFORCING AUTHORITIES. THEY SHALL BE INSTALLED WITH ADEQUATE HAND ACCESS TO AND CLEARANCE FOR OPERATION AND FUSE REPLACEMENT. EACH SWITCH SHALL HAVE ENGRAVED PLASTIC NAMEPLATES INSTALLED, IDENTIFYING THE EQUIPMENT IT IS SERVICING.

3. REMOTE POWERED EQUIPMENT ON ROOF OR GROUNDS SHALL BE PROVIDED BY CONTRACTOR WITH A NEMA 3R DISCONNECT SWITCH AT EACH PIECE OF EQUIPMENT (UNLESS NOTED OTHERWISE).



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ENGINEER



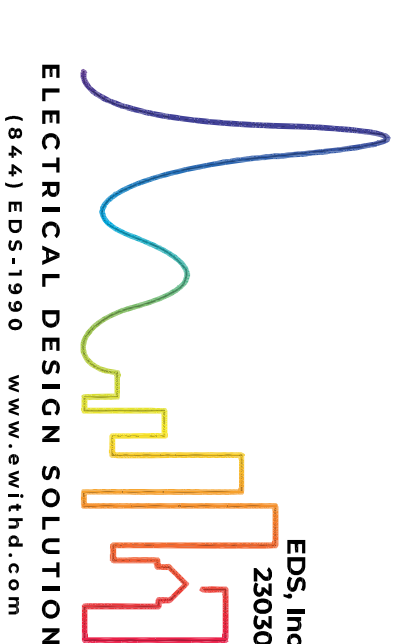
General Notes
 MICROGRID SYSTEM
 WITH GROUND MOUNT PV

Revisions		
No.	Issue	Date

Project Name and Address

UNIVERSITY OF LOUISIANA
 AT LAFAYETTE-CLECO
 POWER 2008 HUTCHINSON
 AVE CROWLEY, LA 70526

Drawn By	DAE	Sheet	E001
Date	04/13/2023		
Scale	N/A		



ELECTRICAL SPECIFICATIONS:

GENERAL

- ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE 2020, STATE AND CITY REGULATIONS AND ORDINANCES.
- UNLESS INDICATED OTHERWISE, WORK INDICATED IN THE CONSTRUCTION DOCUMENTS SHALL BE PERFORMED BY THE CONTRACTOR.
- MATERIALS SHALL BE NEW AND APPROVED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) TO UNDERWRITERS LABORATORIES (UL) STANDARDS, EXCEPT AS INDICATED.
- CONTRACTOR SHALL APPLY FOR PERMITS AND PAY INSPECTION FEES.
- UNLESS APPROVED BY LOCAL INSPECTOR, NO WORK SHALL BE CONCEALED.
- UPON COMPLETION, FURNISH CERTIFICATE OF APPROVAL FROM DIVISION OF REGULATORY INSPECTION AS APPLICABLE.
- CUTTING SHALL BE DONE BY CONTRACTOR, NO CUTTING OF STRUCTURAL MEMBERS SHALL BE DONE WITHOUT PERMISSION OF THE ARCHITECT.
- PATCH AND FINISH ANY HOLES CUT. FINISH SHALL MATCH OTHER EXISTING FINISHES.
- PATCH, FLASH, AND COMPLETELY WATERPROOF ANY HOLES CUT IN EXTERIOR WALLS. PROVIDE GROUTING AROUND RACEWAY PENETRATIONS THROUGH CONCRETE FLOORS EQUAL TO THE FIRE RATING OF THE FLOOR USING NON-SHRINKING WATERPROOF GROUT.
- REPAIR AND/OR REPAIR WALLS, CEILINGS, AND FLOORS WHERE EXISTING EQUIPMENT IS REMOVED. MAKE DAMAGE TO FINISHED SURFACES SHALL BE REPAIRED BY CONTRACTOR AT HIS/HER OWN EXPENSE.
- COORDINATE DEMOLITION OF EXISTING WORK WITH OTHER DISCIPLINES.
- THE BIDDER SHALL VISIT THE SITE OF PROPOSED WORK SO THAT HE MAY BE AWARE OF ALL EXISTING UTILITIES AND CONDITIONS THAT MAY AFFECT THE EXECUTION OF THE CONTRACT. HE WILL BE ALLOWED NO ADDITIONAL COMPENSATION FOR FAILURE TO BE SO INFORMED.
- WITHIN 30 DAYS AFTER AWARD OF CONTRACT, CONTRACTOR SHALL SUBMIT FOR REVIEW DESCRIPTIVE LITERATURE OR SHOP DRAWINGS FOR WIRING DEVICES AND PLATES, CONDUCTORS AND WIRING, FUSES, SAFETY SWITCHES, LUMINAIRES, [FIRE ALARM EQUIPMENT, COMMUNICATIONS EQUIPMENT], AND DISTRIBUTION EQUIPMENT.
- INSTALLER/SUBCONTRACTOR SHALL HAVE A MACEP BY TECHNICAL CERTIFICATION OR EQUIVALENT, AND SHOULD HAVE SUCCESSFULLY COMPLETED AT LEAST TWO OTHER NON RESIDENTIAL SOLAR PV PROJECTS OF EQUAL OR GREATER SIZE AND COMPLEXITY.
- ALL WORK SHALL BE INSTALLED IN A FIRST CLASS AND NEAT MANNER BY THOSE SKILLED IN THE TRADE INVOLVED. ALL DETAILS OF THE INSTALLATION SHALL BE ELECTRICALLY AND MECHANICALLY CORRECT.
- TORQUE AND MARK ALL RACKING AND MECHANICAL LUGS.
- ALL NEW EQUIPMENT SHALL HAVE AN INTERRUPT RATING (KALC) GREATER THAN OR EQUAL TO THE EXISTING EQUIPMENT.
- THE GENERAL NOTES APPLY TO ALL SOLAR-RELATED "S" NUMBERED DRAWINGS UNDER THE CONTRACT. REFER TO INDIVIDUAL DRAWINGS FOR ANY ADDITIONAL NOTES.
- THE DRAWINGS INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK FOLLOW DRAWINGS IN LAYING OUT WORK AND VERIFY SPACE CONDITIONS, MAINFAN HEADROOM, WORKING CONDITIONS, AND REQUIRED CLEARANCES.
- THE PV SYSTEM CONTRACTOR SHALL COORDINATE ALL WORK WITH THE ENGINEER, THE CONSTRUCTION MANAGER, AND ANY OTHER CONTRACTORS TO ENSURE THAT THE PV SYSTEM IS INSTALLED AS SPECIFIED IN THESE DRAWINGS.
- PERSONAL PROTECTIVE EQUIPMENT (PPE) SHALL BE USED IN ACCORDANCE WITH NFPA 70E AND OSHA REQUIREMENTS.
- UNOBTAINED OBSTRUCTIONS ON THE ROOF MAY REQUIRE A CHANGE TO THE ARRAY LAYOUT. CHANGES TO THE ARRAY LAYOUT SHOULD BE MADE AS TO NOT CHANGE THE NUMBER OF MODULES ON A INVERTER.
- RESTORE LANDSCAPING TO MATCH PREVIOUSLY EXISTING CONDITIONS.
- THE CONTRACTOR SHALL PROVIDE A FENCE ENCLOSING THE NEW PHOTOVOLTAIC ARRAYS.
- PROCEDURES SHALL BE IN PLACE TO ALLOW ONLY QUALIFIED AND TRAINED PERSONNEL TO WORK ON THE AC LOAD BANK.

DEMOLITION

- REFER TO THE DEMO PACKAGE FOR THE EXTENT OF DEMOLITION.
- SERVICES IN EXISTING BUILDINGS ARE TO BE KEPT IN OPERATION AT ALL TIMES. BEFORE ANY STRUCTURAL DEMOLITION IS GIVEN TO DO OTHERWISE, BEFORE ANY STRUCTURAL DEMOLITION, THE CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION TO DO THIS WORK AT A TIME MOST CONVENIENT TO THE OCCUPANTS. THIS PROCEDURE MAY INVOLVE WORKING AT NIGHT, ON SATURDAY OR SUNDAY, WITH THE LENGTH OF THE INTERRUPTION AGREED UPON IN ADVANCE. ALLOWANCE SHALL BE MADE IN CONTRACTOR'S BID FOR THE COST OF ANY OVERTIME WORK IN THIS CONNECTION.
- ELECTRICAL EQUIPMENT REMOVED AND NOT TO BE RE-USED SHALL BE STORED ON THE SITE. CONTRACTOR SHALL REMOVE ANY EQUIPMENT WHICH OWNER DOES NOT WANT.

CONDUCTORS AND CABLES

- CONDUCTORS SHALL BE COPPER MATERIAL, TYPE SOUTHWIRE, ROWE, AMERICAN OR APPROVED EQUIVALENT.
- CONDUCTORS SHALL HAVE TYPE THHN/THWN-2 INSULATION.
- CONDUCTORS SMALLER THAN #1 SHALL BE COPPER. CONDUCTORS #1 AND LARGER MAY BE ALUMINUM OR COPPER.
- ALUMINUM CONDUCTORS SHALL BE SERIES AA-8000.
- TYPE MC CABLE SHALL BE ALLOWED IN APPLICATIONS ALLOWED PER NEC AND WHERE CONCEALED.
- WHERE ALUMINUM CONDUCTORS ARE USED, CONTRACTOR SHALL VERIFY THAT SPLICES AND TERMINATIONS ARE APPROVED FOR THE USE OF ALUMINUM CONDUCTOR.
- CONDUCTOR SIZES INDICATED ON DRAWINGS ARE PER COPPER CONDUCTOR RATINGS. IF CONTRACTOR ELECTS TO USE ALUMINUM CONDUCTORS, CONTRACT SHALL RESIZE CONDUITS TO ACCOMMODATE ALUMINUM CONDUCTORS.

SPECIFICATIONS

- DRAWINGS INDICATE CIRCUITS BY NAMING PANEL AND CIRCUIT NUMBER NEXT TO DEVICE. PROVIDE WIRING AND RACEWAY AS NECESSARY TO CONNECT SUCH DEVICES TO EACH CIRCUIT.
- CONDUCTORS SHALL BE IDENTIFIED PER NEC 690.31(B).
- THHN/THWN-2 INSULATION IS ACCEPTABLE FOR ALUMINUM MC CABLE. FOR ALUMINUM CONDUCTORS XHHW-2 SHALL BE USED.
- STRING WIRING AND HOOKUPS SHALL BE SECURED TO THE UNDERSIDE OF THE MODULES AND RACKING USING SUBMINOR-TYPE PVC COATED STAINLESS TIES OUTDOOR RATED FOR UV, OUTSIDE OF ARRAY, TRANSITION TO EMT CONDUIT.
- THE USE OF WIRE SPLICES IS PROHIBITED EXCEPT IN ORDER TO RELOCATE LP-1. WIRE SPLICING SHALL BE DONE FOLLOWING THE PROPER MANUFACTURER'S INSTALLATION MANUAL, AND ITS RECOMMENDED BEST PRACTICES. THE MATERIAL USED FOR SPLICING THE WIRES MUST MATCH OR EXCEED IN AMPACITY, VOLTAGE, AND KVIC IN ALL ITS TERMINALS THE MAXIMUM VALUES OF ALL THE WIRES THAT WILL BE CONNECTED.
- WIRE LUBE IS REQUIRED FOR WIRE PULLS THROUGH CONDUIT RUNS OF 20' OR LONGER FOR WITH BENDS IN 180° OR MORE. WIRE LUBE IS REQUIRED EVEN WHEN USING SELF LUBRICATING CABLES.
- COMPRESSION LUGS SHALL BE USED ON ALL ALUMINUM CABLE TERMINATIONS. MECHANICAL LUGS MAY ONLY BE USED FOR COPPER CABLE TERMINATIONS.
- NOALOX TO BE USED WITH ALL ALUMINUM LUGS.
- INSTALL WIRE AND CABLE IN ACCORDANCE WITH THE NEC, THE NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION'S (NECA) "STANDARD OF INSTALLATION," AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. THE INSTALLATION SHALL BE IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES AND THE LOCAL AUTHORITY HAVING JURISDICTION.
- CONNECT FEEDERS TO PRESERVE PHASE RELATIONSHIP THROUGHOUT THE SYSTEM. PHASE LEGS OF FEEDERS SHALL MATCH BUS OR CABLE ARRANGEMENTS FOR ALL CONNECTED EQUIPMENT. COLOR CODING SHALL BE AS FOLLOWS:
-600 VDC OR 1000 VDC: UNGROUND NEGATIVE CONDUCTOR: RED
-AC AND DC SYSTEMS: GROUND/ GREEN
GROUND/ CONDUCTOR: WHITE
-208/120 VAC A PHASE: BLACK, B PHASE: RED, C PHASE: BLUE
-277/480 VAC A PHASE: BROWN, B PHASE: ORANGE, C PHASE: YELLOW
COLOR CODING MUST BE USED CONSISTENTLY FOR THE ENTIRE PROJECT. WHERE COLOR CODED CABLE IS NOT USED, TAPE CONDUCTOR WITH OVERLAPPING COLORED TAPE.

RACEWAYS AND BOXES

- WIRING SHALL BE CONTAINED IN ELECTRIC METALLIC TUBING WITH STEEL COMPRESSION FITTINGS CONNECTORS, UNLESS INDICATED OTHERWISE.
- RACEWAYS SHALL BE CONCEALED UNLESS INDICATED OTHERWISE.
- WIRING INSTALLED UNDERGROUND SHALL BE CONTAINED IN RMC OR IMC.
- WIRING INSTALLED UNDERGROUND OR IN FILL BENEATH BUILDING SLABS SHALL BE CONTAINED IN PVC SCHEDULE 40 RACEWAYS.
- CONDUITS UNDER STRUCTURAL SLABS SHALL BE SUPPORTED FROM THE SLABS USING 1/4" STAINLESS STEEL ROOLS.
- PROVIDE LIQUID-TIGHT FLEXIBLE CONDUIT FOR CONNECTION OF MOTORS AND FOR OTHER ELECTRICAL EQUIPMENT WHERE SUBJECT TO MOVEMENT, VIBRATION, AND ALSO WHERE SUBJECT TO ANY OF THE FOLLOWING: EXTENSION, MOISTURE, CORROSION, AND/OR OTHER.
- RACEWAYS SHALL BE A MINIMUM OF 3/4" DIAMETER UNLESS OTHERWISE NOTED. DRAWINGS SHOW RACEWAY LOCATIONS, BUT CONTRACTOR MAY ADJUST TO SUIT FIELD LOCATIONS.
- CONDUIT ELBOWS SHALL BE OF THE SAME MAKE, QUALITY, AND FINISH AS THE CONDUIT USED.
- APPLY TWO PROTECTIVE COATS OF ASPHALTUM COMPOUND FOR ANY GALVANIZED STEEL CONDUITS DIRECTLY BURIED IN EARTH.
- PROVIDE EXPANSION FITTINGS WITH BONDING JUMPERS FOR EVERY 100' OF STRING CONDUIT RUN. BONDING AND DIELECTRIC FITTINGS WITH BONDING JUMPERS SHALL BE USED WHENEVER CROSSING BUILDING EXPANSIONS.
- LEAVE WIRE SUFFICIENTLY LONG TO PERMIT MAKING FINAL CONNECTIONS.
- EMT CONDUIT SHALL USE PROPERLY INSTALLED, FACTORY-STAMPED RAIN-TIGHT COMPRESSION CONNECTORS.
- RACEWAY SIZES SHALL BE NO LESS THAN 3/4" IN DIAMETER. PVC CONDUITS SHALL BE SCHEDULE 80.
- ALL ROOFTOP CONDUIT SHALL BE MARKED PER LOCAL FIRE CODES.
- A BUCKET 15" WIDE OR LESS SHALL BE USED FOR TRENCHING.
- INDOOR ELECTRICAL ENCLOSURES SHALL BE RATED NEMA 3R, 4, OR 4X. INDOOR ENCLOSURES SHALL BE RATED NEMA 1. ALL ELECTRICAL EQUIPMENT SHALL BE LISTED OR LABELED BY A RECOGNIZED TESTING AGENCY.
- PENETRATIONS OR CABLE ENTRIES IN THE TOP OF OUTDOOR ENCLOSURES ARE NOT PERMITTED. ENTER OUTDOOR ENCLOSURES FROM THE BOTTOM OR SIDE.
- CONDUIT TERMINATING IN OUTDOOR ENCLOSURES SHALL USE METERS-TYPE HUBS INCLUDING A GROUND SCREW. USE RAIN TIGHT FITTINGS FOR ALL CABLE ENTRIES.
- HANDHOLES, PULL BOXES, OR CONDUIT RUNS SHALL BE INSTALLED WHEN THE RACEWAY HAS MORE THAN 360° OF BENDS, OR AS NECESSARY TO NOT EXCEED MANUFACTURER'S MAXIMUM CABLE PULLING TENSION.

GROUNDING AND BONDING

- THE METALLIC RACEWAY SYSTEM AND THE NEUTRAL CONDUCTOR OF THE WIRING SYSTEM SHALL BE GROUNDED AT THE SERVICE EQUIPMENT. THE INSULATED COPPER SERVICE GROUNDING ELECTRODE CONDUCTOR SHALL BE EXTENDED WITH NO SPLICES IN RACEWAY FROM THE SERVICE TO WITHIN 5 FEET OF THE POINT OF ENTRANCE OF THE METAL UNDERGROUND WATER SERVICE PIPE THAT IS ELECTRICAL CONTINUOUS WITH THE SERVICE. THE SERVICE SHALL BE AT LEAST 1/2" FEET ABOVE THE RAIN PIPING. FINISHED CABLES IT SHALL BE RUN CONCEALED. GROUND CONNECTION SHALL BE VISIBLE, AND CONNECTION

- OF RACEWAY AND CONDUCTOR TO THE WATER PIPE SHALL BE MADE WITH AN APPROVED GROUND CONNECTOR SIMILAR TO T & B CONDUIT HUB AND WATER PIPE CLAMP. ALSO, SEE ARTICLE 250.50, GROUNDING ELECTRODE SYSTEM AND GROUNDING ELECTRODE CONDUCTOR OF THE NATIONAL ELECTRICAL CODE FOR BONDING REQUIREMENTS TO OTHER ITEMS TO FORM THE GROUNDING ELECTRODE SYSTEM (THIS INCLUDES BONDING TO METAL FRAME OF BUILDING). THESE REQUIREMENTS SHALL BE SUPPLEMENTED BY GROUNDING TO A SET OF 2-3/4" DIAMETER BY 10' LONG COPPER CLAD GROUND RODS SPACED 10' APART.
- CONTRACTOR MAY USE EXISTING GROUND ROD SYSTEM IF IT COMPLES WITH NEC AND IEEE. PROVIDE MEASUREMENTS TO VERIFY.
- PROVIDE BONDING AROUND CONCENTRIC AND ECCENTRIC KNOCKOUTS ON EQUIPMENT.
- EACH BRANCH CIRCUIT AND FEEDER SHALL BE PROVIDED WITH A GROUND CONDUCTOR INSTALLED WITH THE CIRCUIT CONDUCTORS. EACH GROUND CONDUCTOR SHALL BE A GREEN INSULATED COPPER CONDUCTOR, SIZED IN ACCORDANCE WITH TABLE 250-122 OF THE NATIONAL ELECTRICAL CODE (NECA-70). THESE GROUNDING CONDUCTORS MAY NOT BE SHOWN ON THE DRAWINGS.
- THE CONTRACTOR SHALL INSTALL A GROUNDING ROD AT EACH DISTANT PV SOLAR ARRAY AND THE THEM TO THE EXISTING GROUNDING SYSTEM PER NEC.

POWER DISTRIBUTION

- SERVICE ENTRANCE EQUIPMENT SHALL BE SQUARED, GENERAL ELECTRIC, SIEMENS, OR EQUAL WITH ALUMINUM OR COPPER BUS, COPPER GROUND BUS, NEMA-3R RATING, BOND NEUTRAL TO GROUND IN SERVICE ENTRANCE EQUIPMENT.
- PANELBOARDS SHALL BE SQUARE D GENERAL ELECTRIC, SIEMENS, OR EQUAL WITH BOLT-ON BREAKERS, COPPER OR ALUMINUM BUS, COPPER GROUND BUS, DOOR BACKBOX, AND PHENOLIC NAMEPLATE (WHITE WITH BLACK-CUT LETTERS) ATTACHED WITH TWO SCREWS TO INDICATE PANELBOARD DESIGNATION.
- WHERE PANELBOARDS ARE INSTALLED FLUSH WITH WALLS, FEEDER RACEWAYS SHALL BE EXTENDED FROM THE PANELBOARD AND ACCESSIBLE LEADS SHALL BE SINGLE POLE SPARE CIRCUIT BREAKERS OR SPACES, OR FRACTION THEREOF, BUT NOT LESS THAN TWO RACEWAYS.
- LOAD CENTERS SHALL BE SURFACE MOUNTED, WITH COPPER OR ALUMINUM BUS, COPPER GROUND BUS, AND DOOR.
- AFTER COMPLETION OF BRANCH CIRCUIT WORK, NEW CORRECTED TYPEWRITTEN DIRECTORIES SHALL BE PROVIDED IN PANELBOARDS SERVING THE AREA.
- SAFETY SWITCHES SHALL BE SQUARE D, GENERAL ELECTRIC, SIEMENS, OR EQUAL, GENERAL DUTY FOR 208-240 VOLT NON-FUSED SWITCHES, AND HEAVY DUTY FOR 208-240 VOLT FUSED SWITCHES. SAFETY SWITCHES SHALL BE INSTALLED WITH A FUSIBLE SWITCHES SHALL HAVE CLASS R REJECTION FEATURE. EACH SHALL HAVE A PHENOLIC NAMEPLATE (WHITE WITH BLACK-CUT LETTERS) ATTACHED WITH TWO SCREWS TO IDENTIFY THE LOAD SERVED.
- FUSES SHALL BE BUSS LOW-PEAK TYPE RK-1, CURRENT LIMITING AND TIME DELAY, REJECTION TYPE.
- CIRCUIT BREAKERS, MOLDED CASE, THERMAL-MAGNETIC QUICK-MAKE, QUICK-BREAK TYPE WITH TRIP-FREE HANDLE, MULTI-POLE TYPE WITH INTERNAL COMMON TRIP BAR, CIRCUIT BREAKERS SHALL BE SWITCH RATED AND BOLT-ON TYPE.
- CIRCUIT BREAKERS FOR HVAC UNITS SHALL BE UL 489 LISTED OR BE HACR TYPE PER NEC.
- ON EVERY PANELBOARD, COMBINER BOX, TERMINAL BOX, INVERTER, AC AND DC SWITCH, TRANSFORMER, AND SWITCHGEAR, PROVIDE ARC FLASH HAZARD WARNING LABEL PER NEC.
- PANELBOARD DOORS SHALL BE QUARTER TURN LATCHES OR EXTERNAL HANDLE WITH INTERNAL LATCHES ONLY.

PV DEVICES

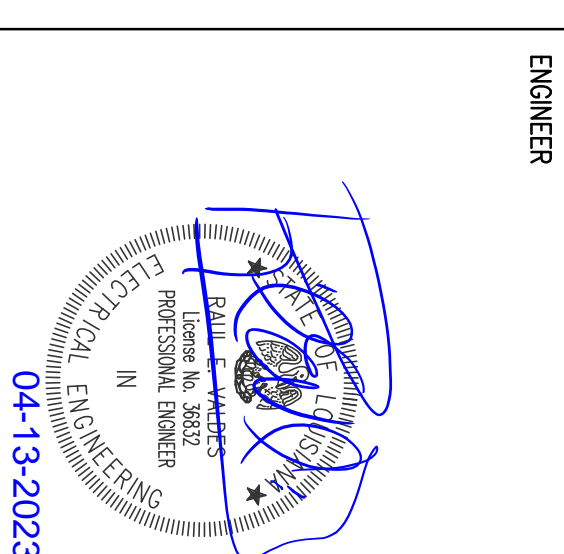
- ALL INVERTERS SHALL BE IEEE 1547 COMPLIANT AND BE INSPECTED BY THE LOCAL UTILITY BEFORE COMMISSIONING, TESTING, AND OPERATION.
- THE CONTRACTOR SHALL VERIFY THE UL CERTIFICATION OF THE SELECTED PV SOLAR RACKING SYSTEM FOR GROUNDING COMPLIANCE PRIOR TO INSTALLATION.
- THE CONTRACTOR SHALL FURNISH PLACARDS AND LABELS PER NEC REQUIREMENTS FOR ALL NEW SOLAR EQUIPMENT AND SITE DIRECTORIES ON ALL THE POWER GENERATION SOURCES INTERCONNECTION POINTS.

UTILITY INTERCONNECTION REQUIREMENTS

- HAVE A SINGLE LABELED MANUAL DISCONNECT FOR THE ENTIRE RENEWABLE FACILITY AT A SERVICE, APPROVED BY THE UTILITY ON THE OUTSIDE (AVAILABLE TO ENERGY24 HOURS A DAY WITH NO NOTICE).
- BE ABLE TO SYNCHRONIZE WITH THE UTILITY AND STAY SYNCHRONIZED.
- HAVE SAFETY MEASURES THAT PREVENT THE GENERATOR FROM FEEDING ELECTRICAL TO THE UTILITY WHEN THE LINE IS NON-ENERGIZED, OR IN AN ABNORMAL VOLTAGE OR FREQUENCY SITUATION OR CAUSE A DEGRADATION OF THE SAFETY OR QUALITY OF POWER ON THE ELECTRICAL GRID (I.E. UL1741 LISTED INVERTERS).
- OBTAIN ALL PERMITS REQUIRED BY LOCAL AUTHORITIES BEFORE THE NET METER CAN BE INSTALLED.
- FOR RENEWABLE GENERATORS IN EXCESS OF 300 KILOWATTS LOCATED AT A COMMERCIAL FACILITY, A SIGNED FINAL ORDER FROM THE LOUISIANA PUBLIC SERVICE COMMISSION APPROVING THE PROJECT MUST BE SUBMITTED.
- NOT BE IN THE DOWNTOWN UNDERGROUND NETWORK.

TESTS

- FINAL TESTS 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 TO INSURE QUALITY INSTALLATION AND SUBMIT RESULTS TO OWNER FOR REVIEW.



General Notes
MICROGRID SYSTEM
WITH GROUND MOUNT PV

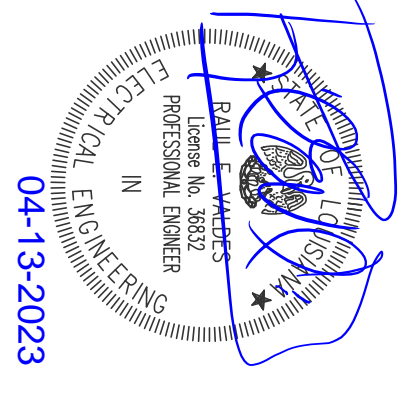
Revisions		
No.	Issue	Date

Project Name and Address

UNIVERSITY OF LOUISIANA
AT LAFAYETTE-CLECO
POWER 2008 HUTCHINSON
AVE CROWLEY, LA 70526

Drawn By	DAE	Sheet
Date	04/13/2023	E002
Scale	N/A	





General Notes
MICROGRID SYSTEM
WITH GROUND MOUNT PV

Revisions		
No.	Issue	Date

Project Name and Address

UNIVERSITY OF LOUISIANA
AT LAFAYETTE-CLECO
POWER 2008 HUTCHINSON
AVE CROWLEY, LA 70526

Drawn By	DAE	Sheet
Date	04/13/2023	E300
Scale	N/A	

SPECIFIC NOTES:

- ① EXISTING CONDUCTORS, EXTEND FEEDERS TO RELOCATE BREAKERS TO NEW PANEL, MATCH NEW CONDUCTORS & CONDUIT TO EXISTING.

String Max Voltage Calculation:
 V_{oc} temperature adjustment at $-4^{\circ}C = 1 - [\Delta T] / 100$
 $1 - [-0.35 \%/^{\circ}C * (25^{\circ}C - (-4^{\circ}C))] / 100 = 1.0928$
 $V_{oc} @ -4^{\circ}C = V_{oc} @ 25^{\circ}C * \text{temp adjustment factor}$
 $213.8 \text{ V} * 1.0928 = 233.6406 \text{ V}$
 Max String Length =
 $\text{Max Voltage} / \text{Temp adjusted } V_{oc}$
 $1500 \text{ V} / 233.64 \text{ V} = 6.4$ Modules = 6 Modules

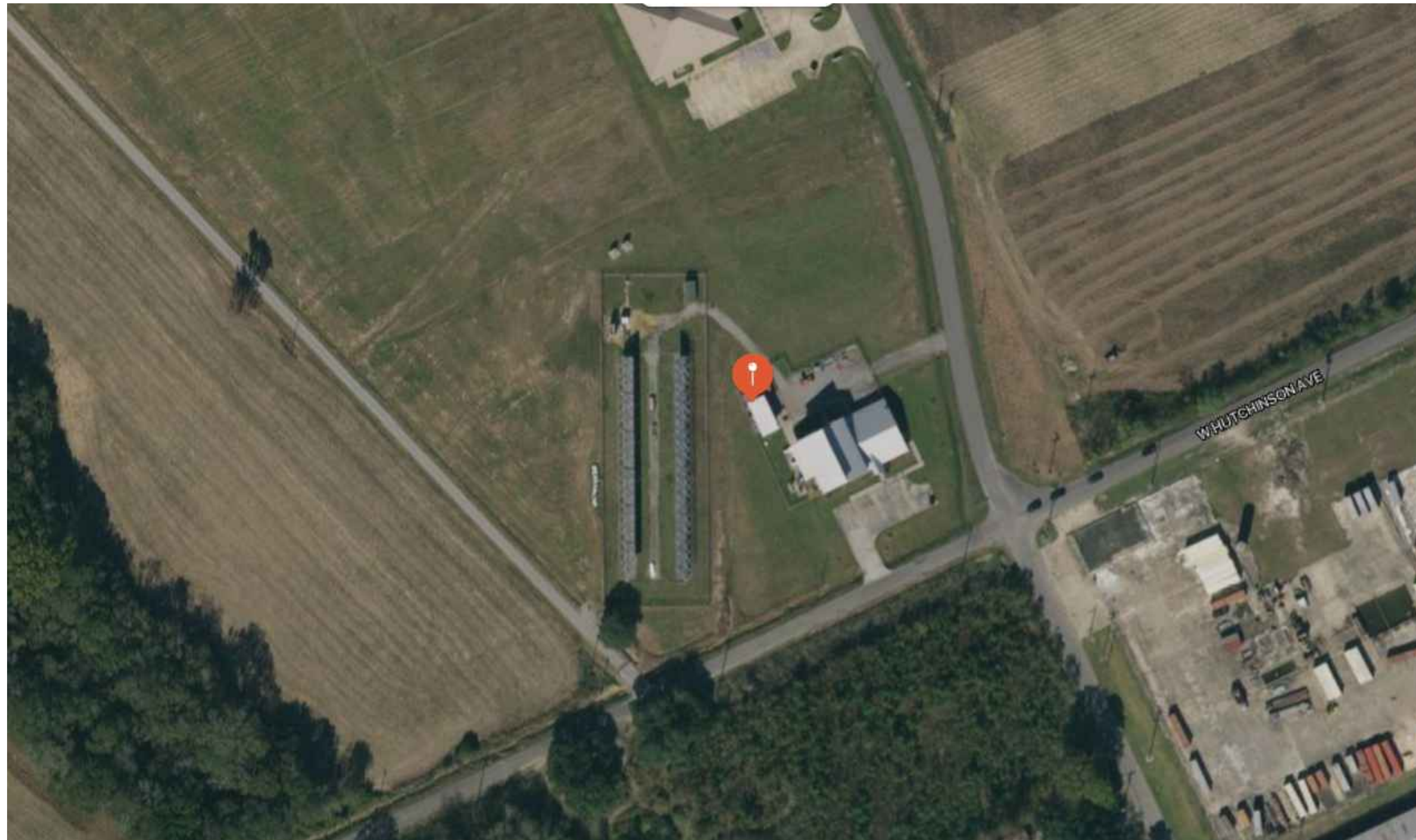
Inverter Specifications:	
Dynapower MP5-125	
Max DC Input Power	125 kW
Max DC Input Current	171 A
Max AC Output Power	125 kW
AC Output Current	80 A
Max DC Voltage	1500 V
DC Operating Voltage	740-1500 V
AC Nominal Voltage	480 VAC 3-Ph

Module Specifications: First Solar FS-6380A	
Nominal Power	380 W
TEMP CoEFF (VOC)	-0.35 %/°C
VMP	171.6 V
IMP	2.21 A
VOC	213.8 V
ISC	2.48 A
Height	79"
Width	49"
Depth	2"
Max Series Fuse	6 A
Max System Volt	1500 V

Wire Schedule												
Tog	Set	# Per Set	FLA	OCPD (A)	Size	Type	Ground	V	Length (ft)	Voltage Drop (%)	Conduit	Notes
A	2	11	7	10	CU #12	PV Wire	CU #12	1500	25-300	0.55	Free air	
B	1	2	93		CU 2/0	XHHW-2	CU #8	1500	550	0.63	1-1/2" PVC	
C	1	2	85	90	CU #2	XHHW-2	CU #8	1000	15		1" EMT	
D	1	2	85	90	CU #2	XHHW-2	CU #8	1000	15		1" EMT	
E	1	2	125	125	CU #1	XHHW-2	CU #6	1000	30		1-1/4" EMT	
F	1	2	125	125	CU #1	XHHW-2	CU #6	1000	30		1-1/4" EMT	
G	1	2	215	225	CU 4/0	XHHW-2	CU #4	1000	10		1-1/2" EMT	
H	1	3	200	200	CU 3/0	THHN	CU #6	480	30		2" EMT	
I	1	4	200	200	CU 3/0	THHN	CU #6	480	100		2" EMT	
J	1	4	50	50	CU #6	THHN	CU #10	480	50		2" EMT	
K	1	4	100	100	CU #1	THHN	CU #8	480	300	2.18	1-1/2" EMT	①
KK	1	4	100	100	CU #1	THHN	CU #8	480	5		1-1/2" EMT	
L	1	4	60	60	CU #4	THHN	CU #10	480	200	1.64	1-1/4" EMT	①
LL	1	4	60	60	CU #4	THHN	CU #10	480	5		1-1/4" EMT	
M	1	4	150	150	CU 1/0	THHN	CU #6	480	100		2" EMT	
N	3	4	600	600	CU 3/0	THHN	CU #1	480	10		2" EMT	
O	3	4	600	600	CU 3/0	THHN	CU #1	480	40		2" EMT	
P	3	4	600	600	CU 3/0	THHN	CU #1	480	15		2" EMT	
Q	2	4	400	400	CU 3/0	THHN	CU #3	480	40		2" EMT	
R	3	4	600	600	CU 3/0	THHN	CU #1	480	20		2" EMT	
S	1	4	40	40	CU #8	THHN	CU #10	480	125	1.38	1" EMT	
T	1	3	7	15	CU #8	THHN	CU #10	240	550	2.45	1" PVC	



Overhead View



UNIVERSITY OF LOUISIANA AT LAFAYETTE—CLECO ALTERNATIVE ENERGY CENTER

ISLANDING MICROGRID SYSTEM

2008 HUTCHINSON AVE.
CROWLEY, LA 70526



5804 River Oaks Rd S
Elmwood, LA 70123
1-504-267-1660

General Notes

MICROGRID SYSTEM
WITH GROUND MOUNT PV

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PV System Size: 50 kWDC
 Module Manufacturer: First Solar
 Module Model: FS-6380A
 Module Quantity: 132
 String Quantity: 22

Inverter Manufacturer: DynaPower
 Inverter (Qty) Model: (1) MPS-125 EHV
 480V 3P

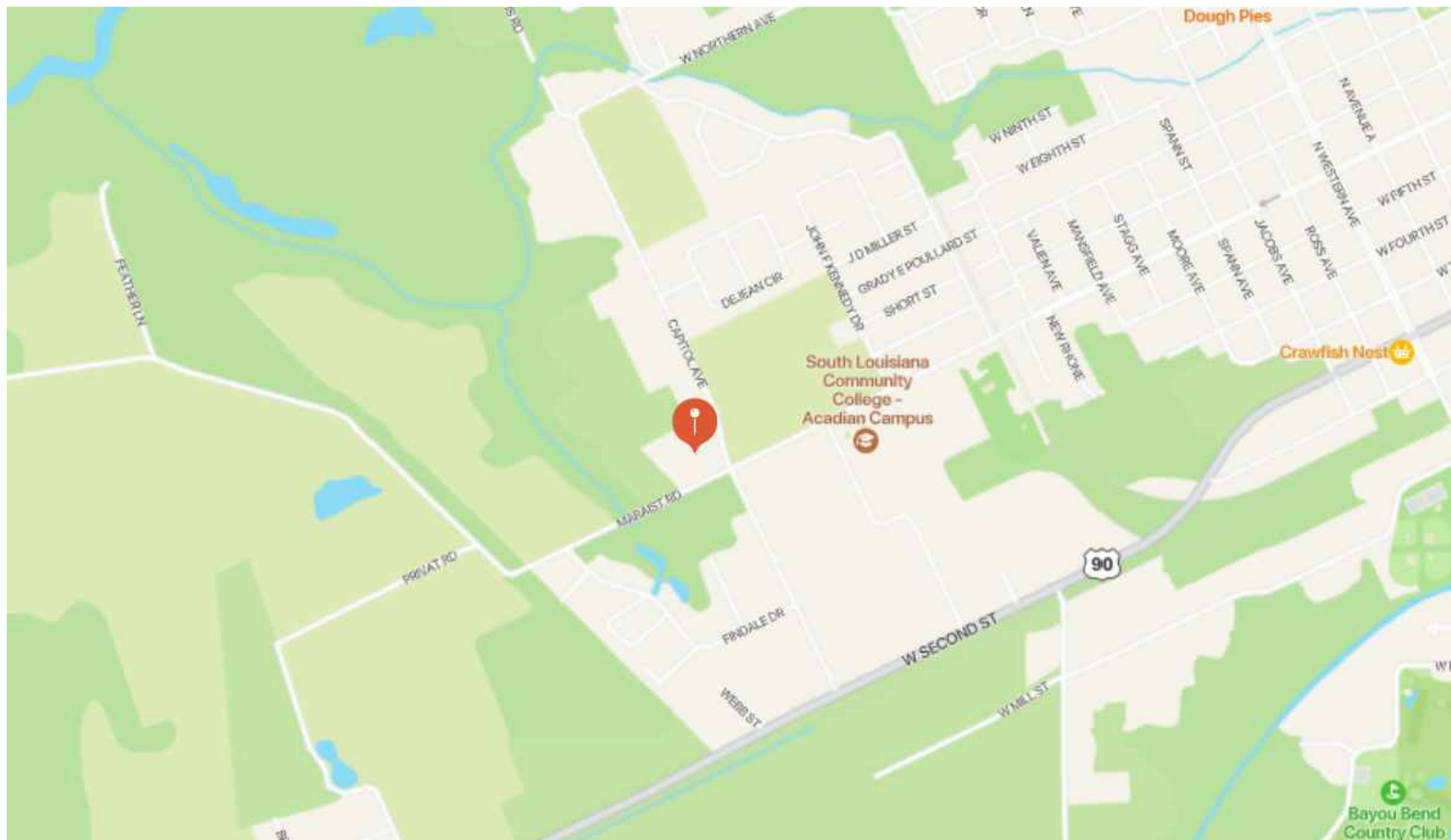
Battery Manufacturer: Blue Planet Energy
 Battery System: 128 kWh Battery

Electric Vehicle
 Service Equipment [EVSE] ChargePoint CPE100 Series
 24kW

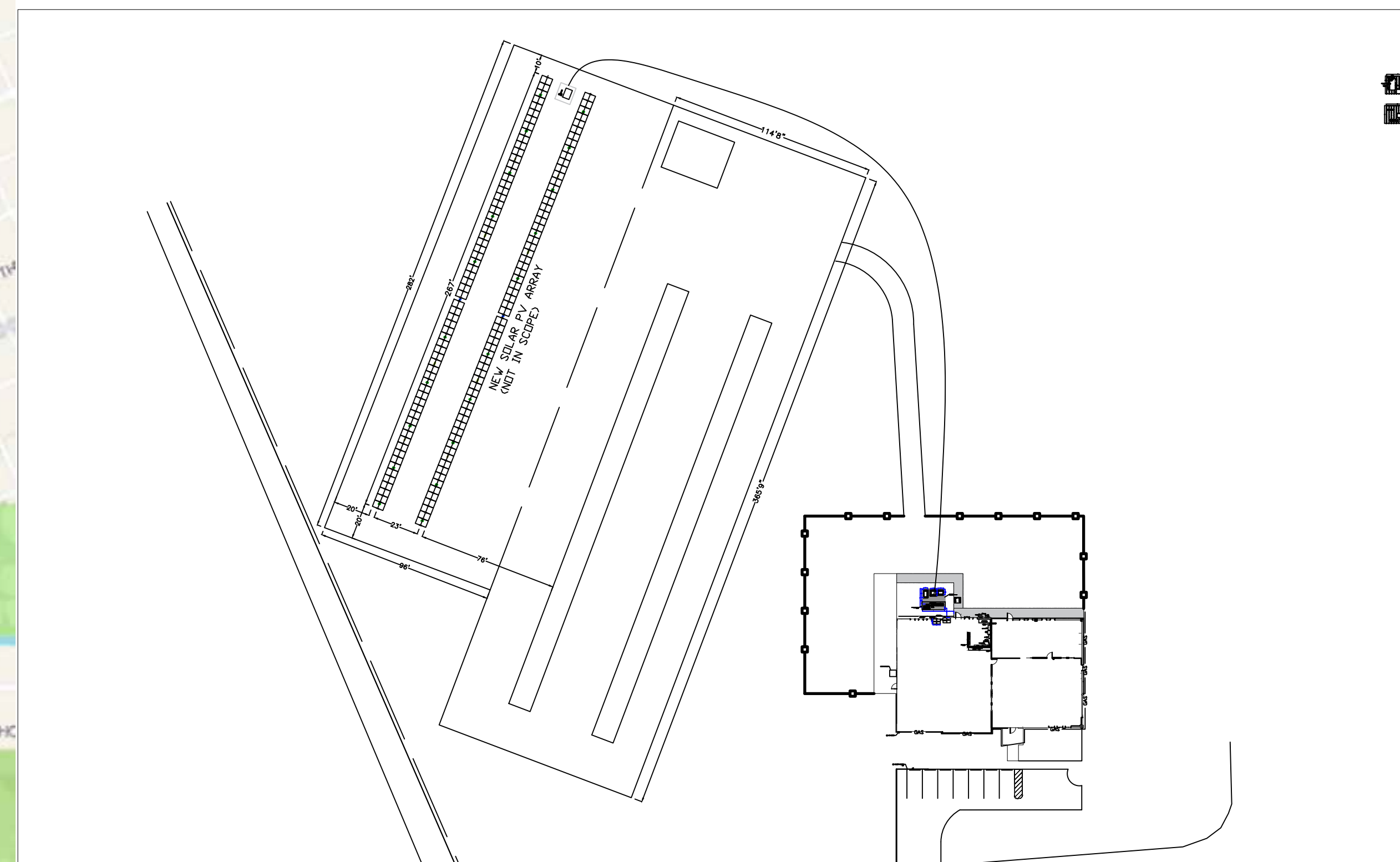
Scope of Work Summary

- Partial demolition of existing equipment and installation of new equipment
 Integration of existing generation sources and loads into AC bus
 Microgrid upgrade including:
- 50kW Ground-Mounted PV Array Installation
 - Energy Storage System – Battery and DC/AC Inverter
 - AC Source Bus
 - AC Test Load
 - Facility Grid Contactor
 - Microgrid Controller

Location Map



System Plan



Revisions		
No.	Issue	Date
110822	REVIEW	
120222	REVIEW	
121222	REVIEW	
122022	REVIEW	
090823	BID SET	
092023	PAD UPDATE	

Project Name and Address

UNIVERSITY OF LOUISIANA AT LAFAYETTE—CLECO POWER
2008 HUTCHINSON AVE
CROWLEY, LA 70526

Drawn By
Andrea Lee, Nick Boyd

Date
09/15/2022

Scale
N/A

Sheet
PV-1.0

Electrical Notes

The contractor shall obtain all necessary certifications for work installed, pay all related fees and charges, and deliver all certificates and inspection approvals to the owner before his work will be considered complete.

All work shall be in accordance with the National Electrical Code (NEC) and all materials shall be OSHA Nationally Recognized Testing Laboratory (NRTL) or Underwriters Laboratories (UL) labeled.

All new equipment shall have an interrupt rating (kAIC) greater than or equal to the existing equipment.

All inverters shall be IEEE 929 compliant and be inspected by the local utility before commissioning, testing, and operation.

Installation

Installer/subcontractor shall have a NABCEP PV Technician certification or equivalent, and should have successfully completed at least two other nonresidential solar PV projects of equal or greater size and complexity.

All work shall be installed in a first class and neat manner by those skilled in the trade involved. All details of the installation shall be electrically and mechanically correct.

Torque and mark all racking and mechanical lugs.

Conductor Installation

PV system conductors shall be identified per NEC 690.31(B).

THHN/THWN-2 insulation is acceptable for aluminum MC Cable. For aluminum conductors XHHW-2 shall be used.

Compression lugs shall be used on all aluminum cable terminations. Mechanical lugs may only be used for copper cable terminations.

Noalox to be used with all aluminum lugs.

Install wire and cable in accordance with the NEC, the National Electrical Contractors Association's (NECA) "Standard of Installation", and the Manufacturer's installation instructions. The installation shall be in accordance with recognized industry practices and the local authority having jurisdiction.

String wiring and homeruns shall be secured to the underside of the modules and racking using Sunbundler-type PVC coated stainless ties outdoor rated for UV. Outside of array, transition to EMT conduit.

The use of wire splices is prohibited (except in order to relocate LP-1).

Wire lube is required for 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.

Raceways and Conduit

Raceway sizes shall be no less than 3/4" in diameter.

PVC conduits shall be schedule 80.

Conduit shall be EMT where not subject to physical damage. Conduits shall be IMC or RMC where subject to physical damage. PVC conduits are only permitted in below grade duct banks. Rooftop locations are considered subject to physical damage.

All rooftop conduit shall be marked per local fire codes.

All penetrations shall be sealed to maintain the existing fire rating.

EMT conduit shall use properly installed, factory-stamped raintight compression connectors.

Drawings show raceway locations, but contractor may adjust to suit field locations.

Conduit elbows shall be of the same make, quality, and finish as the conduit used.

Apply two protective coats of asphaltum compound for any galvanized steel conduits directly buried in earth.

Provide expansion fittings with bonding jumpers for every 100' of straight conduit run. Conduit expansion and deflection fittings with bonding jumpers shall be used whenever crossing building expansions.

Leave wire sufficiently long to permit making final connections.

Conduit over 10' in length shall be provided with synthetic pulling rope.

A bucket 15" wide or less shall be used for trenching.

All conduit trenches must be minimum of 18" or as required by code, and use detectable underground warning tape.

Repair surfaces damaged by trenching to match previously existing conditions.

Phase Relationship

Connect feeders to preserve phase relationship throughout the system. Phase legs of feeders shall match bus or cable arrangements for all connected equipment. Color coding shall be as follows:

-600 VAC, 1000 VDC, 1500 VDC
 -Ungrounded Positive Conductor: Red
 -Ungrounded Negative Conductor: Black
 -AC and DC Systems:
 -Grounded Conductor: White
 -Ground: Green

-208/120 VAC
 -A Phase: Black, B Phase: Red, C Phase: Blue

-277/480 VAC
 -A Phase: Brown, B Phase: Orange, C Phase: Yellow

Color coding must be used consistently for the entire project. Where color coded cable is not used, tape conductor with overlapping colored tape.

Enclosures

Outdoor electrical enclosures shall be rated NEMA 3R, 4, Or 4X. Indoor enclosures shall be rated NEMA 1. All electrical equipment shall be listed or labeled by a recognized testing agency.

Panelboard doors shall be quarter turn latches or external handle with internal latches only.

Penetrations or cable entries in the top of outdoor enclosures are not permitted. Enter outdoor enclosures from the bottom or side.

Conduit terminating in outdoor enclosures shall use Myers-type hubs including a ground screw. Use raintight fittings for all cable entries.

Arc flash hazard warning labels shall be mounted on every combiner box, terminal box, inverter, AC and DC switch, transformer, and switchgear.

Handholes, pull boxes, or conduit bodies shall be installed 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 in accordance with the National Electrical Code.

Tests

Final tests 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 to ensure quality installation and submit results to owner for review.

General Notes

The general notes apply to all solar-related "PV" numbered drawings under the contract. Refer to individual drawings for any additional notes.

The drawings indicate general arrangement of systems and work. Follow drawings in laying out work and verify space conditions. Maintain headroom, working conditions, and required clearances.

The PV system contractor shall coordinate all work with the engineer, the construction manager, and any other contractors to ensure that the PV system is installed as specified in these drawings.

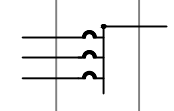
Personal Protective Equipment (PPE) shall be used in accordance with NFPA 70E and OSHA requirements.

Unforeseen obstructions may require a change to the array layout. Changes to the array layout should be made as to not change the number of modules on a inverter.

Legend - Symbols

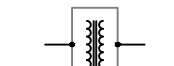
 Solar Module

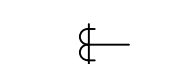
 Junction Box

 Panel Board

 Circuit Breaker

 DC/AC Inverter

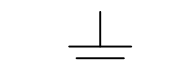
 Transformer

 Current Transducer

 Disconnect Switch

 Fused Disconnect Switch

 Fuse

 Earth Ground

Adopted Codes

Adopted National Electrical Code Version:	2020
Adopted International Building Code Version:	2021
Adopted International Fire Code Version:	2015
Adopted International Mechanical Code Version:	2021
Adopted International Residential Code Version:	2021

ASCE/ANSI 7-10 Minimum Design Loads for Buildings and Other Structures

Authority Having Jurisdiction: City of Crowley

Utility: Cleco Power

Have a single labeled manual disconnect for the entire renewable facility at a service, approved by the utility on the outside (available to Cleco 24 hours a day with no notice).

Be able to synchronize with the utility and stay synchronized

Have safety measures that prevent the generator from feeding electricity to the utility when the line is non-energized, or in an abnormal voltage or frequency situation or cause a degradation of the safety or quality of power on the electrical grid (i.e. UL1741 listed inverter).

Obtain all permits required by local authorities.

Abbreviations

Diameter or Phase	Ø
Amperes	A
Arc Fault Circuit Interrupter	AFCI
Amps Interrupting Capacity	AIC
Automatic Transfer Switch	ATS
American Wire Gauge	AWG
Circuit Breaker	BKR
Conduit	C
Combiner Box	CB
Current Transducer	CT
Circuit Breaker	CKT
Control Panel	CP
Copper	CU
Disconnect	DISCO

Equipment Grounding Conductor	EGC
Electric, Electrical	ELEC
Emergency	EMERG
Electrical Metallic Tubing	EMT
Equipment	EQUIP
Existing	EXIST
Ground	G, GND
Grounding Electrode Conductor	GEC
Ground-Fault Circuit Interrupter	GFCI
Ground-Fault Protection of Equipment	GFPE
High-Intensity Discharge (Lightning)	HID
Hertz	Hz
Intermediate Metallic Conduit	IMC
1000 Amps Interrupt Capacity	kAIC
1000 Circular Mills	kCMIL
Kilo-Volt Ampere	kVA
Kilowatt	kW
Lightning and Surge Arrestor	LA
Lightning	LTG
Long, Short, Instantaneous, and Ground Fault	LSIG
Maximum	MAX
Main Control Panel	MCP
Manufacturer	MFG
Main Lugs Only	MLO
Minimum	MIN
National Electrical Manufacturers Association	NEMA
Not To Scale	NTS
Pole	P
Power Factor	pf
Programmable Logic Controller	PLC
Primary	PRI
Polyvinyl Chloride	PVC
Power	PWR
Receptacle	RCPT
Rigid Galvanized Steel Conduit	RGS
Rigid Metal Conduit	RMC
Secondary	SEC
Short-Circuit Current Rating	SCCR
Surge Protection Device	SPD
Supply Side Bonding Jumper	SSBG
Switch	SW
To Be Determined	TBD
Typical	TYP
Volt	V
Volt-Ampere	VA
Watt	W
Weatherproof	WP
Transformer	XFMR

SOLAR ALTERNATIVES

5804 River Oaks Rd S
 Elmwood, LA 70123
 1-504-267-1660

General Notes

MICROGRID SYSTEM
WITH GROUND MOUNT PV

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PV-5.5 EQUIPMENT ROOM ELEVATION

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PV-5.7 OUTDOOR WALL ELEVATION

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Project Name and Address

UNIVERSITY OF LOUISIANA AT
 LAFAYETTE-CLECO POWER
 2008 HUTCHINSON AVE
 CROWLEY, LA 70526

Drawn By
 Andrea Lee, Nick Boyd

Sheet

Date 09/15/2022




Scale

PV-1.1

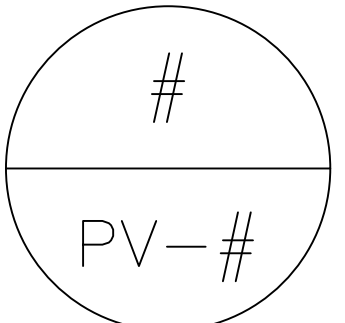
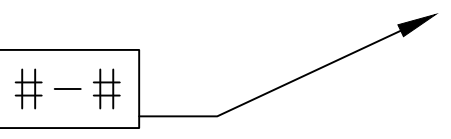

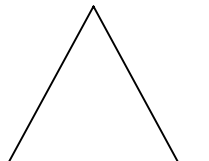
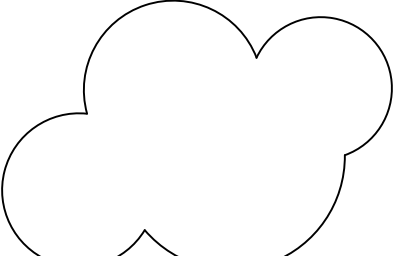
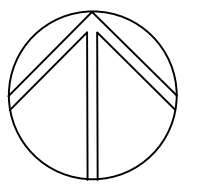
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General Notes

LEGEND - GENERAL

-  LIGHT LINES INDICATE EXISTING OR BEYOND THE PROJECT SCOPE
-  DARK LINES INDICATE NEW OR WITHIN THE PROJECT SCOPE
-  DASHED LINES INDICATE EQUIPMENT INSTALLED AT A LATER DATE
- TEXT LIGHT TEXT INDICATES EXISTING OR BEYOND THE PROJECT SCOPE
- TEXT DARK TEXT INDICATES NEW OR WITHIN THE PROJECT SCOPE

LEGEND - SYMBOLS/ANNOTATIONS

	REFERENCE NUMBER OR COUNT REFERENCE DRAWING OR PAGE
	ARRAY SECTION - STRING NUMBER
	STRING
	REFERENCED DRAWING OR SECTION
	REVISION CLOUD OR PENDING MORE INFORMATION
	NORTH INDICATOR

General Notes
MICROGRID SYSTEM
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Project Name and Address
UNIVERSITY OF LOUISIANA AT
LAFAYETTE-CLECO POWER
2008 HUTCHINSON AVE
CROWLEY, LA 70526

Drawn By
Andrea Lee, Nick Boyd

Date 09/15/2022

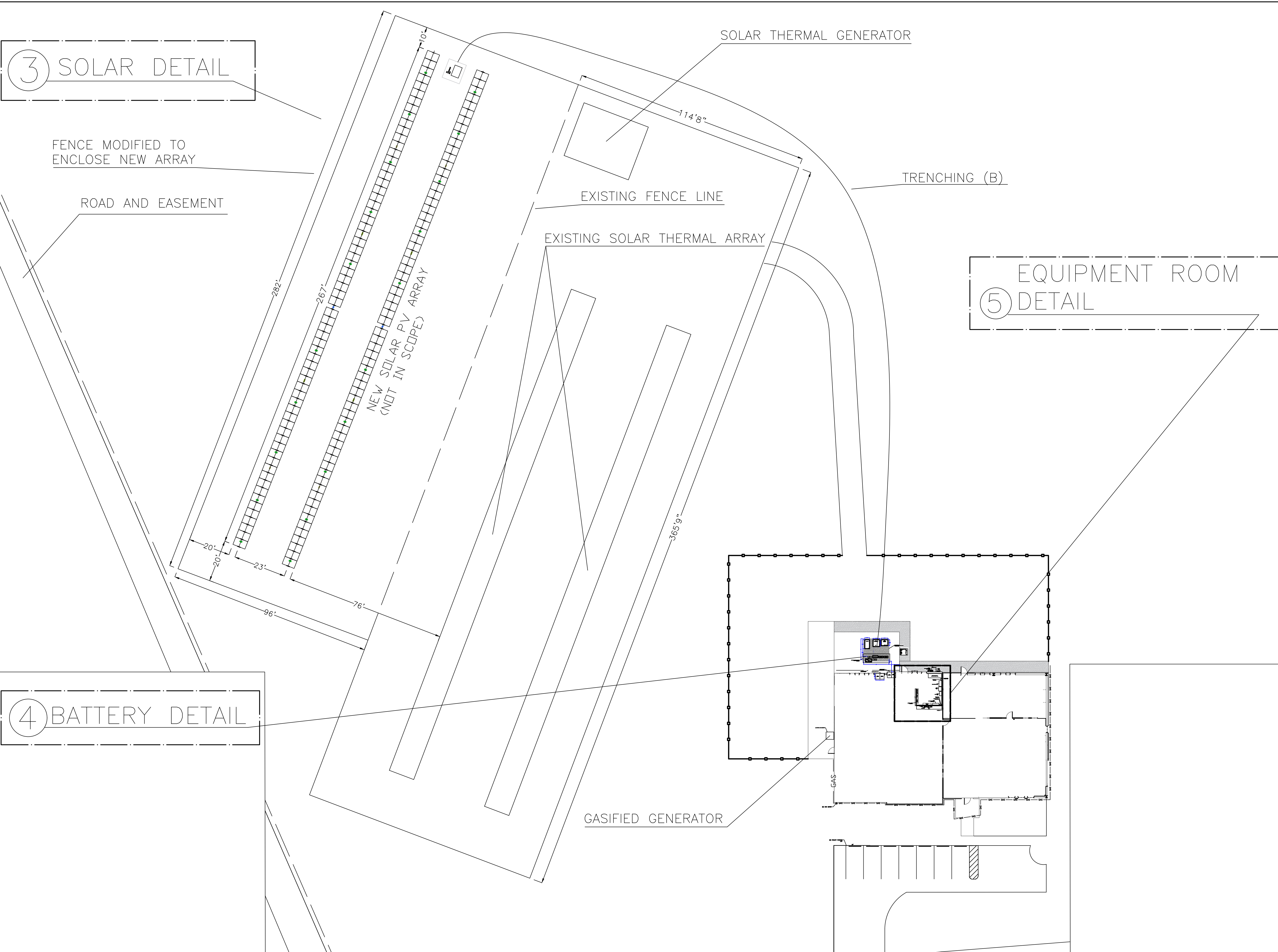
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PV-1.2

3 SOLAR DETAIL

EQUIPMENT ROOM
5 DETAIL



4 BATTERY DETAIL

General Notes

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PV-2.0

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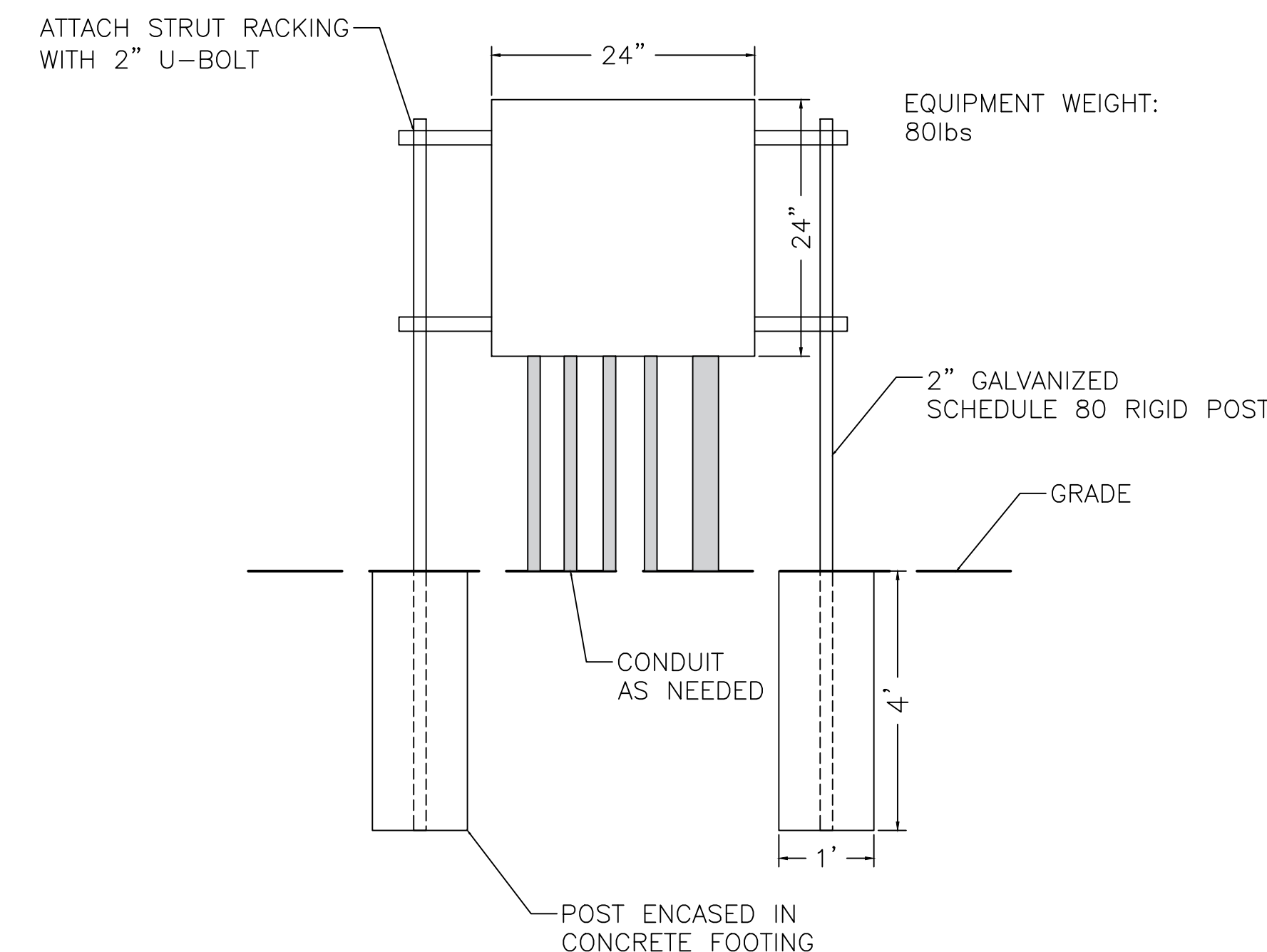
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PV-3.0

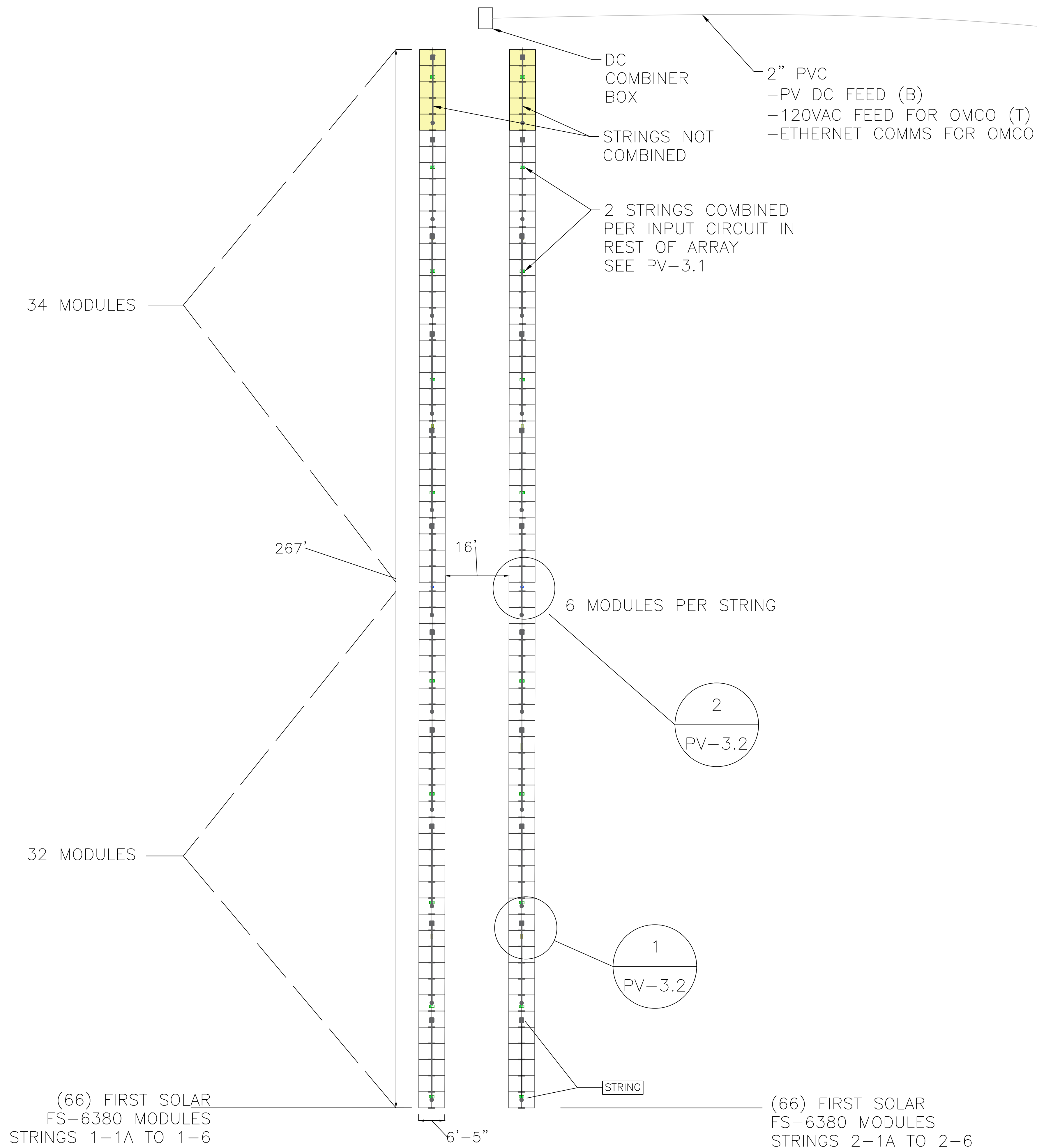
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① DC COMBINER BOX
RACK DETAIL



NOTE:

1. INSTALLATION OF RACKING AND MODULES BY OTHER CONTRACTOR (NOT IN SCOPE)
2. DRIVE AND PILE LOCATIONS ARE PER MANUFACTURERS INSTRUCTION
3. TWO HORIZONTAL SINGLE-AXIS TRACKERS
4. 66 PV MODULES AND 11 POSTS PER TRACKER
5. RANGE OF MOTION - 120°
6. ONE BRUSHED 24VDC MOTOR PER TRACKER



(66) FIRST SOLAR
FS-6380 MODULES
STRINGS 1-1A TO 1-6

(66) FIRST SOLAR
FS-6380 MODULES
STRINGS 2-1A TO 2-6

General Notes

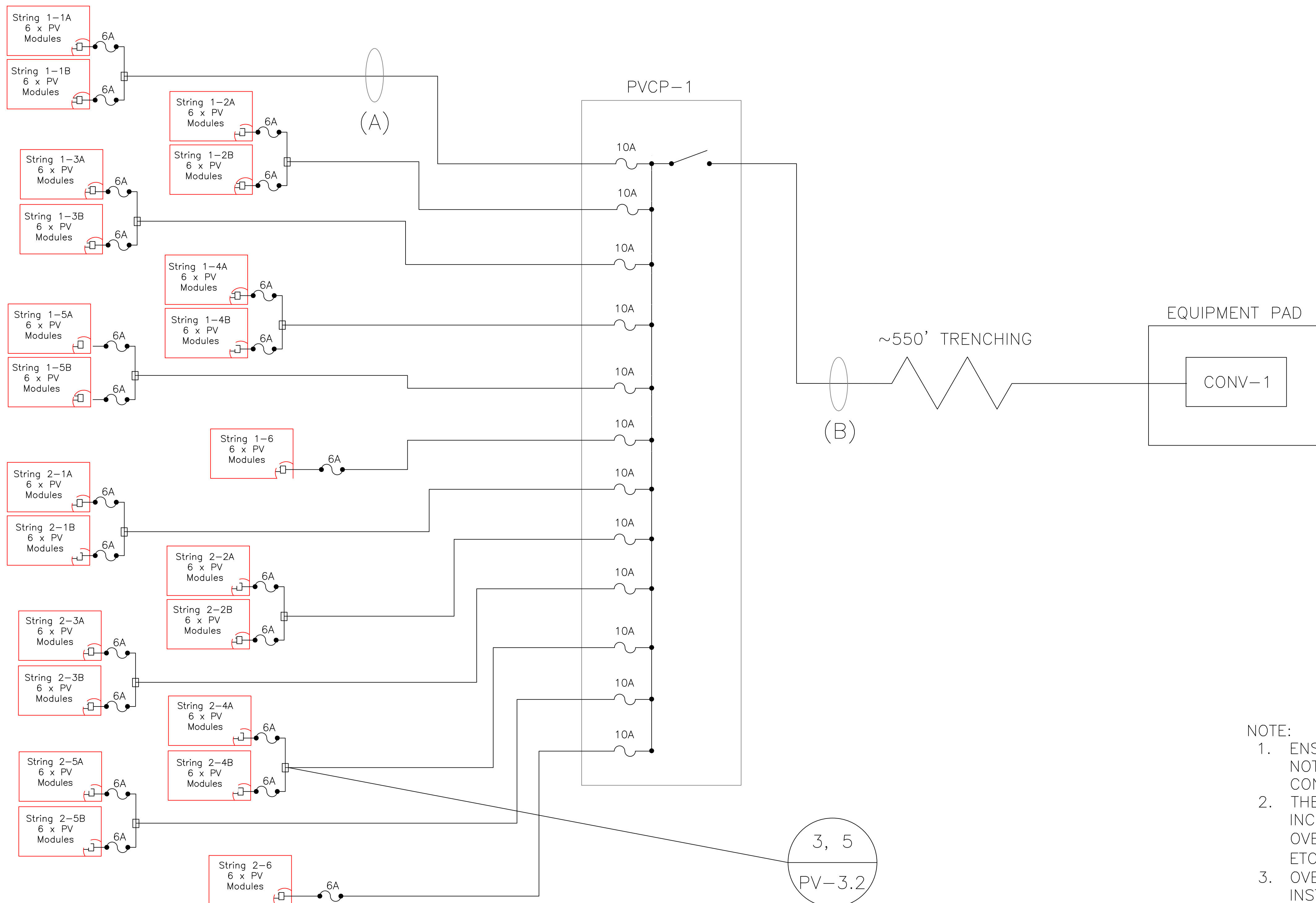
MICROGRID SYSTEM
WITH GROUND MOUNT PV

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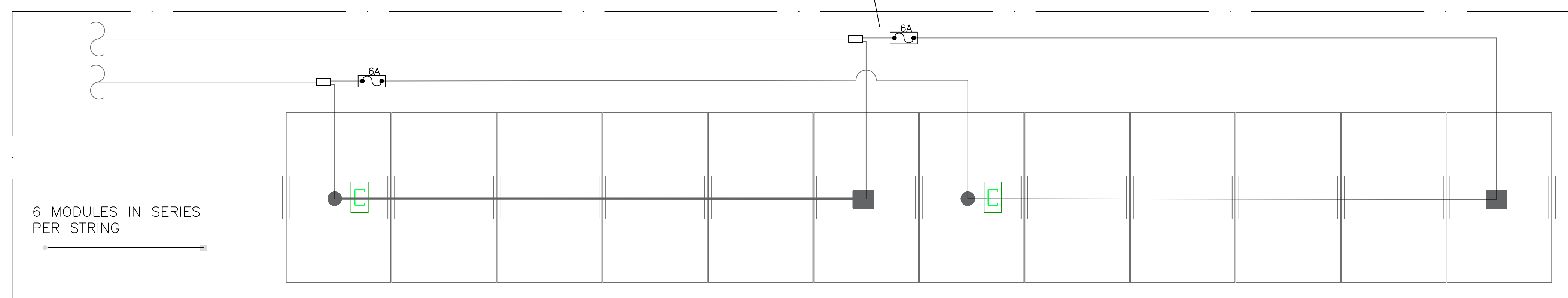
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- NOTE:
1. ENSURE LARGE INRUSH CURRENTS ARE NOT DRAWN FROM THE DC-DC CONVERTER.
 2. THE DC-DC CONVERTER DOES NOT INCLUDE ANY FUSING OR OTHER FORM OF OVERCURRENT PROTECTION [DISCONNECTS, ETC.]
 3. OVERCURRENT PROTECTION MUST BE INSTALLED IN ACCORDANCE TO LOCAL CODES



TYPICAL STRING WIRING

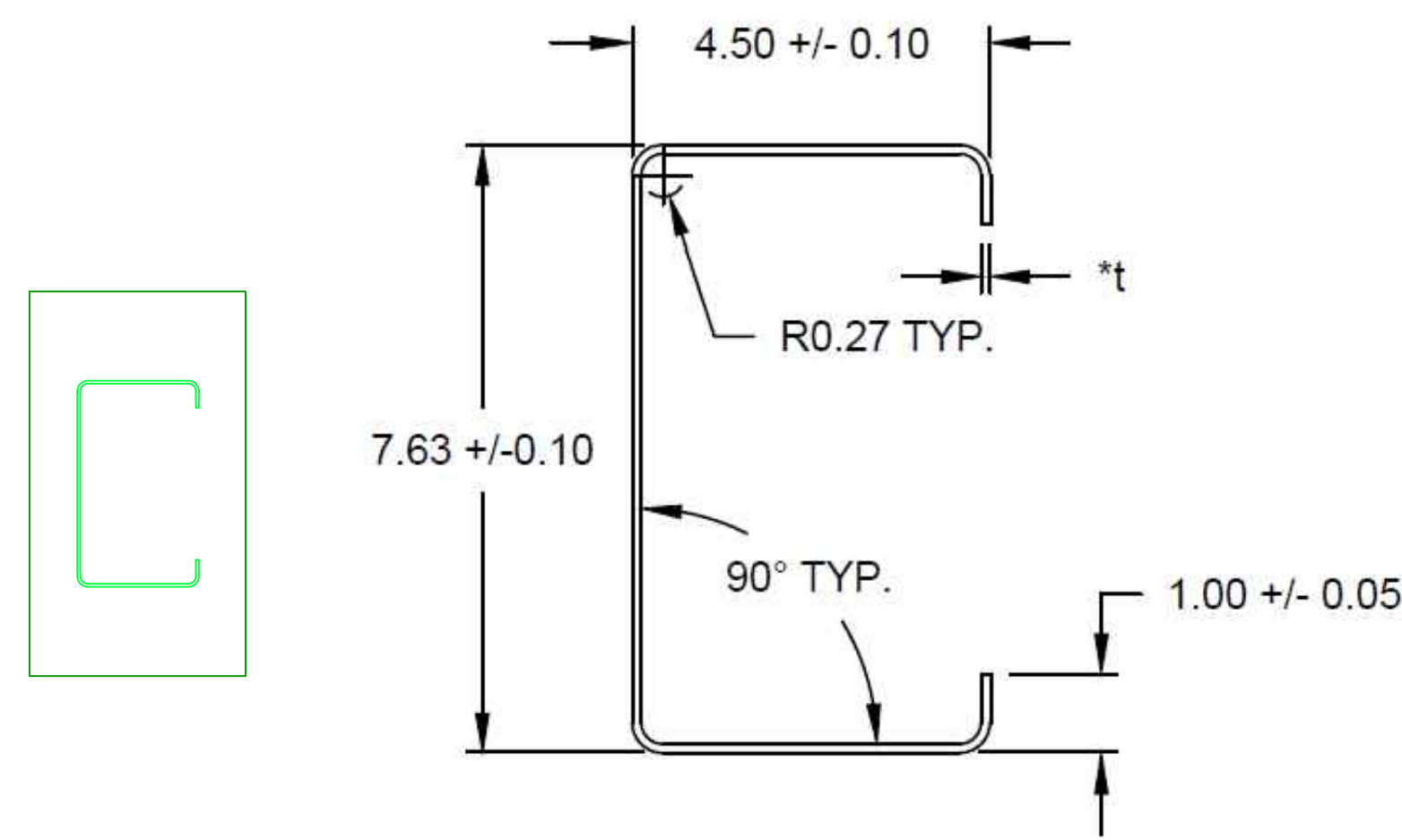


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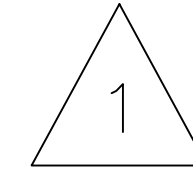
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PV-3.1

DRIVE POST

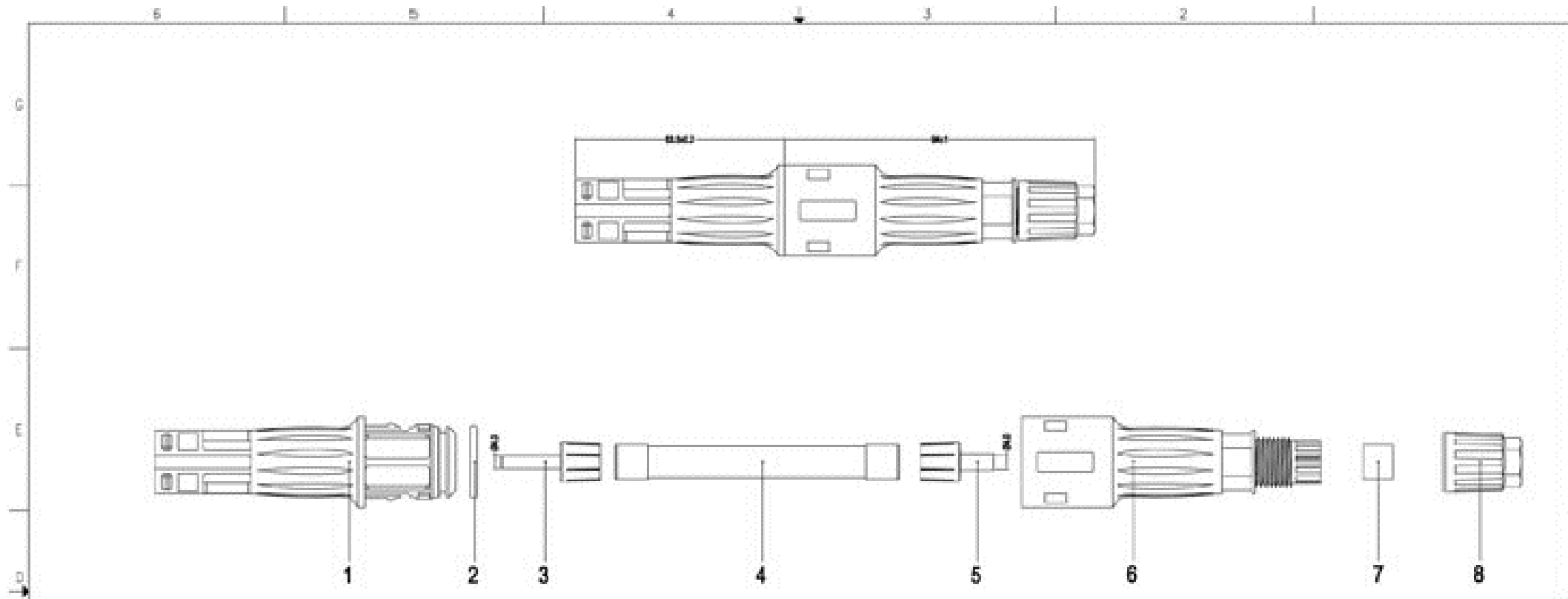
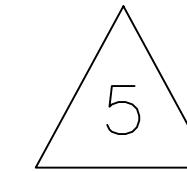


SECTION A

NOTES. GR50-MIN
GR235 GALVANIZED
DEPTH PER MANUFACTURER



IN-LINE PV FUSE

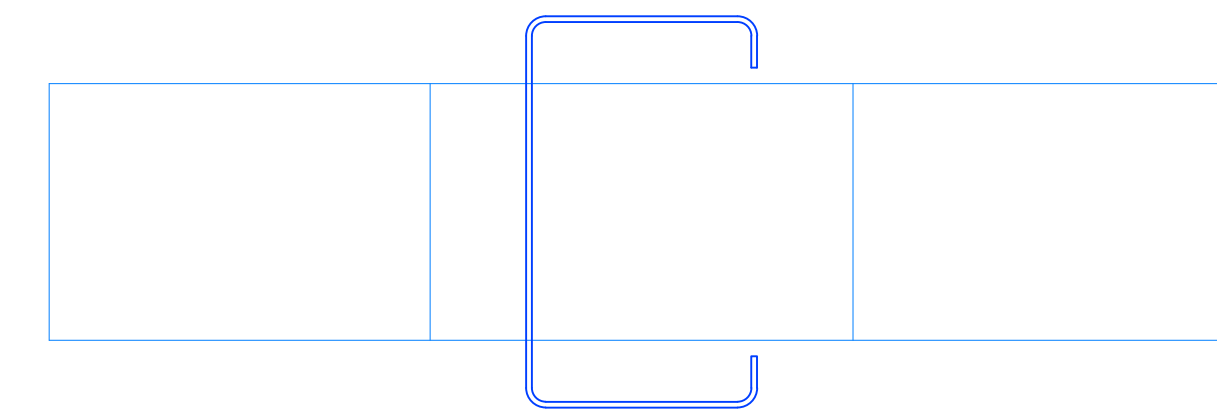


8	SY-TC4A-P01-00	Ø15 Tumcap	1	Black	PPO
7	SY-TC4B-S01-00	Ø10.5*7.0 Waterproof Ring (For 4-6MM ² Cable)	1	Black	Silicone
6	SY-CF0-15-P03	Ø4.0 Cable Male Connector Housing	1	Black	PPO
5	SY-CF3-15-M01	Ø4 Cable Terminal	1	White	Copper
4	SY-CF0-15-M01	FUSE 15A(Ø10x85mm)	1	White	Ceramic
3	SY-CF0-15-M01	Ø4 Male Terminal	1	White	Copper
2	SY-CF0-15-S01	Ø22*2*0" Ring	1	Red	Silicone
1	SY-CF0-15-P01	Ø4.0 Male Connector Housing	1	Black	PPO

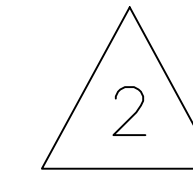
No.	Product No.	Product Name	QTY	Colour	Material
-----	-------------	--------------	-----	--------	----------

Dimension	Tolerance	LEADER TECHNOLOGY (SHENZHEN) CO., LIMITED
30.00-60.00	±0.05	
60.00-90.00	±0.05	
90.00-120.00	±0.05	
120.00-	±0.05	
Angle		
D-Ø1"	±0.05	
Ø2"	±0.05	

BEARING AND POST



NOTES. GR50-MIN
GR235 GALVANIZED
UL 3703



General Notes

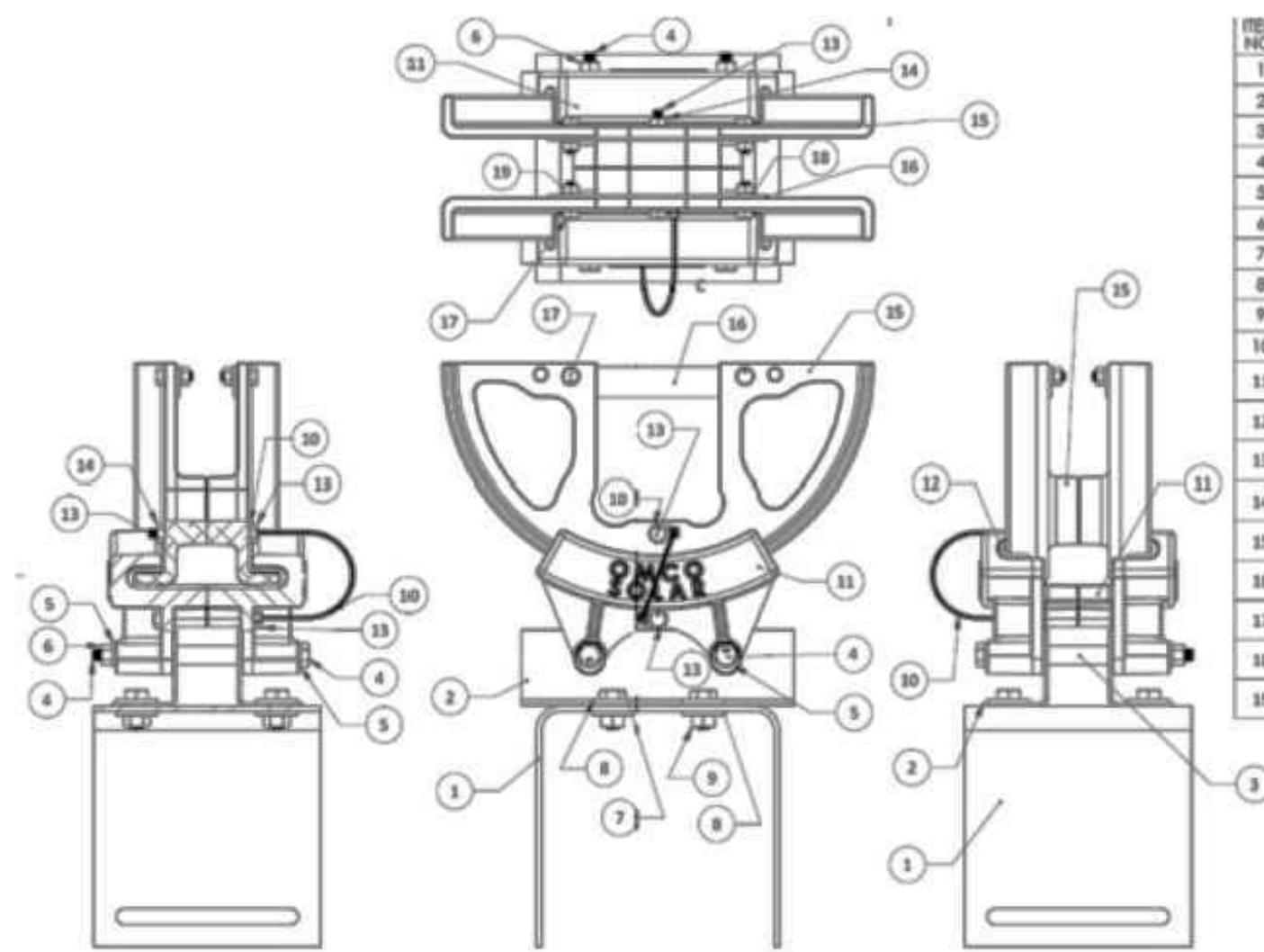
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BEARING ASSEMBLY

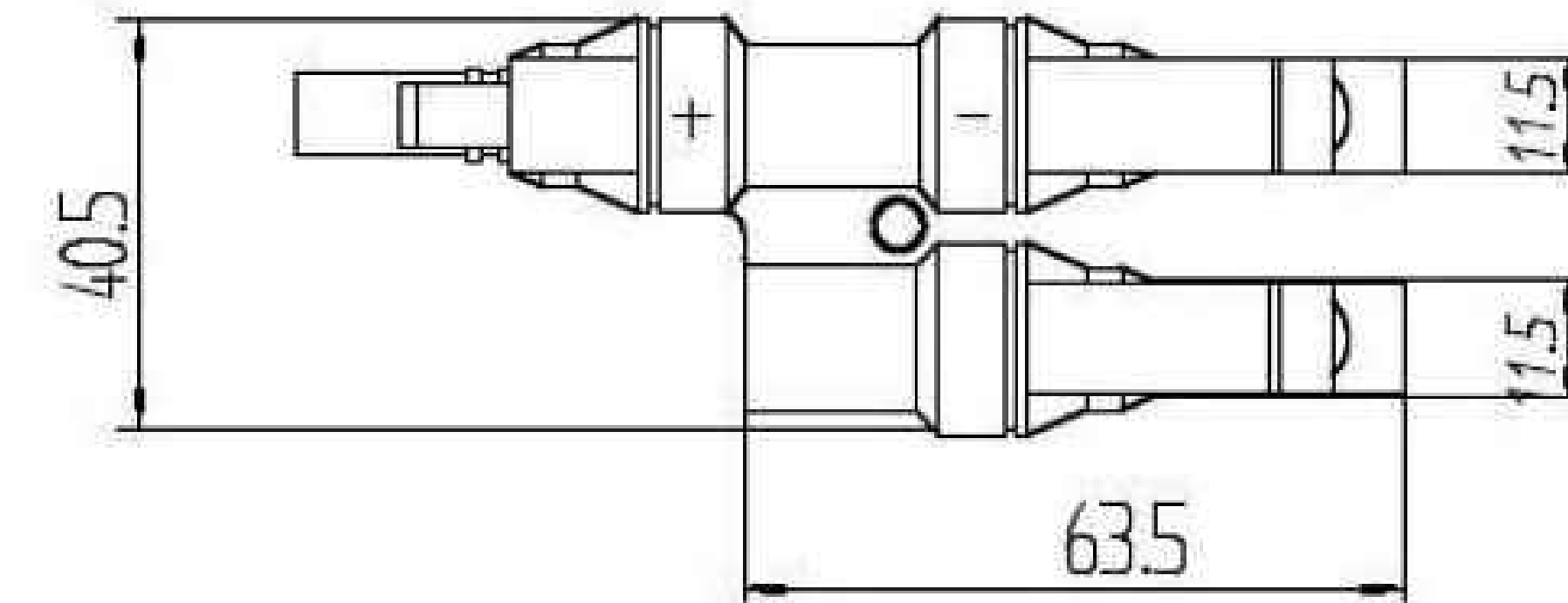
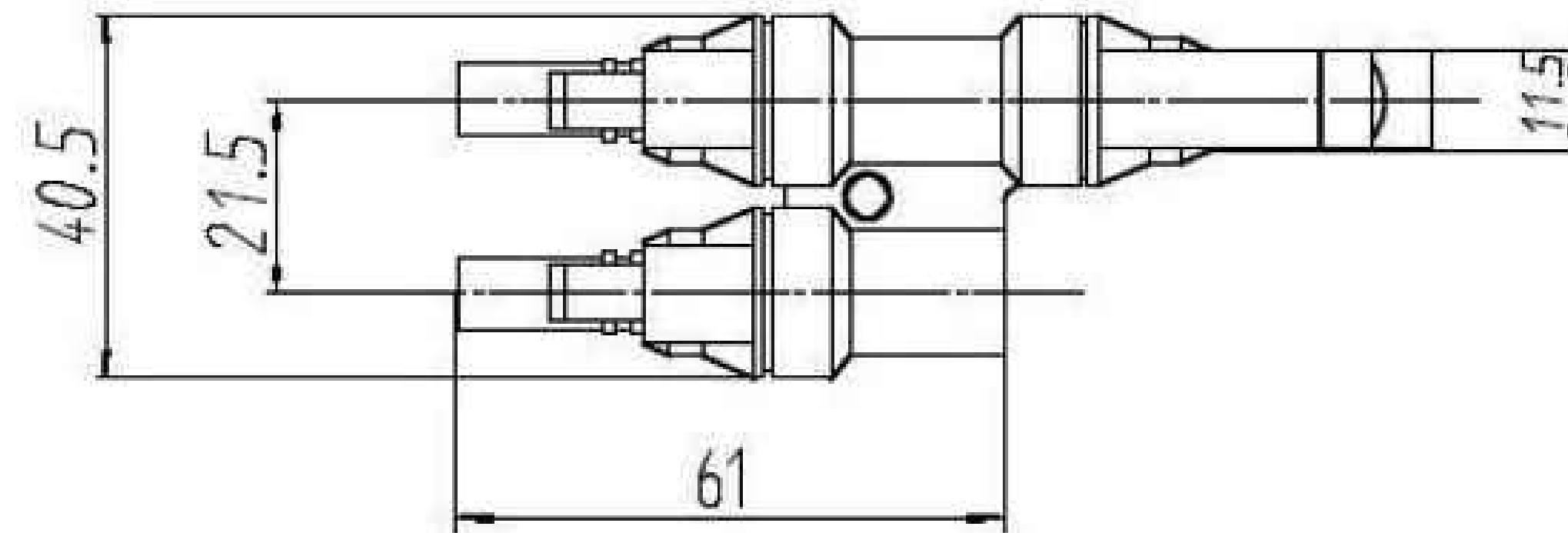


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	PCD-1000	POST CAP OPTIMIZED	1
2	LB-1000	L-BRACKET	2
3	S-1000	SLEEVE, MASTER	2
4	SN/181230	M10 X 180 HEX HEAD BOLT	2
5	SN/182726	M10 WASHER	4
6	SN/131952	M10 HEX NUT	2
7	SN/162806	M12 X 25 HEX HEAD BOLT	4
8	SN/132809	1/2" USS WASHER	8
9	SN/131959	M12 HEX NUT	4
10	IS-146-00	GROUNDING JUMPER	1
11	BS-1000	BEARING SADDLE	2
12	BI-1000	BEARING INSERT	2
13	SN/182705	M8 X 90 HEX HEAD BOLT	2
14	SN/153963	M8 HEX NUT	2
15	BR-1000	BEARING RING	2
16	HDS-1000	HOLD DOWN STRAP	2
17	SN/181234	M8 X 30 HEX HEAD BOLT	4
18	SN/182731	M8 WASHER	8
19	SN/153963	M8 HEX NUT	4

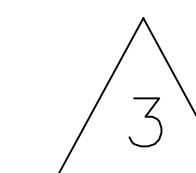


SEE "PV-10 EQUIPMENT SPECIFICATION"
FOR ADDITIONAL DETAILS

SOLAR BRANCH CONNECTORS



NOTES. PPO INSULATED
COPPER PLATED
20-50A, 1500VDC



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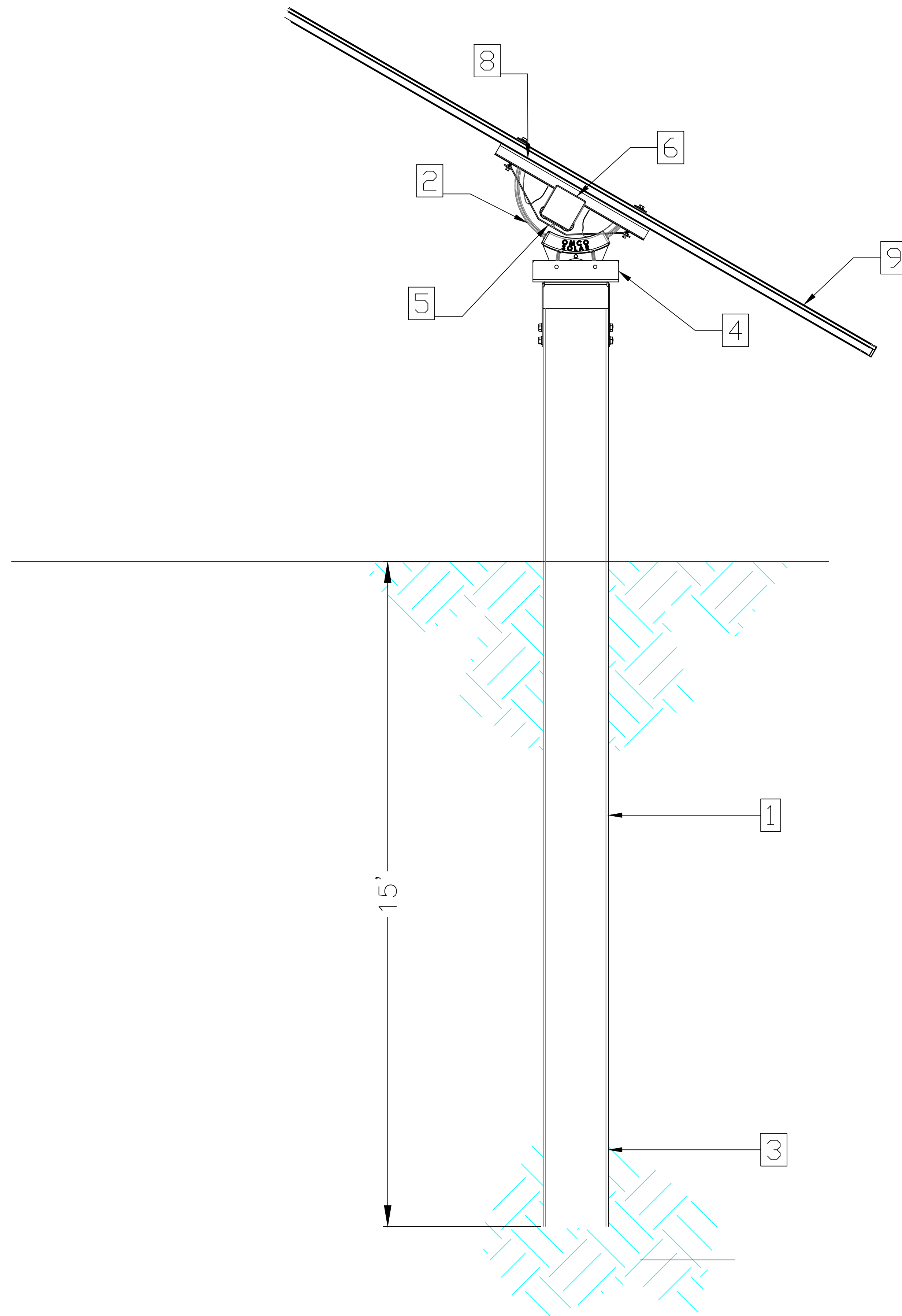
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Scale N/A

Sheet

PV-3.2

FINAL ASSEMBLY



Item	Component	Purpose	Quantity Per Tracker
1	Drive Post	Mounts the Slew Drive and journal assemblies	1
2	Slew Drive and Motor	Rotates the tracker	1
3	Bearing Post	Mounts the bearing assemblies	Varies
4	Bearing Assembly	Allows the rotation of the torque tube	Varies
5	Journal Assembly	Connects the drive unit to torque tubes	2
6	Torque Tube	Connects all the module mounts together	Varies
7	Tracker Controller Unit	Provides power to motor / slew drive unit	1
8	Module Mount	Supports the PV modules	Varies
9	PV Modules	Generate power	Varies
10	Splice	Connects adjacent torque tubes	Varies
11	Damper and Damper Mount	Helps control tracker motion during high wind	Varies

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PV-3.3

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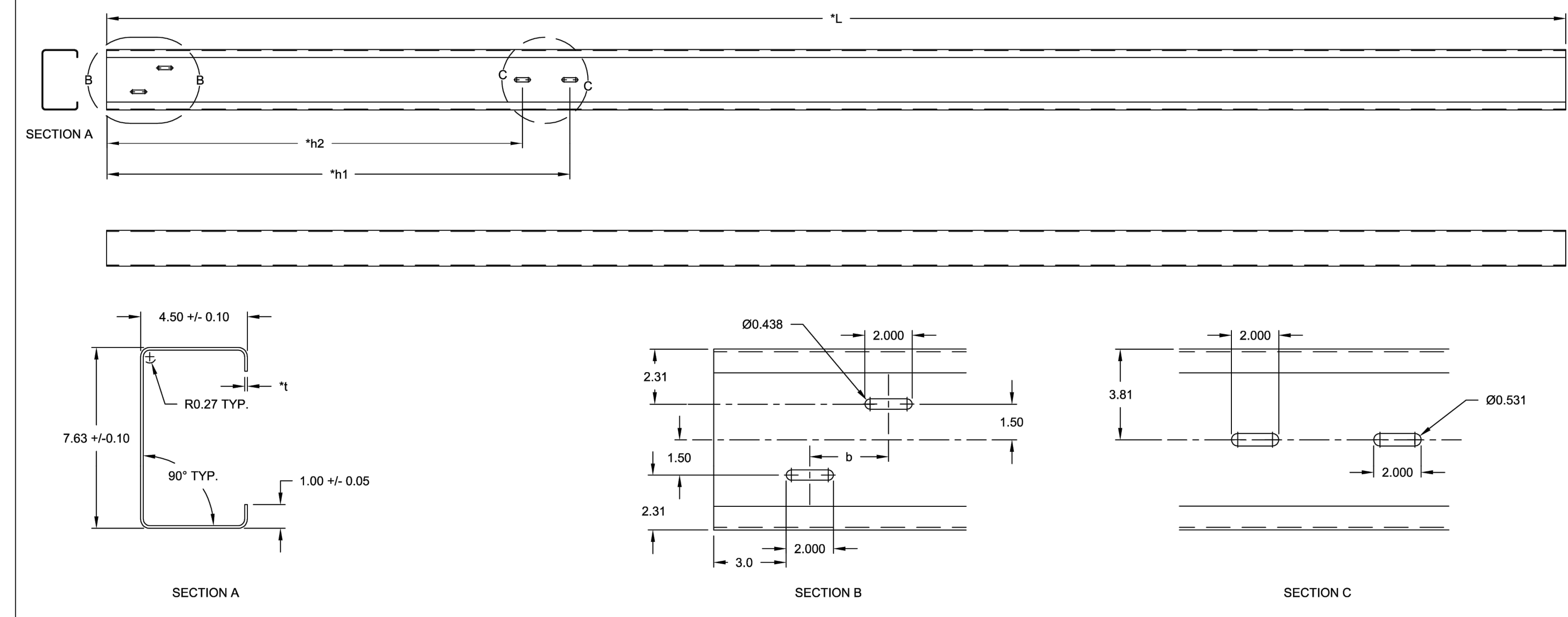
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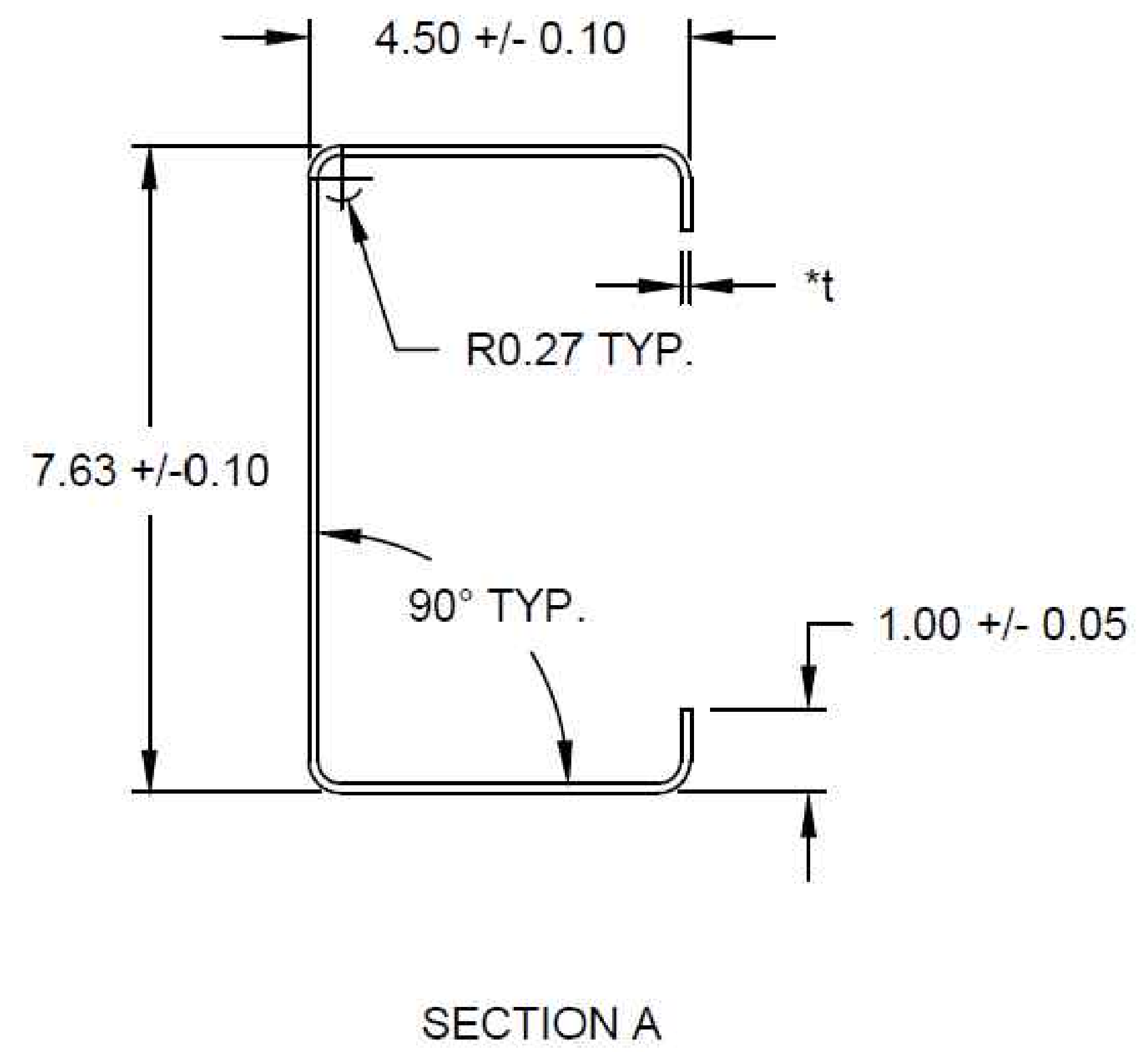
PV-3.4

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COMPLEXITY CHART							
PART NUMBER	THICKNESS (t)	SOUTH DIAG (h1)	NORTH DIAG (h2)	TILT SPACING (b)	LENGTH (L)	GALVANIZATION	MIN Fy / Fu (KSI)
P100-00	0.145	46.61	40.61	3.32	184.61	G235	5770



NOTE:
FINAL LOAD TEST FOR FS SERIES 6 PV
MODULES WILL DETERMINE THE OPTIMIZED 400MM
SPACED BOLTING LOCATION PER MANUFACTURER



1 OMCO SINGLE-AXIS TRACKER - DETAIL

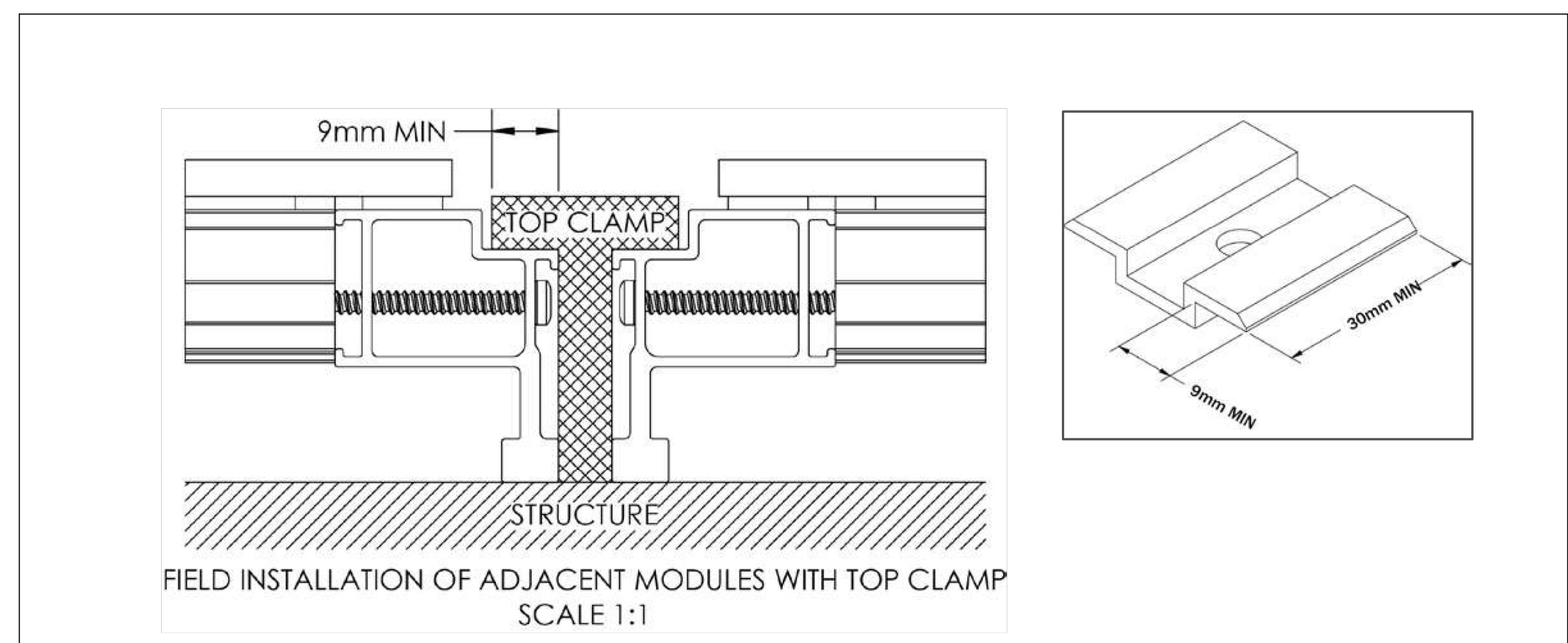


Figure 6: Shared Top Clamp Detail on Series 6 Modules

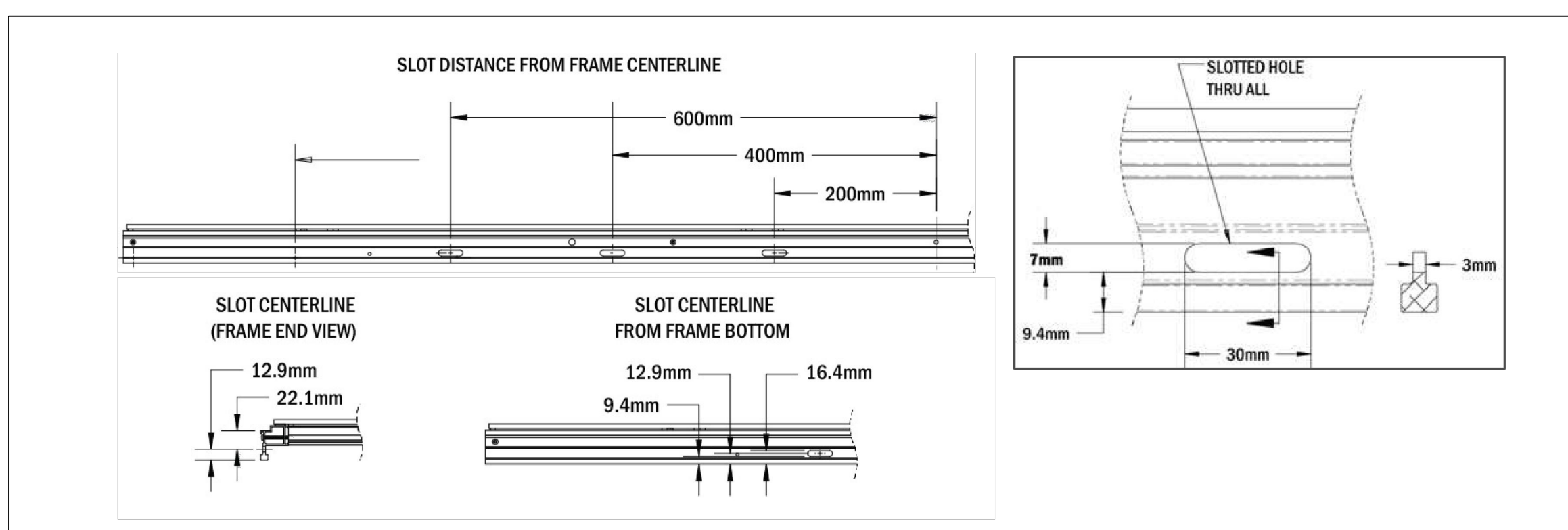


Figure 7: SpeedSlot Detail on Series 6 Module Long Edge Frame

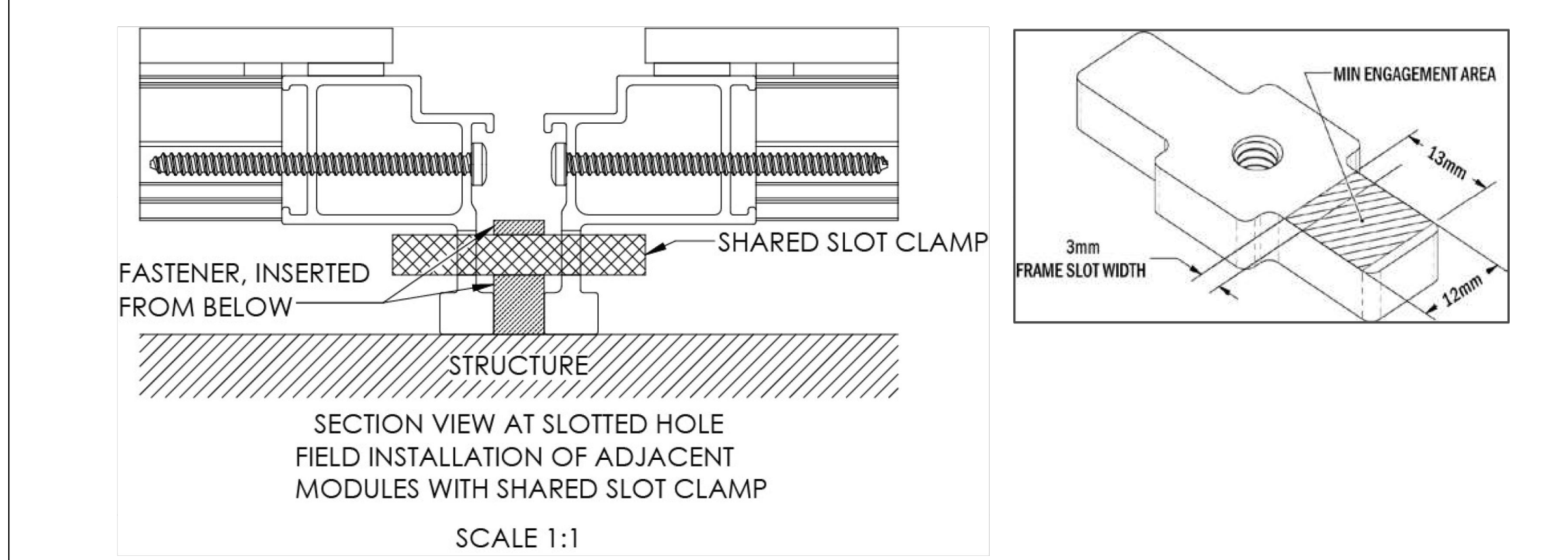


Figure 8: Shared SpeedSlot Clamp Detail on Series 6 Modules

2 PV MODULE TOP MOUNT - DETAIL

3 PV MODULE SPEEDSLOT MOUNT - DETAIL

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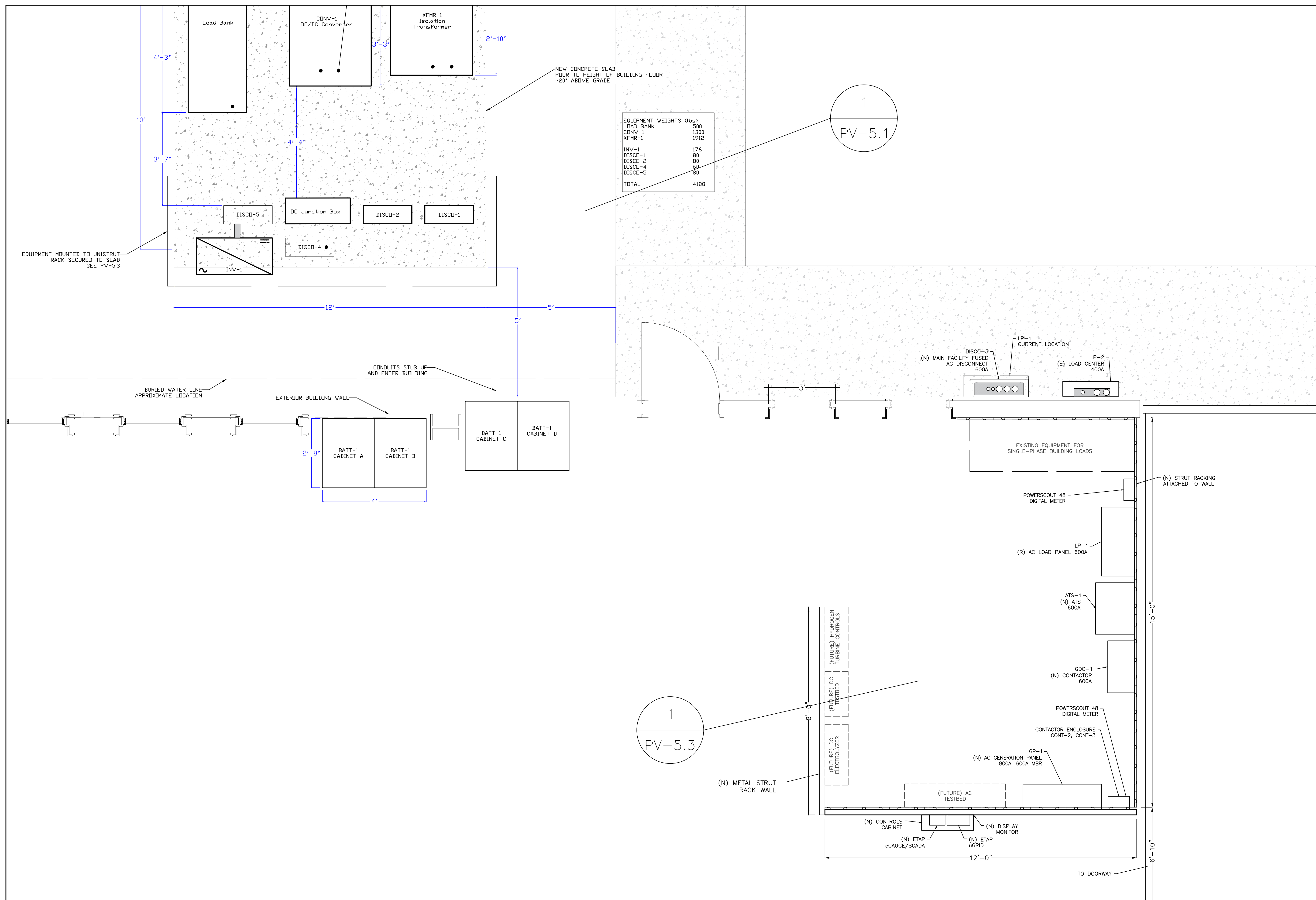
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PV-5.0

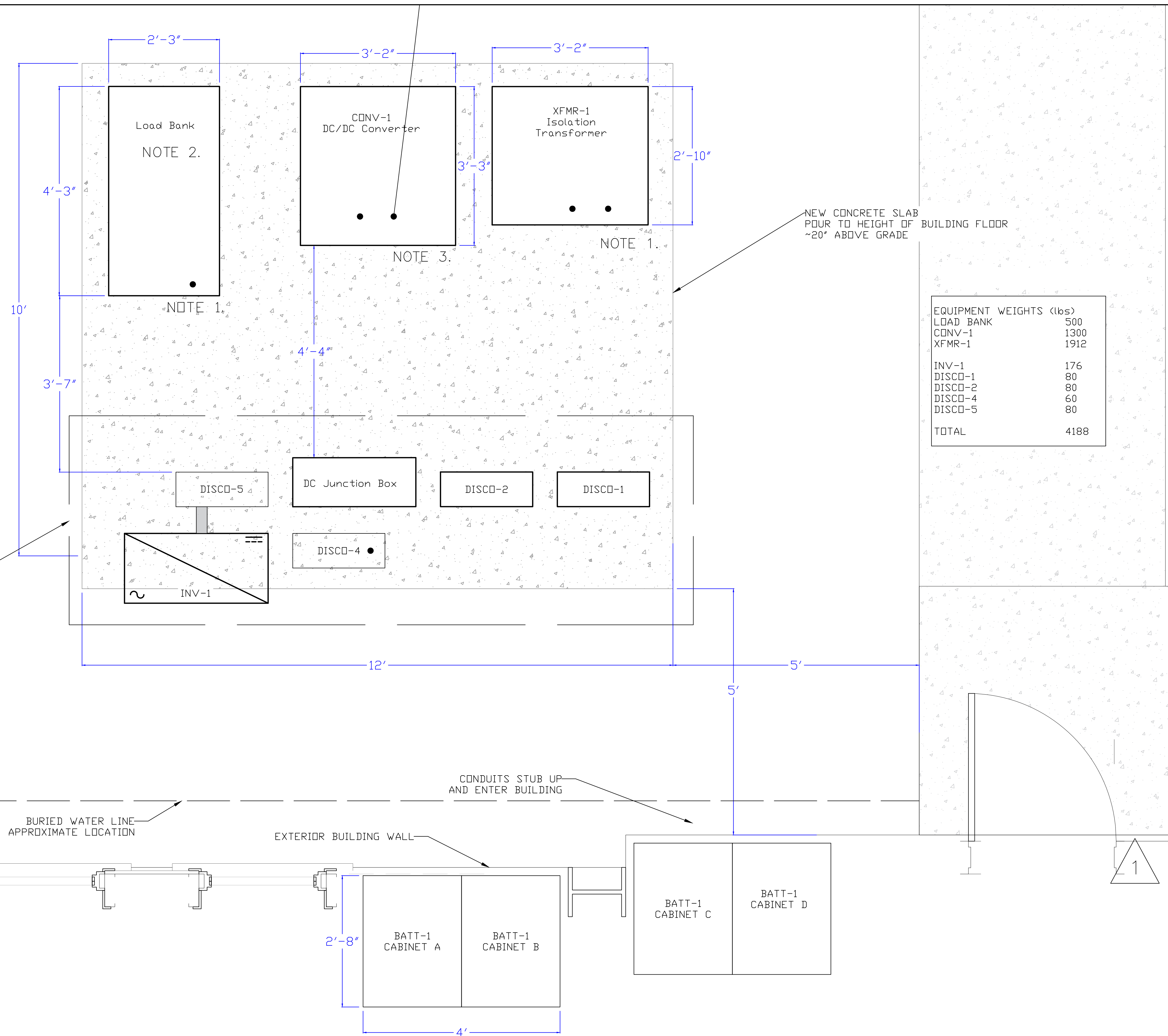
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- NOTE 1. MIN. CLEARANCE OF 8 FT. REQUIRED FROM EXHAUST AND INTAKE SCREENS TO ANY OBSTRUCTION
- NOTE 2. EXHAUST LOUVER
- NOTE 3. CONTRACTOR TO VERIFY CONDUIT ENTRY WINDOWS
- NOTE 4. INSTALL EQUIPMENT ANCHORS PER MANUFACTURER SPECIFICATIONS

SEE PV-5.2, PV-5.3, PV-7.0 AND STAMPED STRUCTURAL PLANS FOR ADDITIONAL DETAILS

EQUIPMENT MOUNTED TO UNISTRUT RACK SECURED TO SLAB SEE PV-5.3



EQUIPMENT WEIGHTS (lbs)	
LOAD BANK	500
CONV-1	1300
XFMR-1	1912
INV-1	176
DISCO-1	80
DISCO-2	80
DISCO-4	60
DISCO-5	80
TOTAL	4188

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Project Name and Address

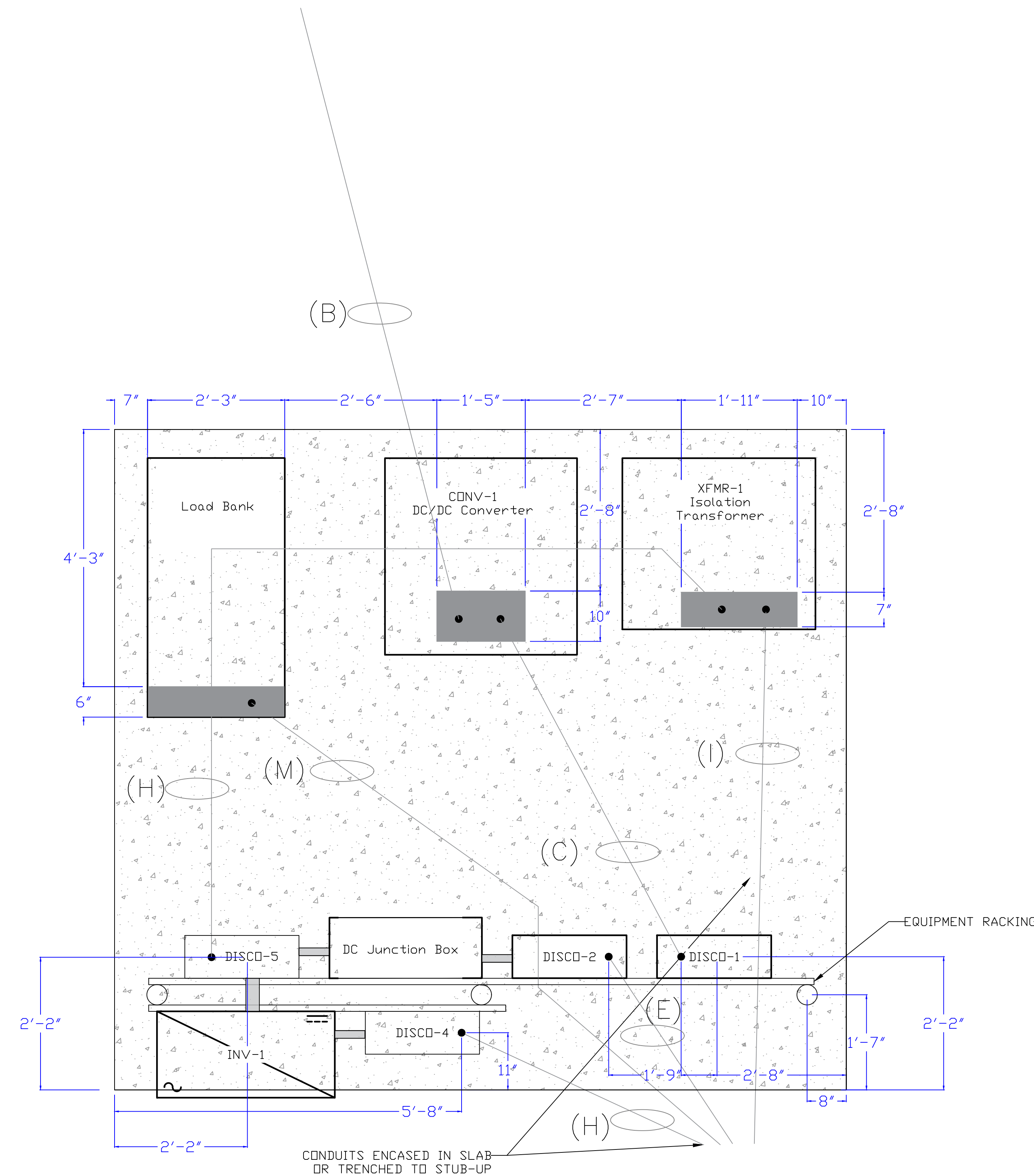
UNIVERSITY OF LOUISIANA AT
 LAFAYETTE-CLECO POWER
 2008 HUTCHINSON AVE
 CROWLEY, LA 70526

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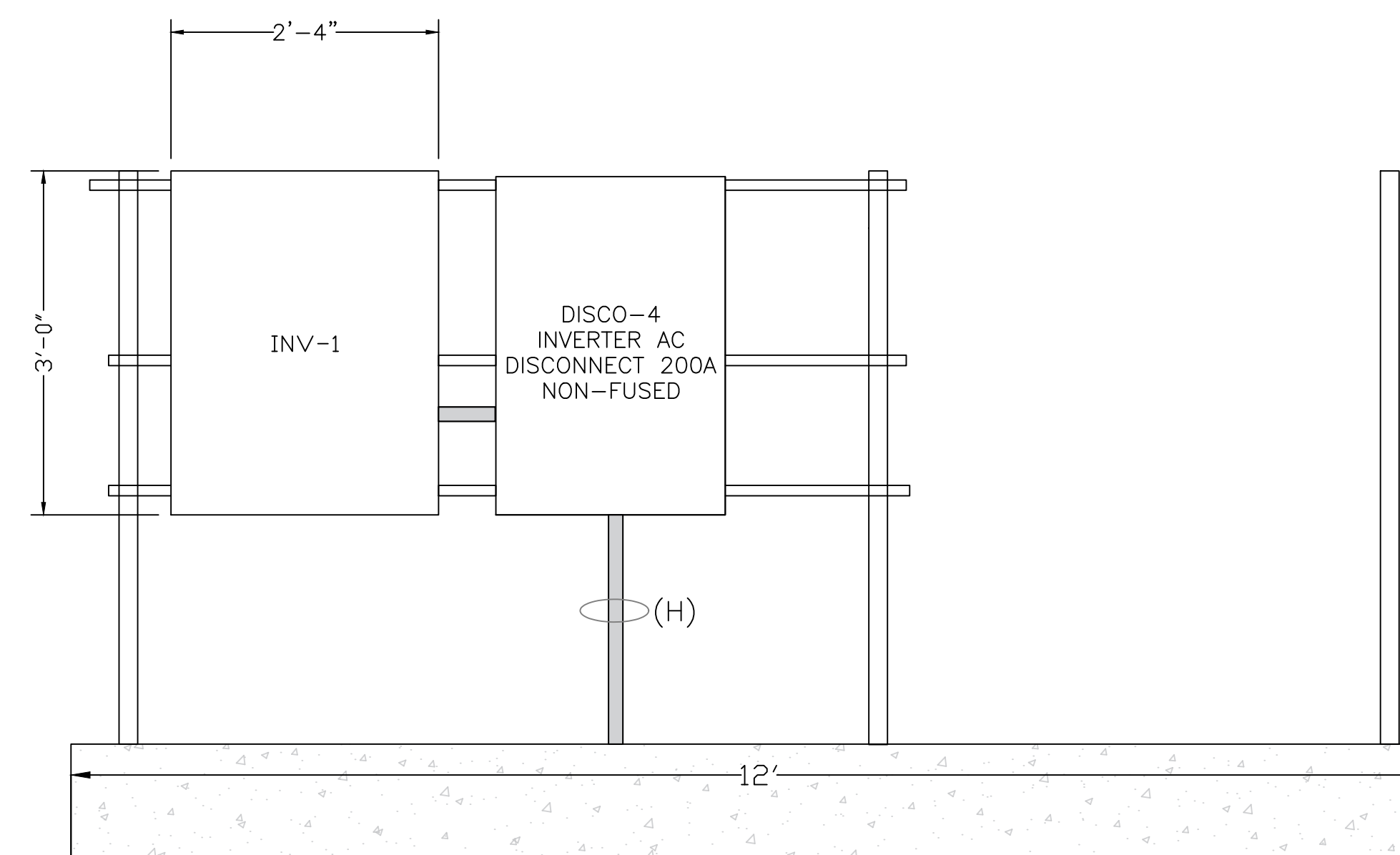
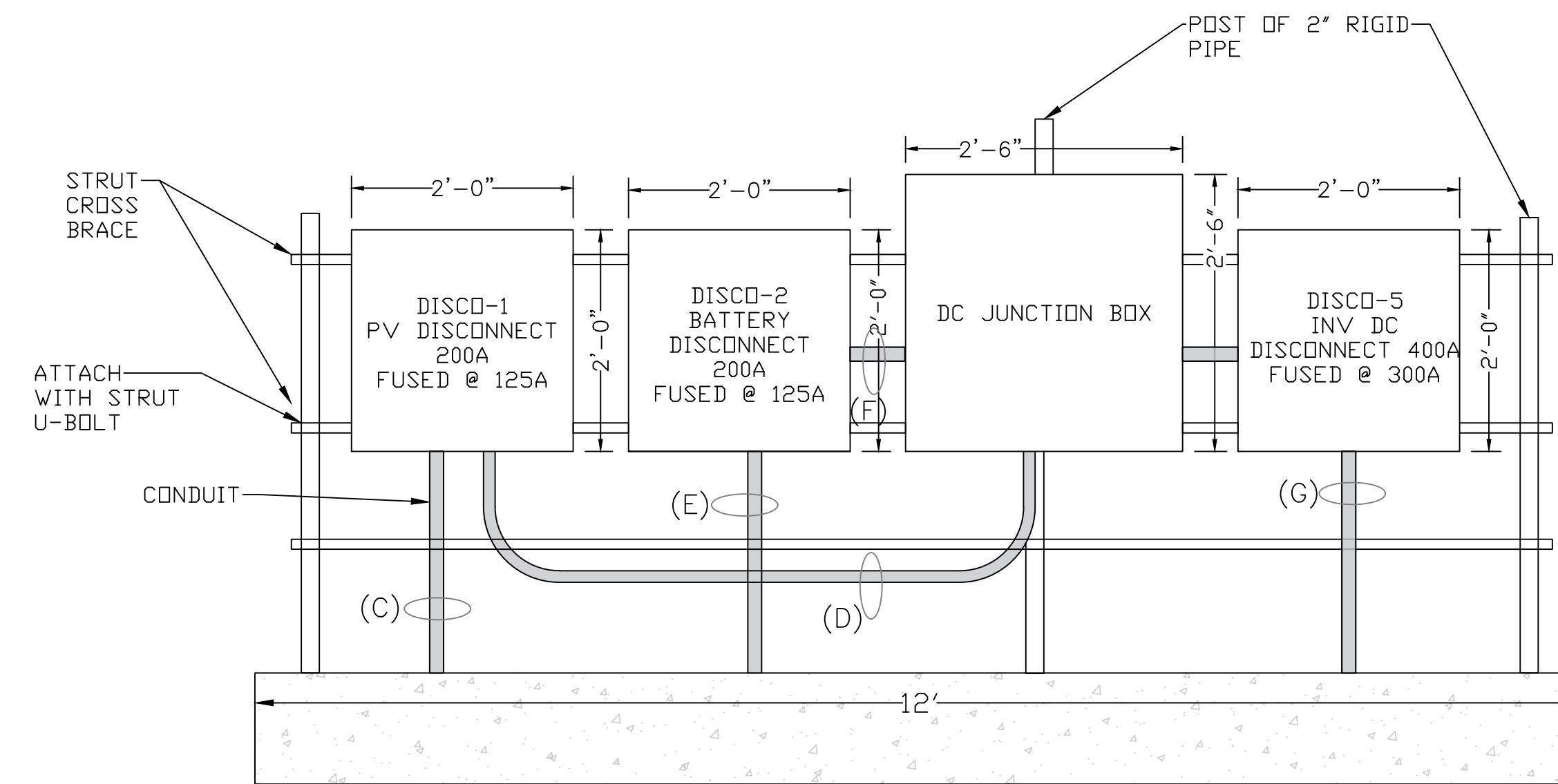
PV-5.1

CONDUIT PLAN



SEE PV-5.1, PV-5.3, PV-7.0 AND STAMPED
STRUCTURAL PLANS FOR ADDITIONAL DETAIL

EQUIPMENT RACK ELEVATION



SEE PV-5.1, PV-5.3, PV-7.0 AND STAMPED
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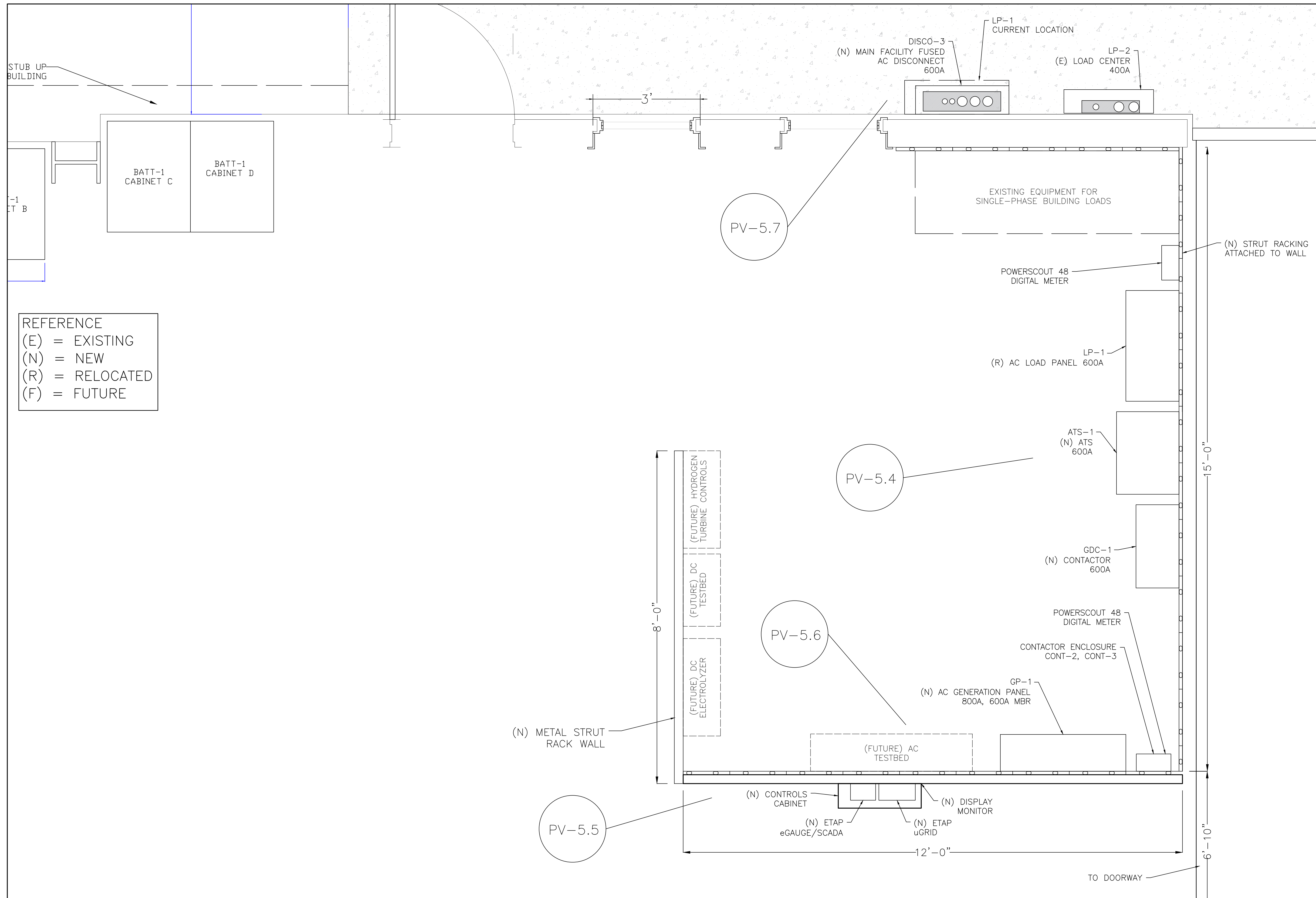
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PAD DETAILS



REFERENCE
 (E) = EXISTING
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 (R) = RELOCATED
 (F) = FUTURE

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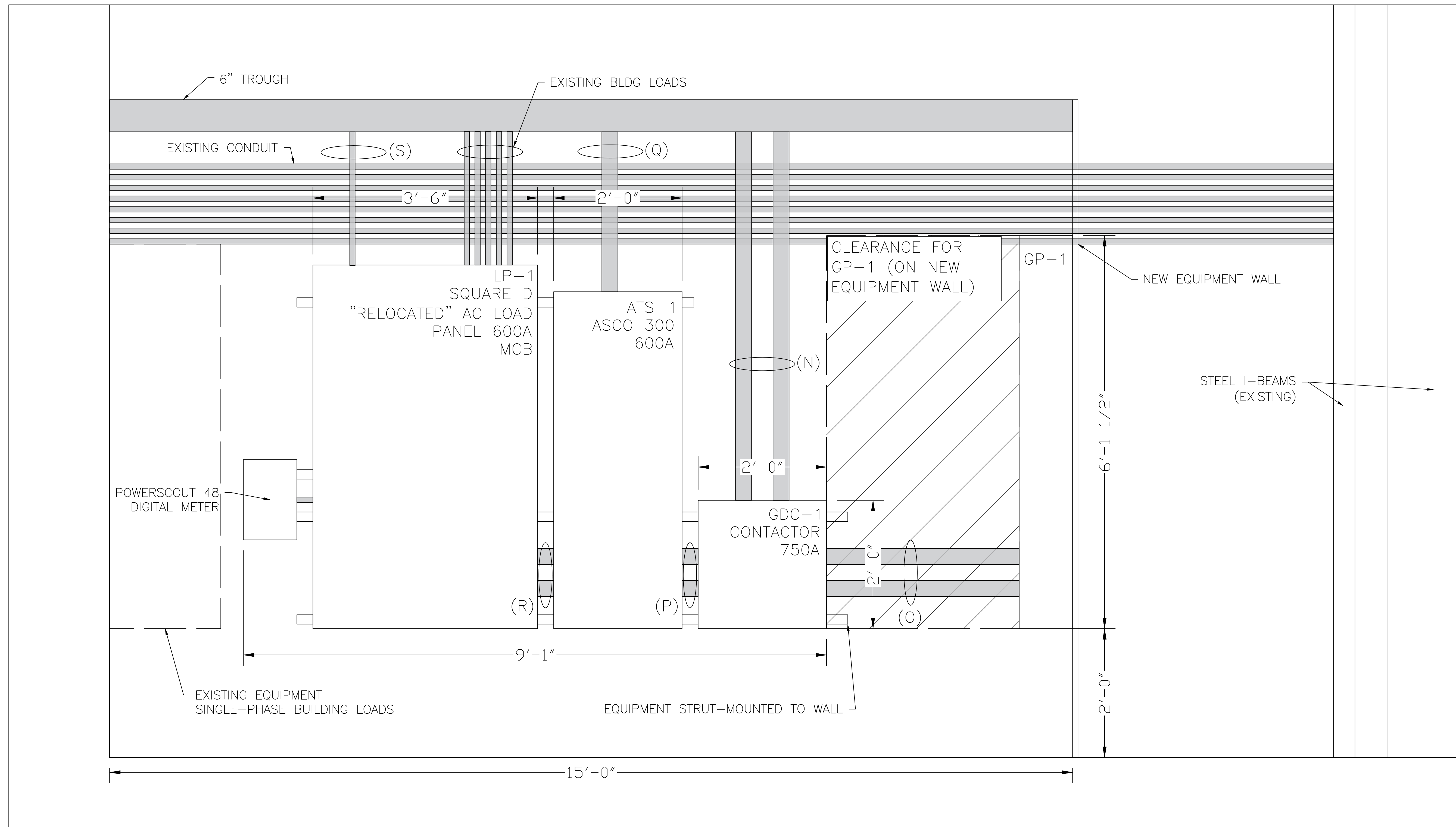
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EAST WALL



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Date
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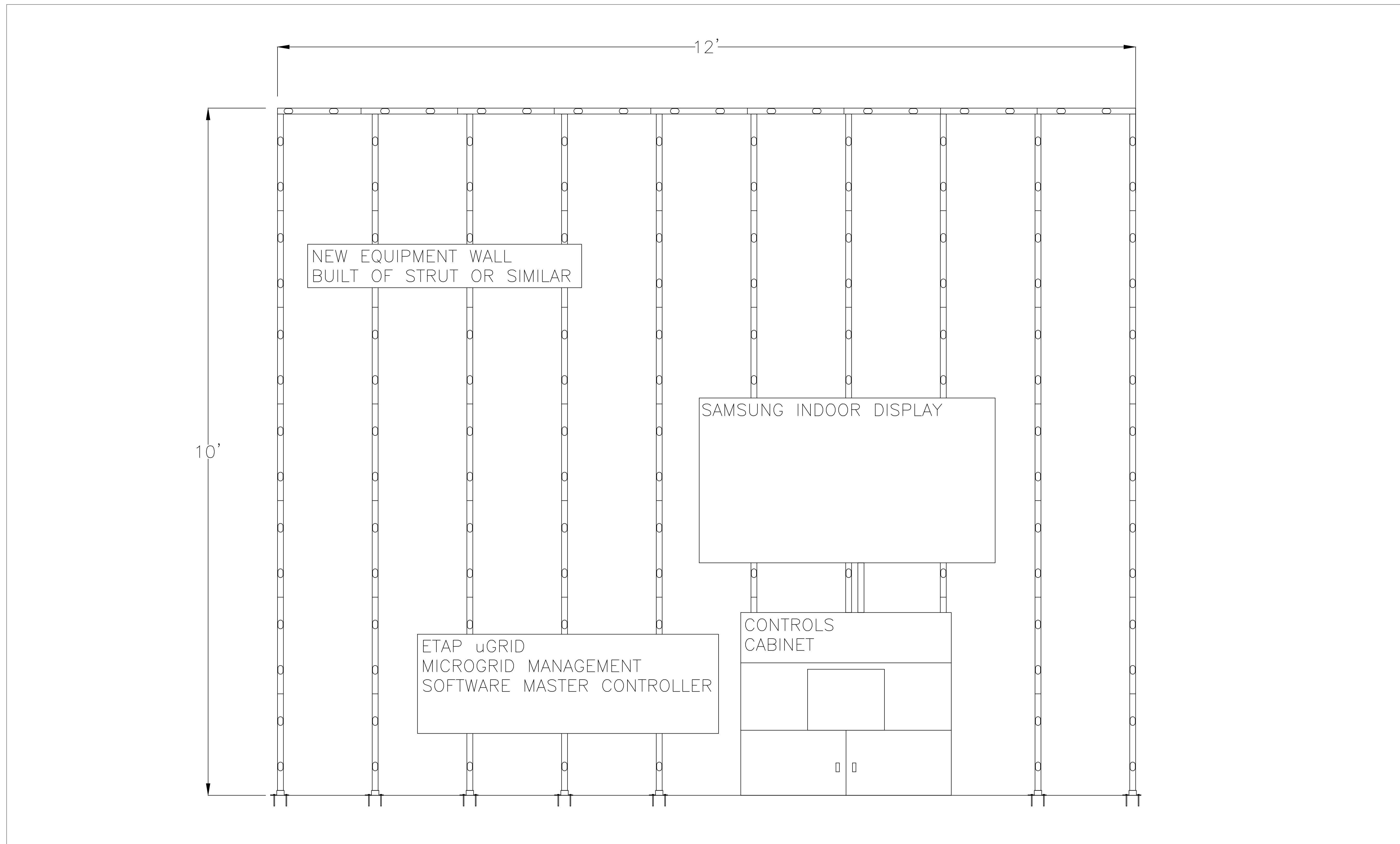
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NEW EQUIPMENT WALL (SOUTH SIDE)



5804 River Oaks Rd S
 Elmwood, LA 70123
 1-504-267-1660



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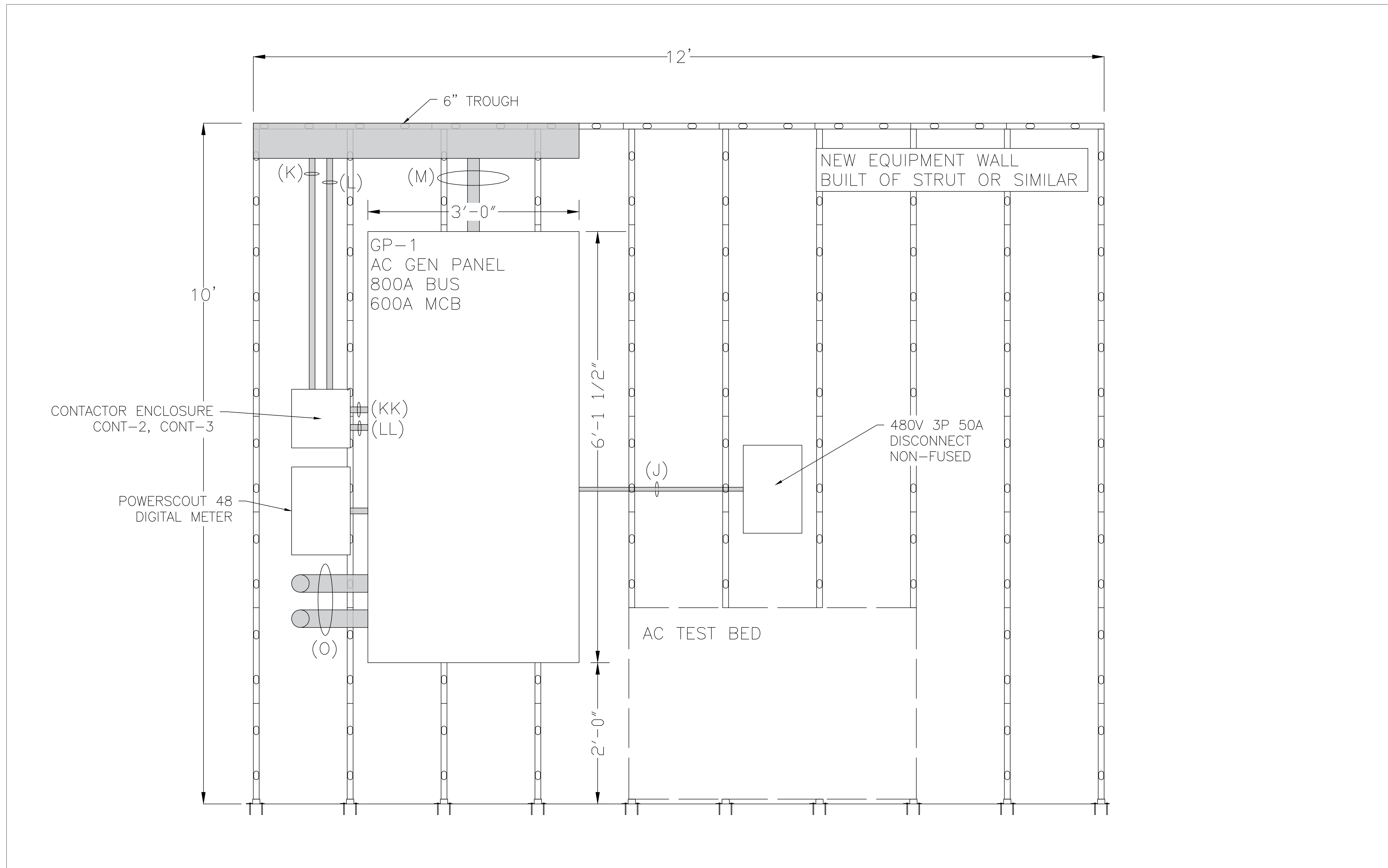
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NEW EQUIPMENT WALL (NORTH SIDE)



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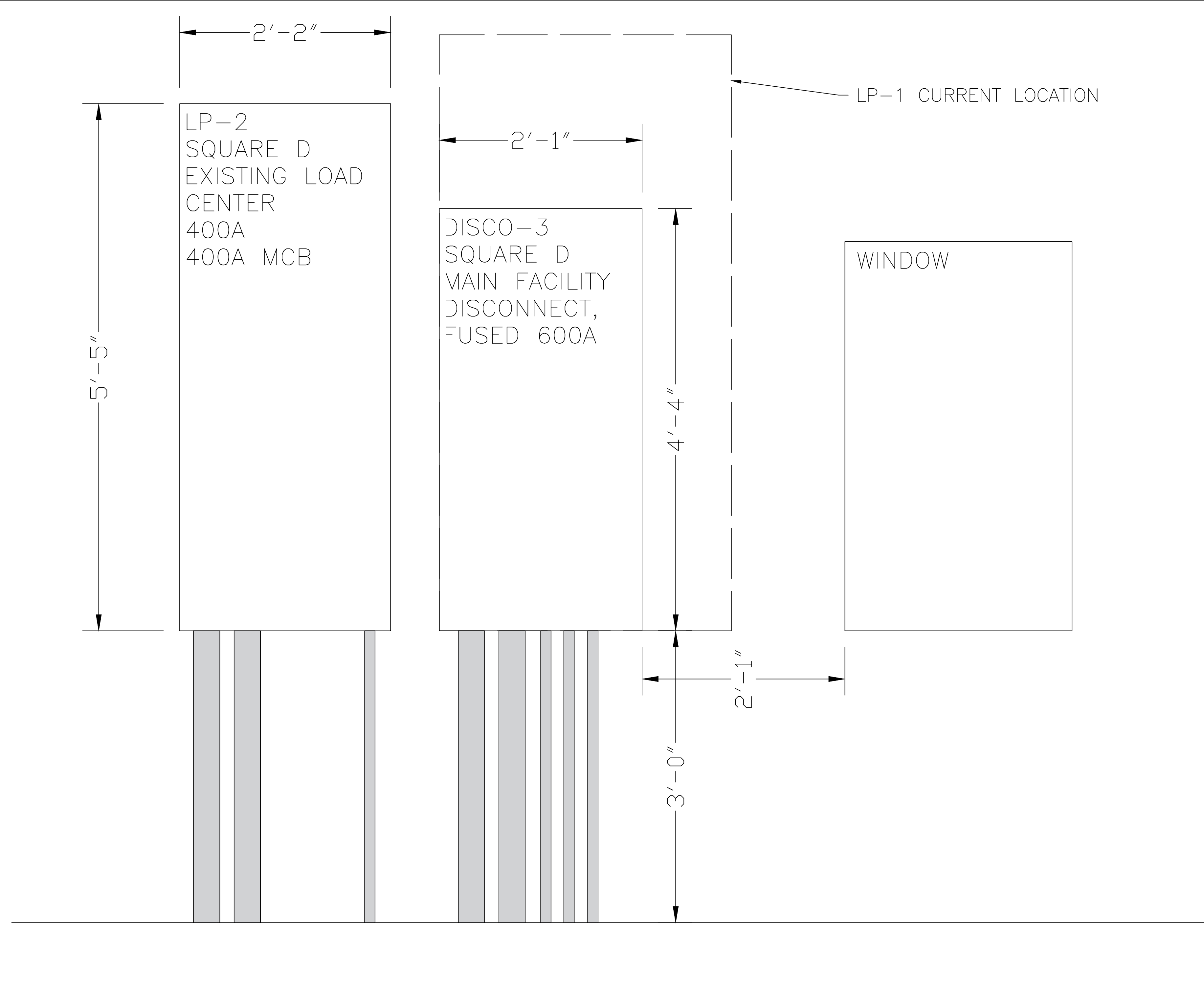
Scale
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OUTDOOR WALL



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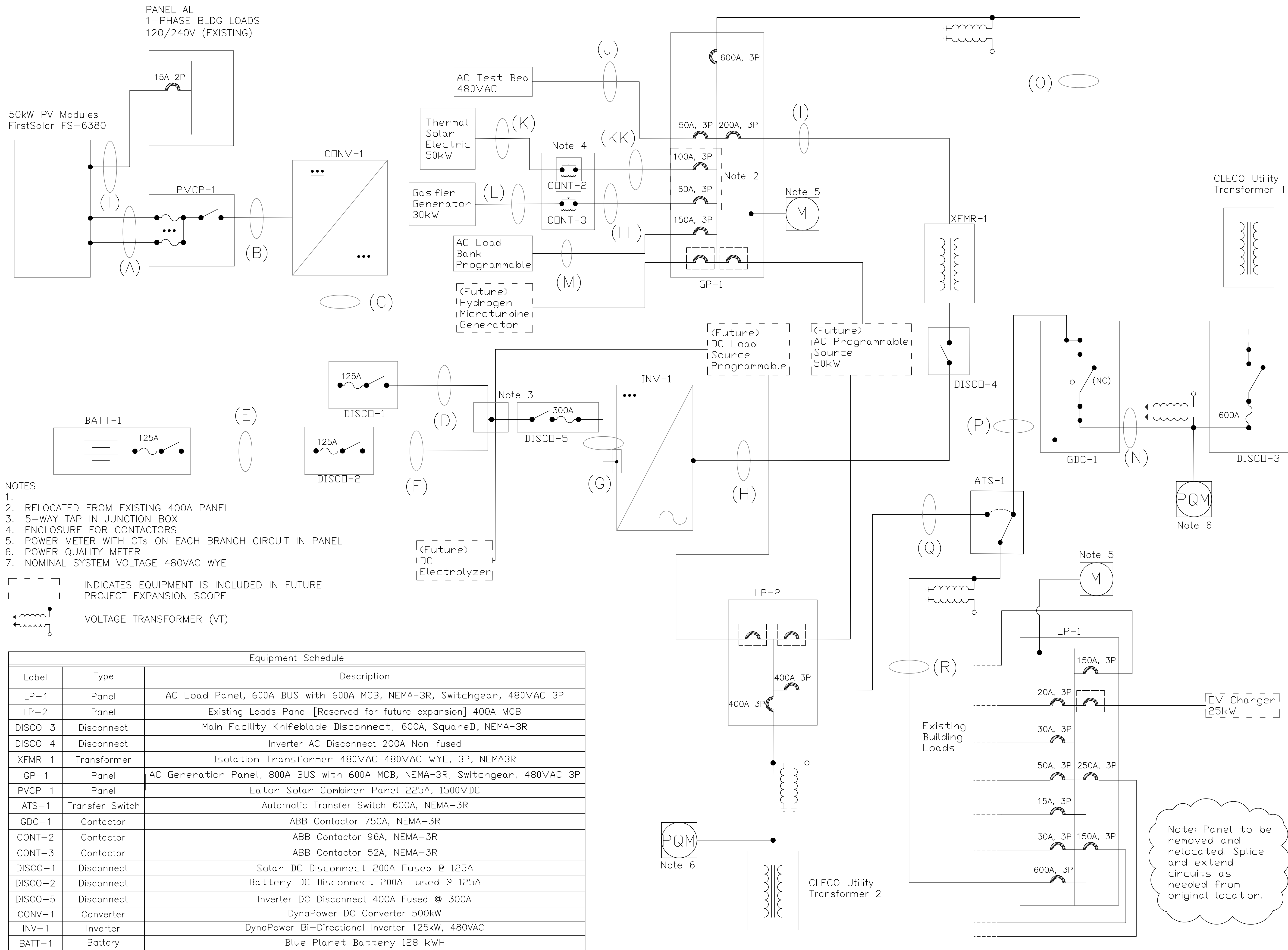
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Sheet
 PV-5.7



- NOTES**
1. RELOCATED FROM EXISTING 400A PANEL
 2. RELOCATED FROM EXISTING 400A PANEL
 3. 5-WAY TAP IN JUNCTION BOX
 4. ENCLOSURE FOR CONTACTORS
 5. POWER METER WITH CTs ON EACH BRANCH CIRCUIT IN PANEL
 6. POWER QUALITY METER
 7. NOMINAL SYSTEM VOLTAGE 480VAC WYE

INDICATES EQUIPMENT IS INCLUDED IN FUTURE PROJECT EXPANSION SCOPE

VOLTAGE TRANSFORMER (VT)

Equipment Schedule		
Label	Type	Description
LP-1	Panel	AC Load Panel, 600A BUS with 600A MCB, NEMA-3R, Switchgear, 480VAC 3P
LP-2	Panel	Existing Loads Panel [Reserved for future expansion] 400A MCB
DISCO-3	Disconnect	Main Facility Knifeblade Disconnect, 600A, SquareD, NEMA-3R
DISCO-4	Disconnect	Inverter AC Disconnect 200A Non-fused
XFMR-1	Transformer	Isolation Transformer 480VAC-480VAC WYE, 3P, NEMA3R
GP-1	Panel	AC Generation Panel, 800A BUS with 600A MCB, NEMA-3R, Switchgear, 480VAC 3P
PVCP-1	Panel	Eaton Solar Combiner Panel 225A, 1500VDC
ATS-1	Transfer Switch	Automatic Transfer Switch 600A, NEMA-3R
GDC-1	Contactors	ABB Contactor 750A, NEMA-3R
CONT-2	Contactors	ABB Contactor 96A, NEMA-3R
CONT-3	Contactors	ABB Contactor 52A, NEMA-3R
DISCO-1	Disconnect	Solar DC Disconnect 200A Fused @ 125A
DISCO-2	Disconnect	Battery DC Disconnect 200A Fused @ 125A
DISCO-5	Disconnect	Inverter DC Disconnect 400A Fused @ 300A
CONV-1	Converter	DynaPower DC Converter 500kW
INV-1	Inverter	DynaPower Bi-Directional Inverter 125kW, 480VAC
BATT-1	Battery	Blue Planet Battery 128 kWh

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Date: 09/15/2022
Scale: N/A
Sheet: PV-6.0

Module Specifications: First Solar FS-6380A	
Nominal Power	380 W
TEMP CoEFF (VOC)	-0.35 %/°C
VMP	171.6 V
IMP	2.21 A
VOC	213.8 V
ISC	2.48 A
Height	79"
Width	49"
Depth	2"
Max Series Fuse	6 A
Max System Volt	1500 V

Inverter Specifications:	Dynapower MPS-125
Max DC Input Power	125 kW
Max DC Input Current	171 A
Max AC Output Power	125 kW
AC Output Current	80 A
Max DC Voltage	1500 V
DC Operating Voltage	740-1500 V
AC Nominal Voltage	480 VAC 3-Ph

String Max Voltage Calculation:

$$\text{Voc temperature adjustment at } -4^{\circ}\text{C} =$$

$$1 - [\text{BVoc} * \Delta\text{T}]/100$$

$$1 - [-0.35 \text{ \%/}^{\circ}\text{C} * (25^{\circ}\text{C} - (-4^{\circ}\text{C}))]/100$$

$$1.0928$$

$$\text{Voc @ } -4^{\circ}\text{C} =$$

$$\text{Voc @ } 25^{\circ}\text{C} * \text{temp adjustment factor}$$

$$213.8 \text{ V} * 1.0928$$

$$233.6406 \text{ V}$$

$$\text{Max String Length} =$$

$$\text{Max Voltage} / \text{Temp adjusted Voc}$$

$$1500 \text{ V} / 233.64 \text{ V}$$

$$6.4 \text{ Modules} = 6 \text{ Modules}$$

General Notes

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Wire Schedule												
Tag	Set	Qty	FLA	OCPD (A)	Size	Type	Ground	V	Length (ft)	Voltage Drop (%)	Conduit	Notes
A	21	22	7	10	CU #12	PV Wire	CU #12	1500	25-300	1.11	Free air	
B	1	2	93		CU 2/0	XHHW-2	CU #8	1500	550	0.59	2" PVC	
C	1	2	85	90	CU #2	XHHW-2	CU #8	1000	15		1" EMT	
D	1	2	85	90	CU #2	XHHW-2	CU #8	1000	15		1" EMT	
E	1	2	150	125	CU #1	XHHW-2	CU #6	1000	30		1-1/4" EMT	
F	1	2	125	125	CU #1	XHHW-2	CU #6	1000	30		1-1/4" EMT	
G	1	2	215	225	CU 4/0	XHHW-2	CU #4	1000	10		2" EMT	
H	1	3	200	200	CU 2/0	THHN	CU #6	480	30		2" EMT	
I	1	3	200	200	CU 2/0	THHN	CU #6	480	100		2" EMT	
J	1	4	50	50	CU #8	THHN	CU #10	480	50		3/4" EMT	
K	1	4	100	100	CU #2	THHN	CU #8	480	300		1" EMT	Note 1
KK	1	4	100	100	CU #2	THHN	CU #8	480	5		1" EMT	
L	1	4	60	60	CU #6	THHN	CU #10	480	200		1" EMT	Note 1
LL	1	4	60	60	CU #6	THHN	CU #10	480	5		1" EMT	
M	1	4	150	150	CU 2/0	THHN	CU #6	480	100		2" EMT	
N	3	4	600	600	CU 3/0	THHN	CU #1	480	10		(2) 3" EMT	
O	3	4	600	600	CU 3/0	THHN	CU #1	480	40		(2) 3" EMT	
P	3	4	600	600	CU 3/0	THHN	CU #1	480	15		(2) 3" EMT	
Q	2	4	400	400	CU 3/0	THHN	CU #2	480	40		3" EMT	
R	3	4	600	600	CU 3/0	THHN	CU #1	480	20		(2) 3" EMT	
T	1	3	7	15	CU #8	THHN	CU #12	240	550	2.57	2" PVC	

Notes

- EXISTING CONDUCTORS. EXTEND FEEDERS TO RELOCATE BREAKERS TO NEW PANEL. MATCH NEW CONDUCTORS & CONDUIT TO EXISTING

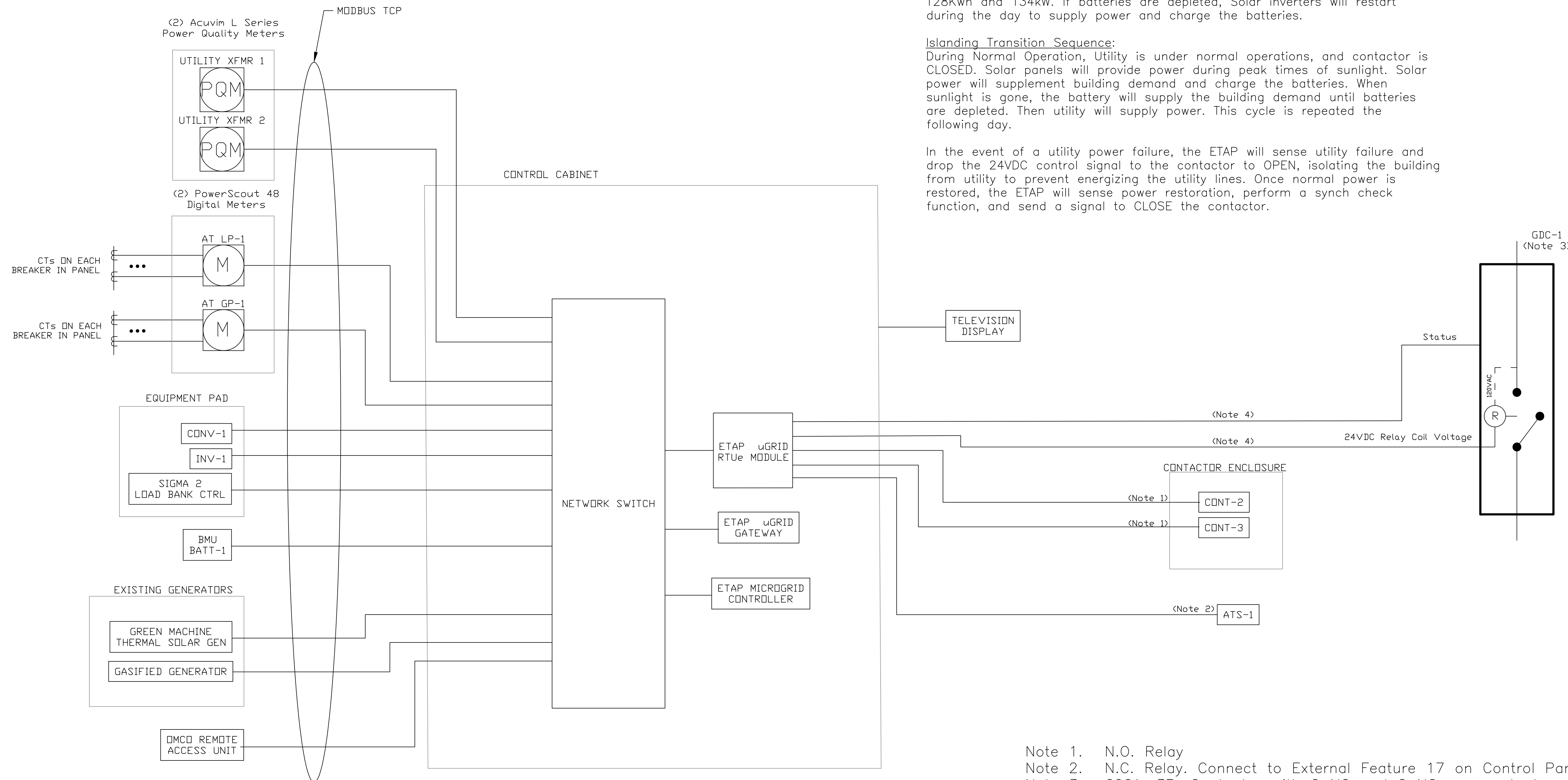
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Scale N/A	

On Grid Operation: During the daytime, the Solar power will supplement utility power to feed the building demand. Batteries will be tied to the system for charging during daytime hours. When Solar power is unavailable, stored battery power will supplement building demand. Once battery power is depleted, utility power will supply the building demand load. Cycle is repeated when sun rises the following day. In this operation, a 24VDC signal will hold the contactor in the CLOSED position.

Off Grid Operation: In the event of utility failure, the ETAP will sense utility failure and will drop the 24VDC signal and OPEN the contactor preventing utility back feed. The building will be supplied from solar inverters and the batteries until and unless batteries are depleted. Batteries are rated for 128Kwh and 134kW. If batteries are depleted, Solar inverters will restart during the day to supply power and charge the batteries.

Islanding Transition Sequence:
During Normal Operation, Utility is under normal operations, and contactor is CLOSED. Solar panels will provide power during peak times of sunlight. Solar power will supplement building demand and charge the batteries. When sunlight is gone, the battery will supply the building demand until batteries are depleted. Then utility will supply power. This cycle is repeated the following day.

In the event of a utility power failure, the ETAP will sense utility failure and drop the 24VDC control signal to the contactor to OPEN, isolating the building from utility to prevent energizing the utility lines. Once normal power is restored, the ETAP will sense power restoration, perform a synch check function, and send a signal to CLOSE the contactor.



- Note 1. N.O. Relay
- Note 2. N.C. Relay. Connect to External Feature 17 on Control Panel
- Note 3. 600A, 3P, Contactor with 2 NO and 2 NC aux contacts.
- Note 4. See PV-07 for electrical requirements.

General Notes

**MICROGRID SYSTEM
WITH GROUND MOUNT PV**

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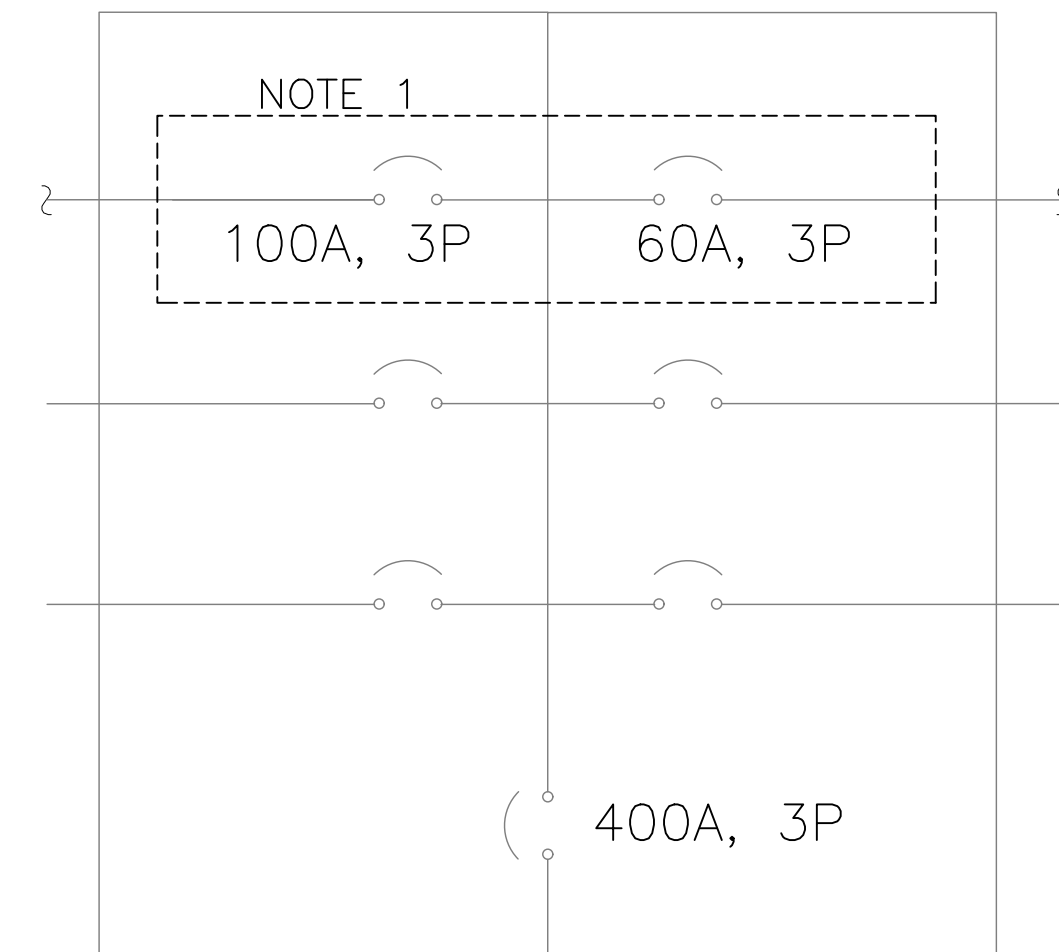
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LP-2
EXISTING OUTPUT SERVICE PANEL
480V, 3P, 4W
400A MCB



EXISTING

LP-2 Existing Output Service Panel Schedule													
Panel Voltage	480	Fed From	Secondary Transformer [500kVA, 3P]					Manufacturer/Model	Square D / I-Line HCN14654M				
Panel Phase/Wire	3P/4W	Panel Type	MCB					Note: Panel to be abandoned with all circuits removed.					
Amp Rating	400	Location /Mounting	Outside/Surface										
CCT No.	Load Type	OCPD	Wire	Conduit	Phase A	Phase B	Phase C	Conduit	Wire	OCPD	Load Type	CCT No.	
1	ORC Generator	100	(3) #3 W/G	1'-1/4"	X			1"	(3) #6 W/G	60	Gas Generator	2	
3												4	
5												6	

NOTES
1. CIRCUITS RELOCATED TO GP-1

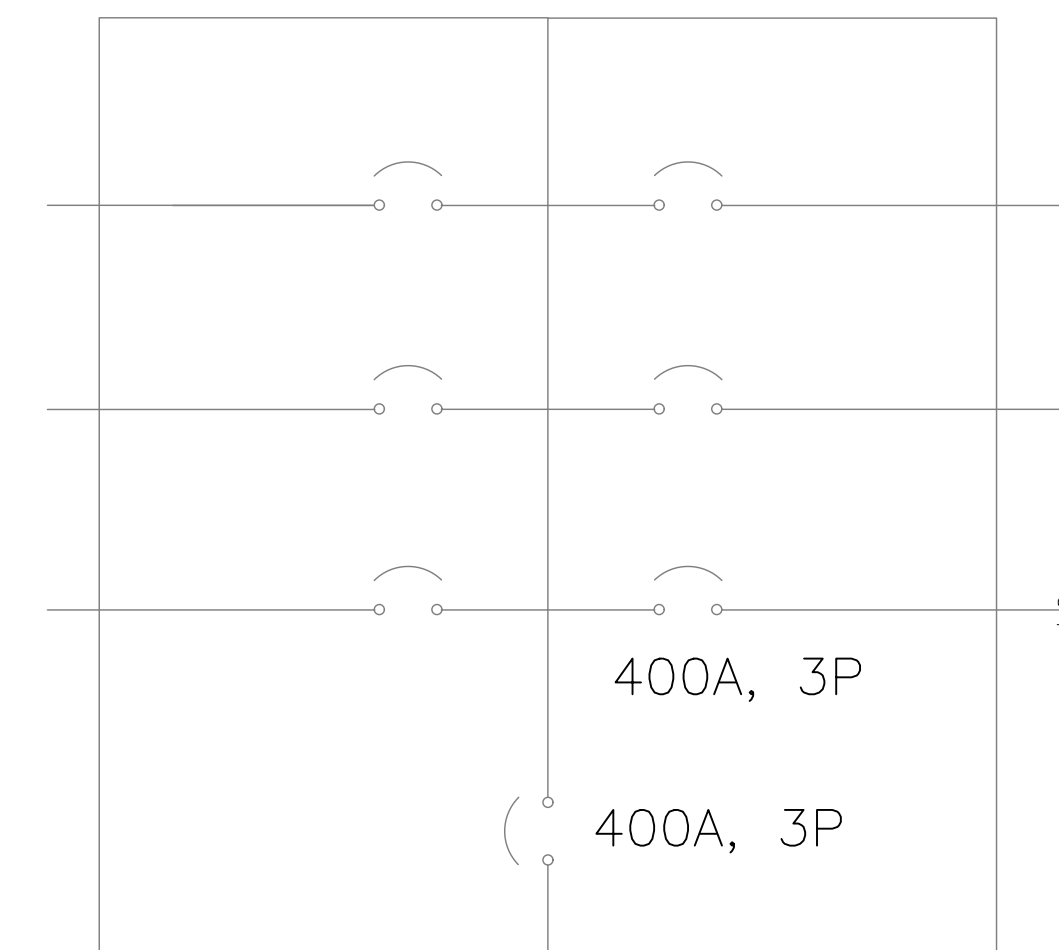
General Notes

MICROGRID SYSTEM WITH GROUND MOUNT PV

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- PV-10.0 EQUIPMENT DATA SHEETS

LP-2
EXISTING OUTPUT SERVICE PANEL
480V, 3P, 4W
400A MCB



PLANNED

LP-2 Existing Output Service Panel Schedule													
Panel Voltage	480	Fed From	Secondary Transformer [500kVA, 3P]					Manufacturer/Model	Square D / I-Line HCN14654M				
Panel Phase/Wire	3P/4W	Panel Type	MCB					Note: Panel to be abandoned with all circuits removed.					
Amp Rating	400	Location /Mounting	Outside/Surface										
CCT No.	Load Type	OCPD	Wire	Conduit	Phase A	Phase B	Phase C	Conduit	Wire	OCPD	Load Type	CCT No.	
1												2	
3												4	
5								3"	(8) #2 W/G	400	Secondary Service	6	

Revisions		
No.	Issue	Date
110822	REVIEW	
120222	REVIEW	
121222	REVIEW	
122022	REVIEW	
090823	BID SET	
092023	PAD UPDATE	

Project Name and Address

UNIVERSITY OF LOUISIANA AT LAFAYETTE-CLECO POWER
2008 HUTCHINSON AVE
CROWLEY, LA 70526

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Andrea Lee, Nick Boyd

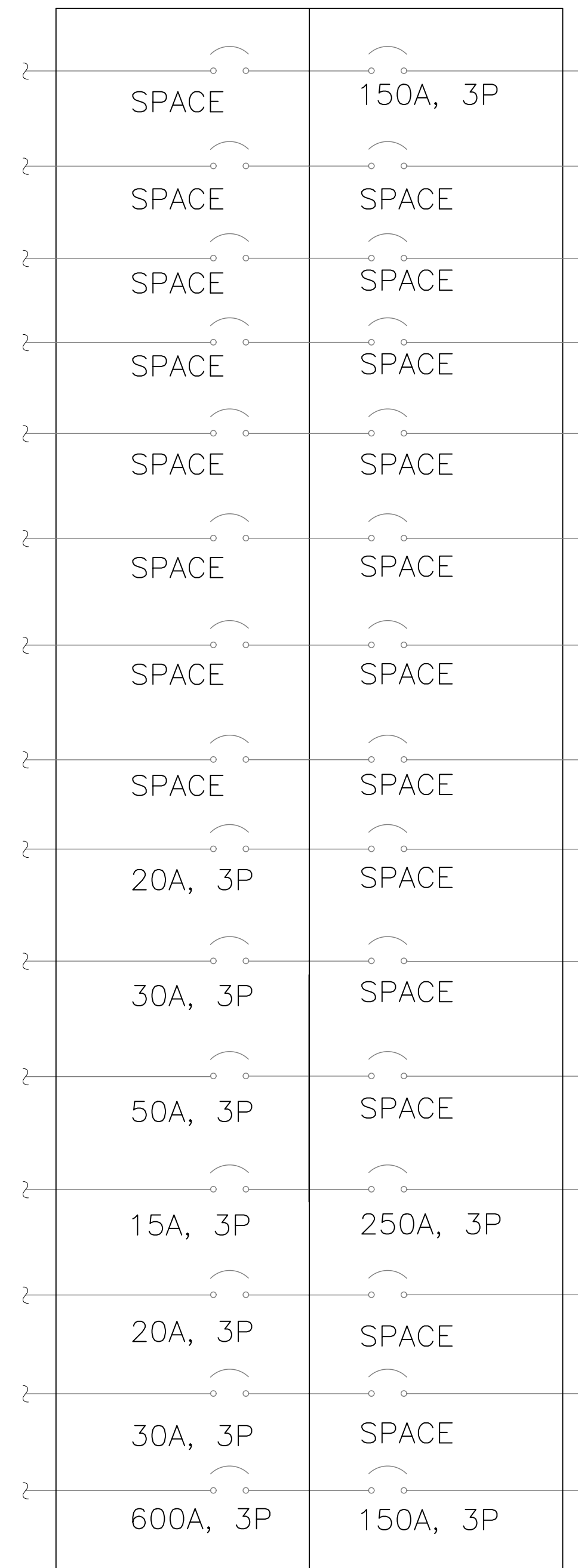
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PV-9.0

LP-1
EXISTING LOAD PANEL, RELOCATED
480V, 3P, 4W 600A MCB



EXISTING

M												
Panel Voltage	480	Fed From	Secondary Transformer [500kVA, 3P]				Manufacturer/Model	Square D / I-Line HCP 11253				
Panel Phase/Wire	3P/4W	Panel Type	MCB				Note: Panel to be disconnected carefully and relocated into the building, hung on adjacent wall, and labeled "AC Load Panel"					
Amp Rating	600	Location /Mounting	Outside/Surface									
CCT No.	Load Type	OCPD	Wire	Conduit	Phase A	Phase B	Phase C	Conduit	Wire	OCPD	Load Type	CCT No.
1	Space				X			1'-1/4"	(3) #2 W/G	150	Transformer (75kVA, 120/208)	2
3	"					X					"	4
5	"						X				"	6
7	Space				X						Space	8
9	"					X					"	10
11	"						X				"	12
13	Space				X						Space	14
15	"					X					"	16
17	"						X				"	18
19	Lab AH	20	(3) #12 W/G	1/2"	X						Space	20
21	"					X					"	22
23	"						X				"	24
25	Office AH	30	(3) #10 W/G	3/4"	X						Space	26
27	"					X					"	28
29	"						X				"	30
31	Lab AH - Hood Unit	50	(3) #8 W/G	3/4"	X						Space	32
33	"					X					"	34
35	"						X				"	36
37	Compressor	15	(3) #12 W/G	1/2"	X			2'-1/4"	(4) 250 MCM W/G	250	Panel "AH"	38
39	"					X					"	40
41	"						X				"	42
43	Compressor	20	(3) #12 W/G	1/2"	X						Space	44
45	"					X					"	46
47	"						X				"	48
49	Compressor	30	(3) #10 W/G	1/2"	X						Space	50
51	"					X					"	52
53	"						X				"	54
55	Main	600	(4) #3 W/G	3/4"	X			1'-1/4"	(3) #2 W/G	150	unknown	56
57	"					X					"	58
59	"						X				"	60

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WITH GROUND MOUNT PV

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Project Name and Address
 UNIVERSITY OF LOUISIANA AT LAFAYETTE-CLECO POWER
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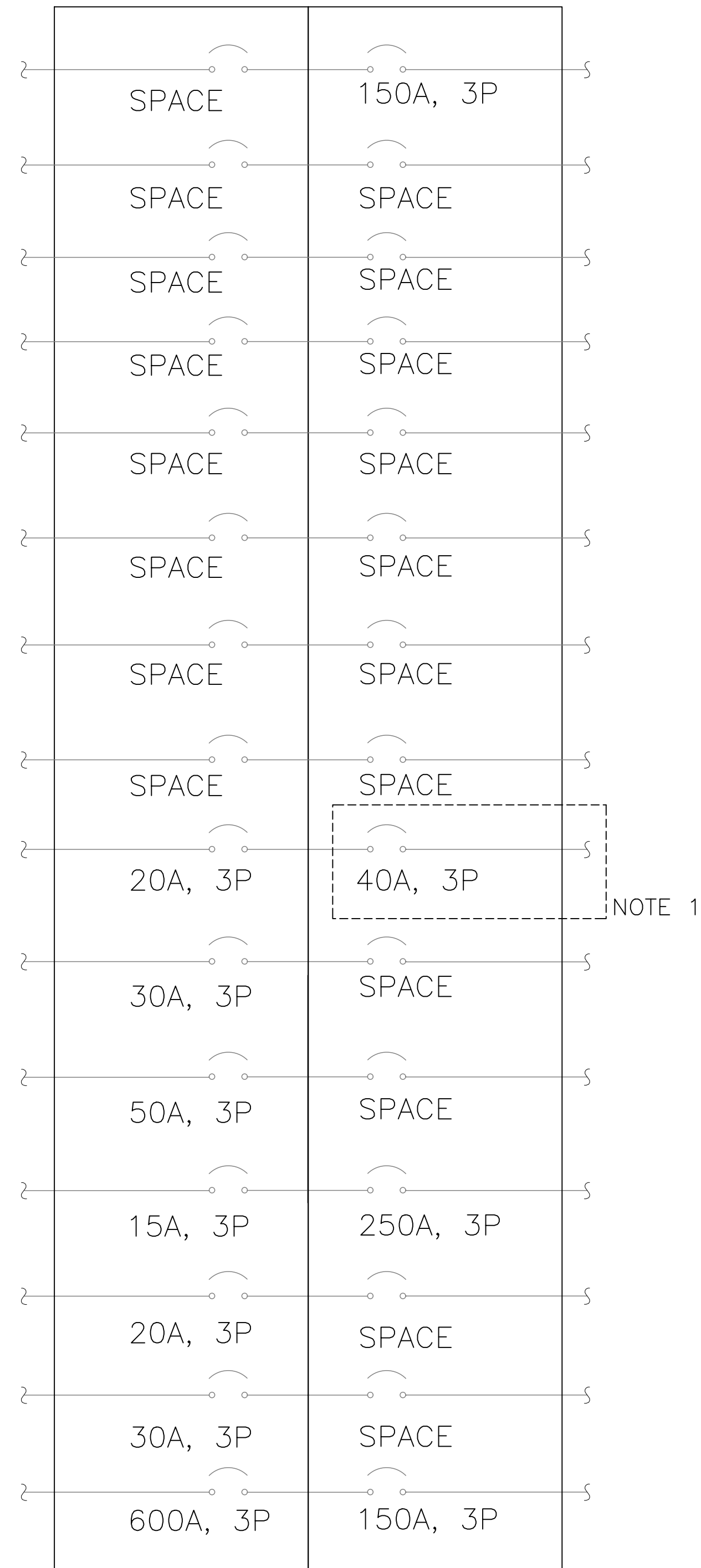
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09/15/2022

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PV-9.1

LP-1
EXISTING LOAD PANEL, RELOCATED
480V, 3P, 4W 600A MCB



New AC Load Panel "LP-600" Schedule

Panel Voltage	480	Fed From	Secondary Transformer [500kVA, 3P]			Manufacturer/Model	Square D / I-Line HCP 11253					
Panel Phase/Wire	3P/4W	Panel Type	MCB			Note: Former "Input Service" Panel.						
Amp Rating	600	Location /Mounting	Inside/Surface									
CCT No.	Load Type	OCPD	Wire	Conduit	Phase A	Phase B	Phase C	Conduit	Wire	OCPD	Load Type	CCT No.
1	Space				X			1'-1/4"	(3) #2 W/G	150	Transformer (75kVA, 120/208)	2
3	"					X					"	4
5	"						X				"	6
7	Space				X						Space	8
9	"					X					"	10
11	"						X				"	12
13	Space				X						Space	14
15	"					X					"	16
17	"						X				"	18
19	Lab AH	20	(3) #12 W/G	1/2"	X						Space	20
21	"					X					"	22
23	"						X				"	24
25	Office AH	30	(3) #10 W/G	3/4"	X			3/4"	(4) #8 W/G	40	EV Charger	26
27	"					X					"	28
29	"						X				"	30
31	Lab AH - Hood Unit	50	(3) #8 W/G	3/4"	X						Space	32
33	"					X					"	34
35	"						X				"	36
37	Compressor	15	(3) #12 W/G	1/2"	X			2'-1/4"	(4) 250 MCM W/G	250	Panel "AH"	38
39	"					X					"	40
41	"						X				"	42
43	Compressor	20	(3) #12 W/G	1/2"	X						Space	44
45	"					X					"	46
47	"						X				"	48
49	Compressor	30	(3) #10 W/G	1/2"	X						Space	50
51	"					X					"	52
53	"						X				"	54
55	Main	600	(4) #3 W/G	3/4"	X			1'-1/4"	(3) #2 W/G	150	unknown	56
57	"					X					"	58
59	"						X				"	60

NOTES
1. CIRCUIT ADDED

General Notes

MICROGRID SYSTEM
WITH GROUND MOUNT PV

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Project Name and Address

UNIVERSITY OF LOUISIANA AT LAFAYETTE-CLECO POWER
2008 HUTCHINSON AVE
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09/15/2022

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PV-9.2

General Notes

MICROGRID SYSTEM
WITH GROUND MOUNT PV

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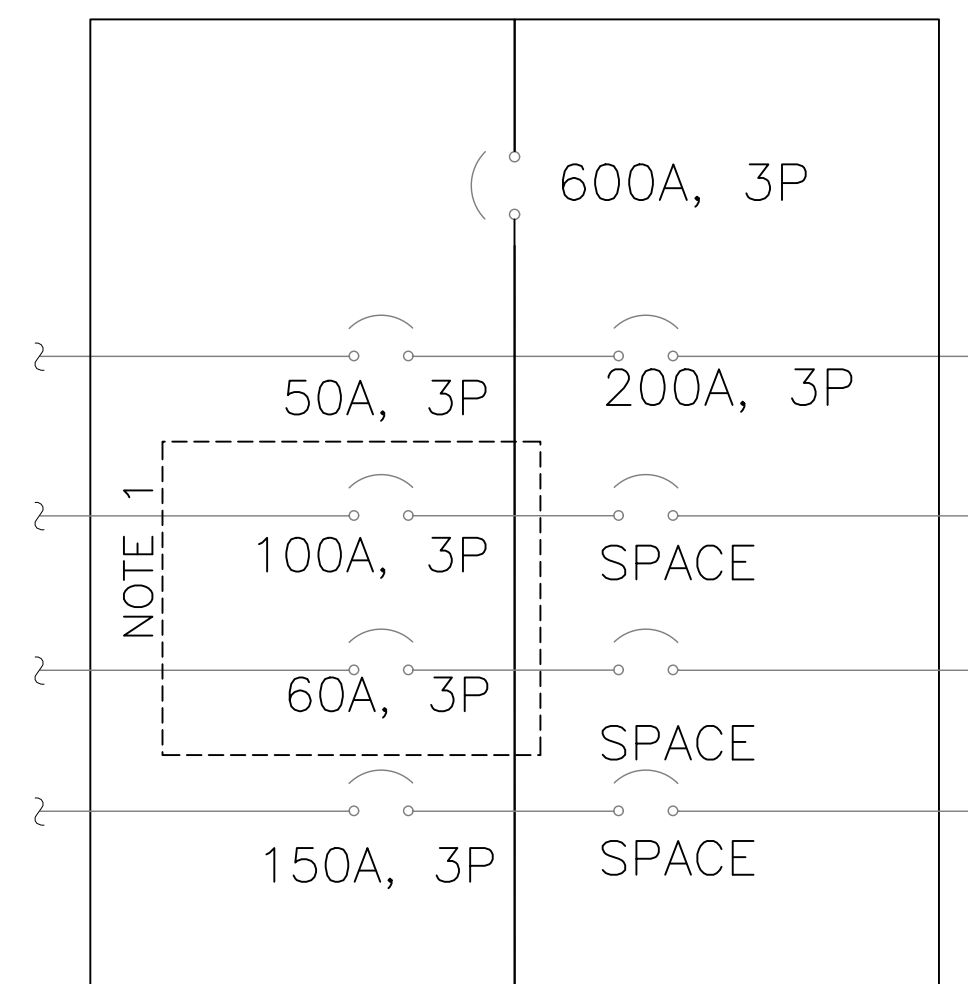
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PV-9.3

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GP-1
 NEW AC GENERATION PANEL
 480V, 3P, 4W
 600A MCB, 800A BUS



PLANNED

NOTES
 1. CIRCUITS RELOCATED FROM LP-2

New AC Generation Panel "GP-600" Schedule

Panel Voltage	480	Fed From		Secondary Transformer	[500kVA, 3P]	Manufacturer/Model	Square D / I-Line HCN14654M					
Panel Phase/Wire	3P/4W	Panel Type	MCB	Note: 600A MCB. New loads and existing loads relocated from Panel "AH".								
Amp Rating	800	Location /Mounting	Inside/Surface									
CCT No.	Load Type	OCPD	Wire	Conduit	Phase A	Phase B	Phase C	Conduit	Wire	OCPD	Load Type	CCT No.
1	AC Test Bed	50	(4) #8 W/G	3/4"	X			2"	(3) 2/0 W/G	200	DynaPower Inverter	2
3	"					X					"	4
5	"						X				"	6
7	ORC Generator	100	(4) #2 W/G	1"	X						Space	8
9	"					X					"	10
11	"						X				"	12
13	Gas Generator	60	(4) #6 W/G	1"	X						Space	14
15	"					X					"	16
17	"						X				"	18
19	AC Load Bank	150	(4) 2/0 W/G	2"	X						Space	20
21	"										"	22
23	"										"	24

Table 3: Series 6 Module Mechanical Specifications

DIMENSION	SPECIFICATION	MODEL TYPE	DETAILS
A	Length	FS-6XXX / FS-6XXXXA	2009 mm +3/-1 mm (79.1 +0.11 / -0.04 in)
		FS-6XXX-P / FS-6XXXX-P FS-6XXX-P-I / FS-6XXXX-P-I	2024 mm +3/-1 mm (79.7 +0.11/-0.04 in)
B	Width	FS-6XXX / FS-6XXXXA	1232 mm ± 2 mm (48.5 ± 0.08 in)
		FS-6XXX-P / FS-6XXXX-P FS-6XXX-P-I / FS-6XXXX-P-I	1245 mm ± 2 mm (49.0 ± 0.08 in)
C	Height	FS-6XXX / FS-6XXXXA FS-6XXX-P / FS-6XXXX-P	49 mm ± 1 mm (1.9 ± 0.04 in)
		FS-6XXX-P-I / FS-6XXXX-P-I	45.5 mm ± 1 mm (1.8 ± 0.04 in)
D	Junction Box Lead Wire ⁴	FS-6XXX / FS-6XXXXA	2.5 mm ² (14 AWG) 720 mm (28.35 in) (+) & Bulkhead (-)
		FS-6XXX-P / FS-6XXXX-P FS-6XXX-P-I / FS-6XXXX-P-I	2.5 mm ² (14 AWG) 733 mm (28.86 in) (+) & Bulkhead (-)
Total Area		FS-6XXX / FS-6XXXXA	2.47 m ² (26.5 ft ²)
		FS-6XXX-P / FS-6XXXX-P FS-6XXX-P-I / FS-6XXXX-P-I	2.52 m ² (27.1 ft ²)
Module Weight ⁵		FS-6XXX / FS-6XXXXA	34.5 ± 1 kg (76 ± 2.2 lbs)
		FS-6XXX-P / FS-6XXXX-P	34.9 ± 1 kg (76.9 ± 2.2 lbs)
		FS-6XXX-P-I / FS-6XXXX-P-I	34.2 ± 1 kg (75.4 ± 2.2 lbs)
Fire Performance ⁶		FS-6XXX / FS-6XXXX FS-6XXX-P / FS-6XXXX-P FS-6XXX-P-I / FS-6XXXX-P-I	Type 19: Class A Spread of Flame / Class C Burning Brand

6 MECHANICAL SPECIFICATIONS

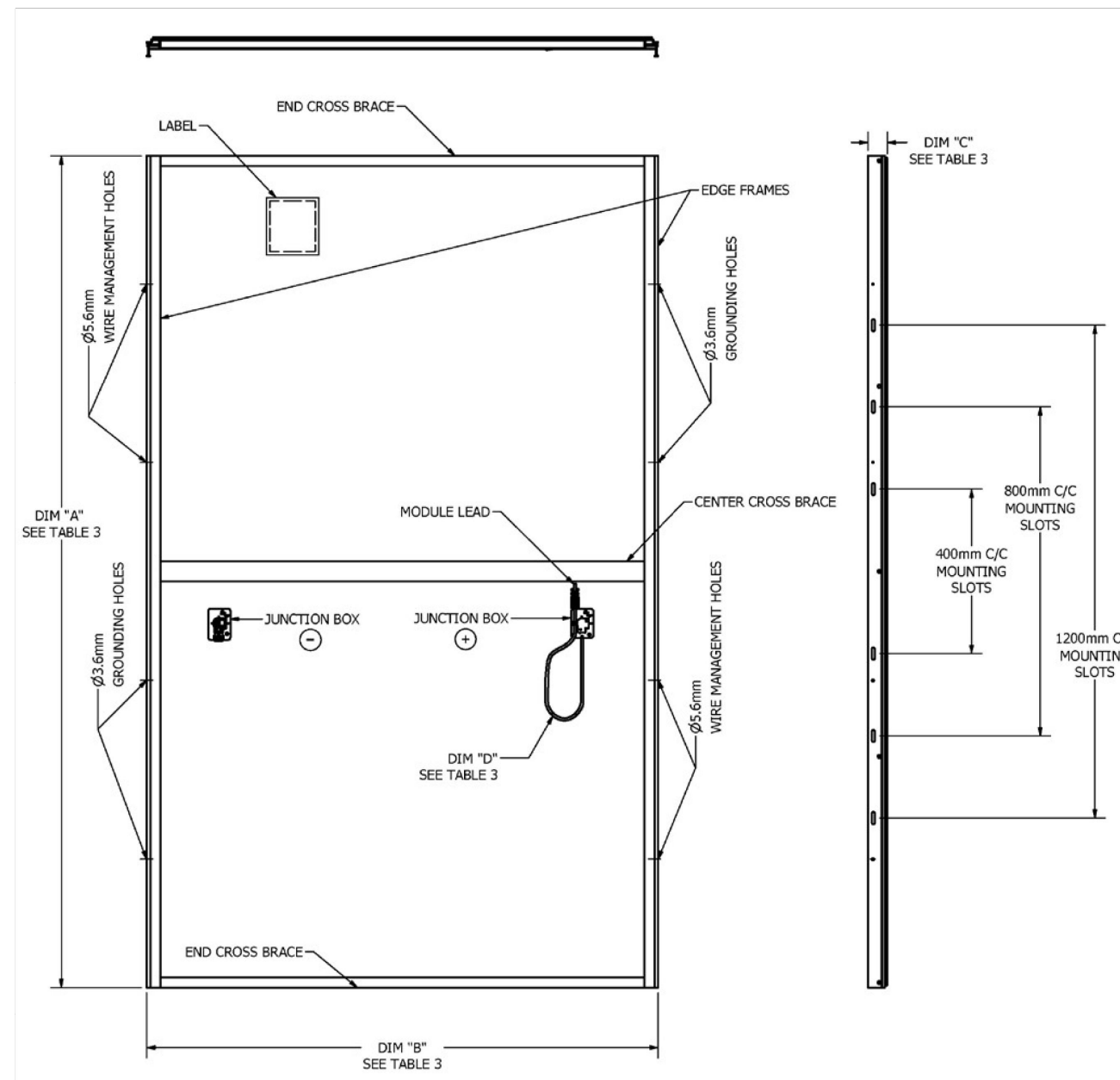


Figure 2: Series 6 Module Mechanical Drawing

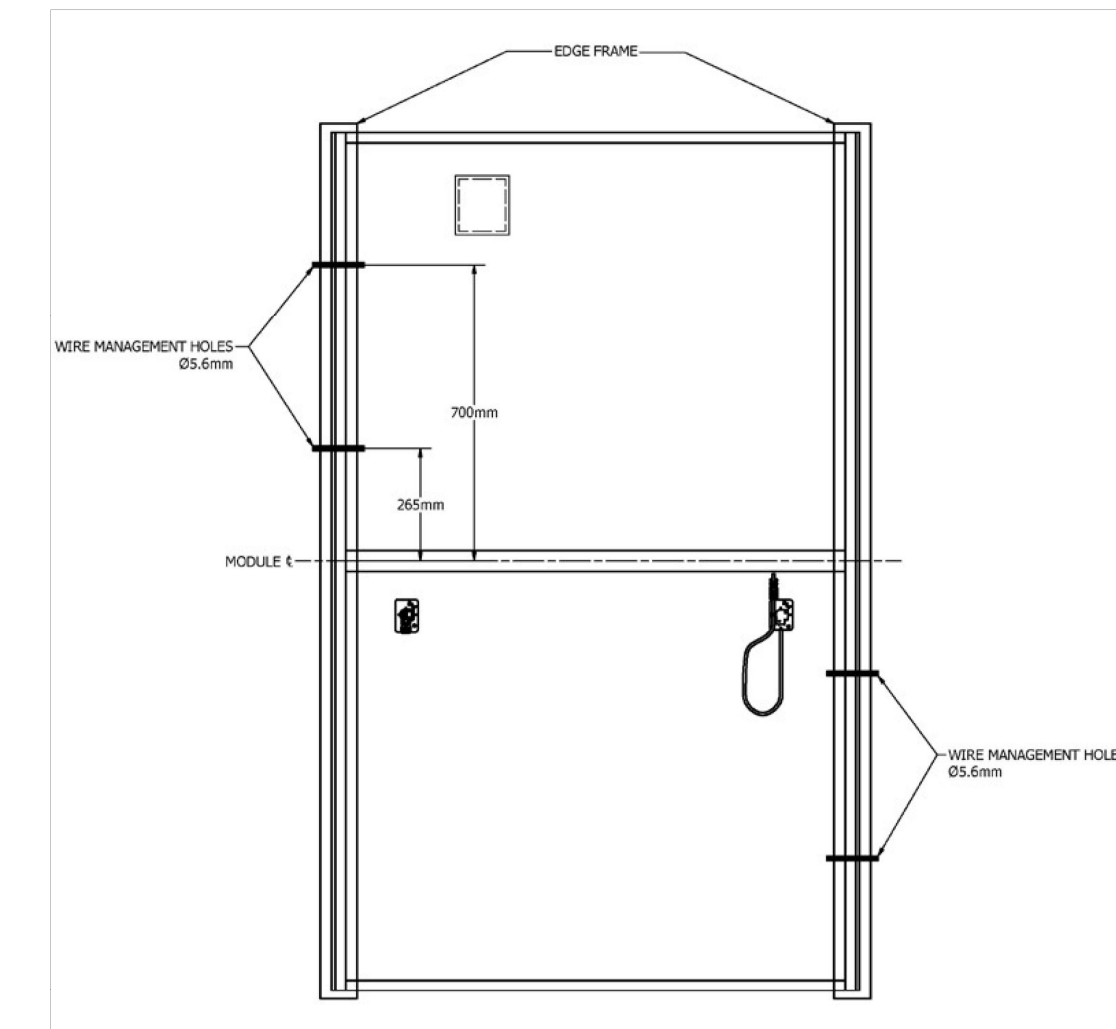


Figure 10: The above-ground DC cabling (typically a bundle of Harnesses and PV array cables) may be supported by the wire management holes located on the Series 6 Module Edge Frames.

- ▶ Holes located 265mm (10.4 in) from the center of the Edge Frame:
 - Support DC wiring bundle on Single-Torque Tube Tracker Systems
 - Support Harness end/connector (as it is being routed to the junction box)
- ▶ Holes located 700mm (27.6 in) from the center of the Edge Frame:
 - Support DC wiring bundle on Two-Girder Tracker and Fixed-Tilt Systems
 - Support DC wiring bundle on Single-Torque Tube Tracker Systems with moving components that extend beyond 350mm (13.8 in) from the center of the structure.

Typically, the lead wire connection does not require wire retention or securement due to the proximity of the junction boxes on adjacent modules.

General Notes

MICROGRID SYSTEM
WITH GROUND MOUNT PV

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OMCO SOLAR
9.5 GW of Solar Mounting and Racking Experience

OMCO Origin™
FACTORY-DIRECT TRACKERS

omco Origin™ MONOFACIAL TRACKER Technical Specifications

Tracking technology:	Single-row, horizontal, balanced, single-axis
Tracking range:	120°
Modules and configurations:	Framed silicon modules - Up to 120 Series 6 modules - Up to 96 1-in-portrait
Dimensions:	Height - Modules at 60° - 2.4 m (7.8 feet) Width - Modules horizontal - 2.0 m (6.5 feet) Length - Up to 122 m (400 feet)
Foundations:	Driven C posts Driven I or W posts
Structural materials:	Galvanized steel per ASTM A653
Drive:	1 slow drive per tracker 20 drives per MW (typical)
Motor:	1 24-volt dc brushed motor per tracker 20 motors per MW (typical)
Control system:	1 tracker control unit mounted to each tracker with internal inclinometer DC with 30- or 60-watt module and onboard battery AC up to 264 vac input 1 network controller per 150 trackers (wireless) 1 or more meteorological stations per site 1 remote access unit per site - datalogger and modem - if needed
Communication:	Network controller to tracker controllers: MODBUS over Zigbee wireless Network controller to SCADA: MODBUS TCP/IP over ethernet Cloud app available for remote monitoring and predictive maintenance
Step size:	1°
Tracking algorithm:	Based on United States Naval Observatory Solar Position Algorithm Tracking accuracy ±2°
Backtracking:	Optional - Optimized for each tracker based on topography
Night stow:	Yes
Wind stow:	Yes
Snow stow:	Yes
Snow sensor:	Optional
Bearings:	Self-lubricating acetal wear surfaces Adjustable in multiple dimensions to take up post misalignment Delivered fully assembled from the factory
North-South slope:	Up to 15%
Installation:	No welding or cutting in the field
Compliance:	UL3703, ASCE7-10
Warranty:	Structural: 10 years Control system: 5 years standard, 10 years optional Drive: 5 years Motor: 5 years Dampers: 4 years

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OMCO SOLAR

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OMCO Solar Quotation Package

Scope of Work

Solar Alternatives

Project Information: ULL Cleco

	OMCO ORIGIN Product & Quote Specifications
Structural Components	<ul style="list-style-type: none"> • Pre-galvanized drive & bearing posts • Slow drives with motors, bearing assembly, journal assembly • Torque tubes to connect module mounts, and splice connectors • Module mounts • PV Modules • Tracker control units, network control units, remote sensing units • Misc Joystick components- Kobalt 24V Charger & 24V 2.0AH Battery (to be supplied by customer) • Standard Anemometers • 1 Brushed 24 VDC motor per tracker • 4 Dampers per tracker • All necessary hardware required for assembly
Documentation & Support	<ul style="list-style-type: none"> • Installation manual • Full bill of materials • Marking labels - UL 969 • Stamped issued for Construction drawings to include: <ul style="list-style-type: none"> • Structure Calculations • Foundation Drawings • Site specific array layout drawings and part drawings • On-site support as required
Warranty	<ul style="list-style-type: none"> • 10 year warranty on OMCO racking components. • Warranty on motors, drives, bearing components, and control units as determined by Manufacturer
Logistics	<ul style="list-style-type: none"> • On site deliveries for the project will begin subject to finalized contracts • Components may ship from multiple locations • Site specific components shipping BOM provided at time of shipment
Notes, Assumptions, Clarifications and Exclusions	<ul style="list-style-type: none"> • Quote assumes design loads in accordance with information provided by the customer • Opaf ground snow load 120 mph wind speed per ASCE7-10 • Assumes 15 ft pile embedment for quotation • Excludes costs associated with remediation of pile refusals • UL 3703 compliant (UL Certification) • Topography is assumed to conform within row design capabilities • Modules are not interchangeable; redesign may be required at additional cost • Clearing of snow and/or mud is excluded • OMCO estimated layout shown in this quote is based on site boundaries and overall project size provided by customer. Locations of other site equipment, access aisles, and setbacks require layout confirmation with customer. Final pricing may vary pending layout coordination with customer specifications. • No information has been provided that identifies the site contours or topography. Pricing assumes that the site is flat. Final quote requires a CAD file with final surfaces of the grade after any grading is completed.

OTQ Rev 2

OMCO SOLAR

3

Project Name and Address

UNIVERSITY OF LOUISIANA AT
LAFAYETTE-CLECO POWER
2008 HUTCHINSON AVE
CROWLEY, LA 70526

Drawn By
Andrea Lee, Nick Boyd

Date
09/15/2022

Scale

Sheet

PV-10.1



The Avtron Model 4100 are resistive, AC load banks designed for outdoor installation when up to 150 kW of resistive load is required.

LOAD BANK RATINGS

Standard capacity ratings of:

- 50 kW • 125 kW
- 75 kW • 150 kW
- 100 kW

Standard load step resolution of 5 kW. Select from standard three phase voltage ratings of:

- 208-60Hz • 240/480-60Hz
- 240-50Hz • 480-50Hz
- 480-60Hz • 600-60Hz

Single phase 240 voltage is also available.

Please consult factory for non-standard ratings.

Blower Motor Control

The blower motor is factory wired to the main load bus. If external blower connection is required, the factory installed wiring must be removed. Refer to the load bank schematic for specific details.

An external 120V, 1 Phase, 60 Hz supply is required for control circuit operation.

An optional step-down transformer is available to provide the required control power. The transformer receives its power from the blower motor circuit described above.

Cooling System

Approximately 5,000 CFM cooling is provided by integral TEFC or TFAO motor which is direct coupled to the cooling fan blade.

The fan motor is fully protected with fuses, motor starter contractor, and overload relay.

Operator Controls

The standard load control for the 4100 is a manual 19" rack mount panel. Controls include: Power On/Off switch, Blower Start/Stop push buttons, Master Load On/Off switch, and Individual Load Step switches. Visual indicators include: Power On, Blower On, and Blower/Air Failure.

Other control options are available, please consult factory.

Construction

The 4100 is constructed using heavy gauge aluminum steel per ASTM A463. It is designed for continuous outdoor weatherproof operation. Forklift channels are provided in the base for lifting.

All exterior fasteners are stainless steel. The main input bus, load step relays, fuses, and blower/control relays are located in the main enclosure. The 4100 load bank is listed to UL standard 508A.

Finish

The 4100 has a high quality baked polyester powder coated finish with a film thickness of 2.8 +/- 0.4 mils per coat. The standard color is gray (ANSI 61).

Two Year Warranty Included

The equipment is covered by an industry exclusive 24-month parts and labor warranty.

Model 4100 Specifications

Resistor Elements

Avtron load banks use helically wound chromium alloy HeliDyne elements. Elements are fully supported across their entire length by segmented ceramic insulators on stainless steel rods. These elements are designed to operate at approximately 1/2 of their maximum continuous wire rating. Elements are positioned within the cooling airstream for optimal performance. Changes in resistance due to temperature are minimized by maintaining conservative watt densities.

The overall load tolerance of the 4100 load bank is -0, +5%. This ensures that advertised kW is delivered at rated voltage.

The elements are continuously rated at the specific voltage. Tests at lower voltages, with a corresponding reduction in overall rating, may be carried out.

Safety Features

A differential pressure switch is interlocked with the load application controls to prevent load from being supplied if cooling air is not present.

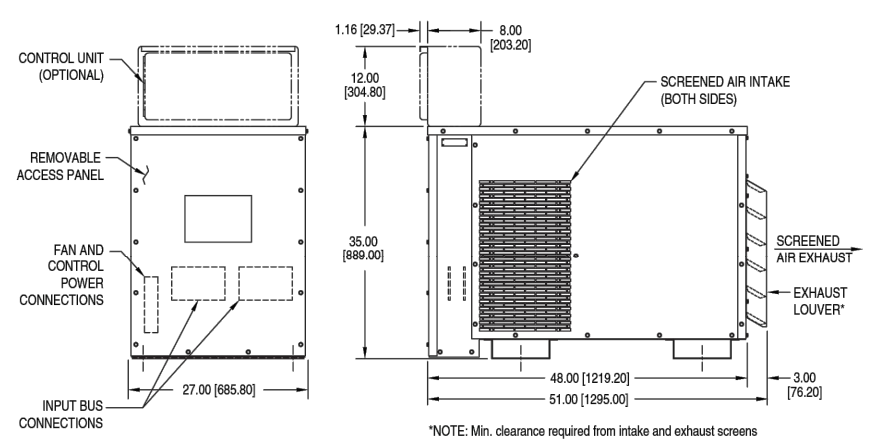
An overtemperature switch is provided to sense the load bank exhaust. The switch is interlocked with the load application controls to disable load from being supplied if an over temperature condition is present. The fan motor is protected with fuses and overloads.

Major fault protection is provided by branch circuit fuse protection. Fuse protection is provided on all load steps.

The exterior of the load bank has appropriate warning and caution statements on access panels.

Internal access is restricted by bolt on exterior panels. The air intake on the 4100 is designed to prevent objects greater than 0.50" diameter from being ingested into the unit.

Horizontal air discharge is provided and exhaust air is directed downward away from personnel.



All dimensions are in inches (millimeters). Specifications subject to change without notice.

Ambient Temperature

The 4100 load bank is designed for continuous duty cycle with no limitations. The ambient temperatures range is -20°F to 120°F (-29°C to 50°C).

Mounting

The 4100 is designed for outdoor installation on a concrete pad or structural base.

Power Terminals and Cable Entry

The power terminals are located behind a removable, bolt on access panel. The 4100 has a recommended conduit entry area underneath the power terminal assembly to facilitate load cable installation.

Optional Accessories

- Control Power Transformer
- NEMA 4 Type Control Panel Enclosure
- Automatic Load Control
- Digital Metering with Data Logging
- SIGMA 2 Digital Controls
- Remote I/O Control
- Pilot Relay Control
- PLC Control
- Arctic Rating (low temperature)

Documentation - Operating Manual

A comprehensive operator's manual is supplied electronically via a USB drive. Sections include: Safety, Installation, Operation, Maintenance, and Troubleshooting.

Testing and Standards

Avtron load banks comply with NEMA, NEC, and ANSI standards. Quality control system is certified to ISO9001 standards.

Weight and Dimensions

Dimensions (approx. mm)	Weight (approx. lbs)
Length Width Height	500/227
48/12/19	27/85/ 35/889

Avtron Power Solutions
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DPS-500 DC-DC Converter

Maximize PV generation and revenue with DC-coupled energy storage

FOR UTILITY-SCALE SOLAR PLUS STORAGE

This bi-directional 500kW DC-DC converter is designed to interface battery energy storage with new and existing 1000V and 1500V central inverter-based PV power plants.

The DPS-500 is ideal for utility-scale solar plus storage installations, offering advanced features including automated clipping recapture and low voltage harvesting that increase project revenues, while its DC-coupled architecture reduces installation and regulatory costs.

This DC-DC converter can operate in voltage, current, and power control modes, and is capable of on-the-fly switching between modes. Designed to be easily scaled, any combination of up to six units can be paralleled together to create building blocks of up to 3MW of storage power.

Key Technologies

- Clipping Recapture
- Low Voltage Harvesting
- Curtailment Recapture
- Energy Time Shifting
- Ramp Rate Control

System Advantages:

- Reduce installation and regulatory costs through DC-coupled architecture
- Scalable storage power up to 3MW with paralleled units



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1-504-267-1660

General Notes

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DPS-500 DC-DC Converter

TECHNICAL SPECIFICATIONS

Electrical

DC Input Voltage Range (Battery Port):	100-1500 _{VDC}
DC Input Voltage Range (PV Port):	100-1500 _{VDC}
Maximum Power Rating:	500kW (@1000V _{DC}) 600kW (@1200-1500V _{DC})
Maximum Current Rating:	+/-500A _{DC}
Maximum Efficiency:	99%
Average Efficiency:	98.2%
Aux/Controls Power:	Customer supplied 120V, 1-ph, 60Hz, 1KVA service Customer supplied 230V, 1-ph, 60Hz, 1KVA service

Environmental

Operating Temp:	-25 to +55°C
Cooling:	Forced Air Cooled
Enclosure:	UL 3R/IP 54
Max Elevation:	1000 Meters Full Power 3000 Meters with Derating
Dimensions (L x W x H):	33.5" x 38.4" x 80.5"
Weight:	1300 lbs
Cable Connections:	Side or bottom entry

Certifications & Standards Compliance

- UL 1741
- CSA C22.2 #107.1
- UL / IEC 62109-1
- IEC / EN 61000-6-4
- IEC / EN 61000-6-2
- CISPR 11 / EN 55011
- FCC Part 15 Class A
- IEEE Std C37.90.2

Hardware Protections

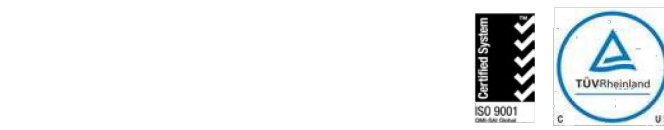
DC Contactor and Precharge on Battery Port

Software Protections

DC Over-voltage and Under-voltage
DC Over-current
Over-temperature
Fuse monitoring

User Interface

Remote Communications: Modbus TCP/IP
Local Indicators: Lamps on front panel indicating operation mode & alarm/fault status



MPS-125 Energy Storage Inverter

The world's most capable microgrid inverter

This paralleleable 125kW energy storage inverter is transformer-less, air-cooled, and compact, and optimized for behind-the-meter energy storage applications.

Featuring a highly efficient three-level topology, the MPS-125 is easily integrated into customer supplied battery storage systems or can be supplied as part of Dynapower's fully-integrated MPS+ energy storage system. Multiple MPS-125 energy storage inverters can be paralleled together to scale to meet the needs of any behind-the-meter energy storage installation.

With all the functional capabilities of the grid-scale CPS inverter family, the MPS-125 supports frequency, voltage, and VAR support applications.

With our patented Dynamic Transfer™ feature, the MPS-125 inverter monitors grid stability and will automatically disconnect and transition to stand-alone mode if a grid disturbance is detected, ensuring consistent power to critical loads.



Key Technologies

- Islanded Operation (UF Mode)
- Dynamic Transfer
- Black Start
- Frequency Compensation Mode (F-Comp)
- Volt-Var Compensation Mode (E-Comp)



MPS-125 Energy Storage Inverter

TECHNICAL SPECIFICATIONS

Electrical

AC Input Voltage:	480V _{AC} 3 Phase
Grid Frequency:	60 Hz
Rated Output Apparent Power:	125kVA
Rated Output Real Power:	125kW
Rated Output Current:	150A _{AC}
Overload AC Current:	180A _{AC}
DC Voltage Range:	740-1500V _{DC}
Max DC Current:	171A _{DC}
Power Factor:	0 - 1.00 Leading or Lagging
Current Harmonics:	IEEE 1547 Compliant, <5% TDD
Maximum Efficiency:	98.7%
CEC Efficiency:	97%

Environmental & Mechanical

Operating Temp:	-25 to +50°C, De-rated from +45 to +50°C
Cooling:	Forced Air Cooled
Enclosure:	UL 3R/IP 54
Max Elevation:	1000 Meters Full Power Up to 3000 Meters with Derating
Dimensions (H x W x D):	36" x 28" x 15.25"
Weight:	176 lbs

Certifications & Standards Compliance

UL 1741 SA	IEEE 519
IEEE 1547	CSA 22.2 #107.1
NFPA 70	

Hardware Protections

- AC Breaker with Shunt Trip
- AC Surge Protection
- DC Disconnect
- DC Input Fuses
- DC Pre-charge (Optional)



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Drawn By
Andrea Lee, Nick Boyd

Date
09/15/2022

Scale

Sheet

PV-10.2

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Revisions		
No.	Issue	Date
110822	REVIEW	
120222	REVIEW	
121222	REVIEW	
122022	REVIEW	
090823	BID SET	
092023	PAD UPDATE	

Project Name and Address

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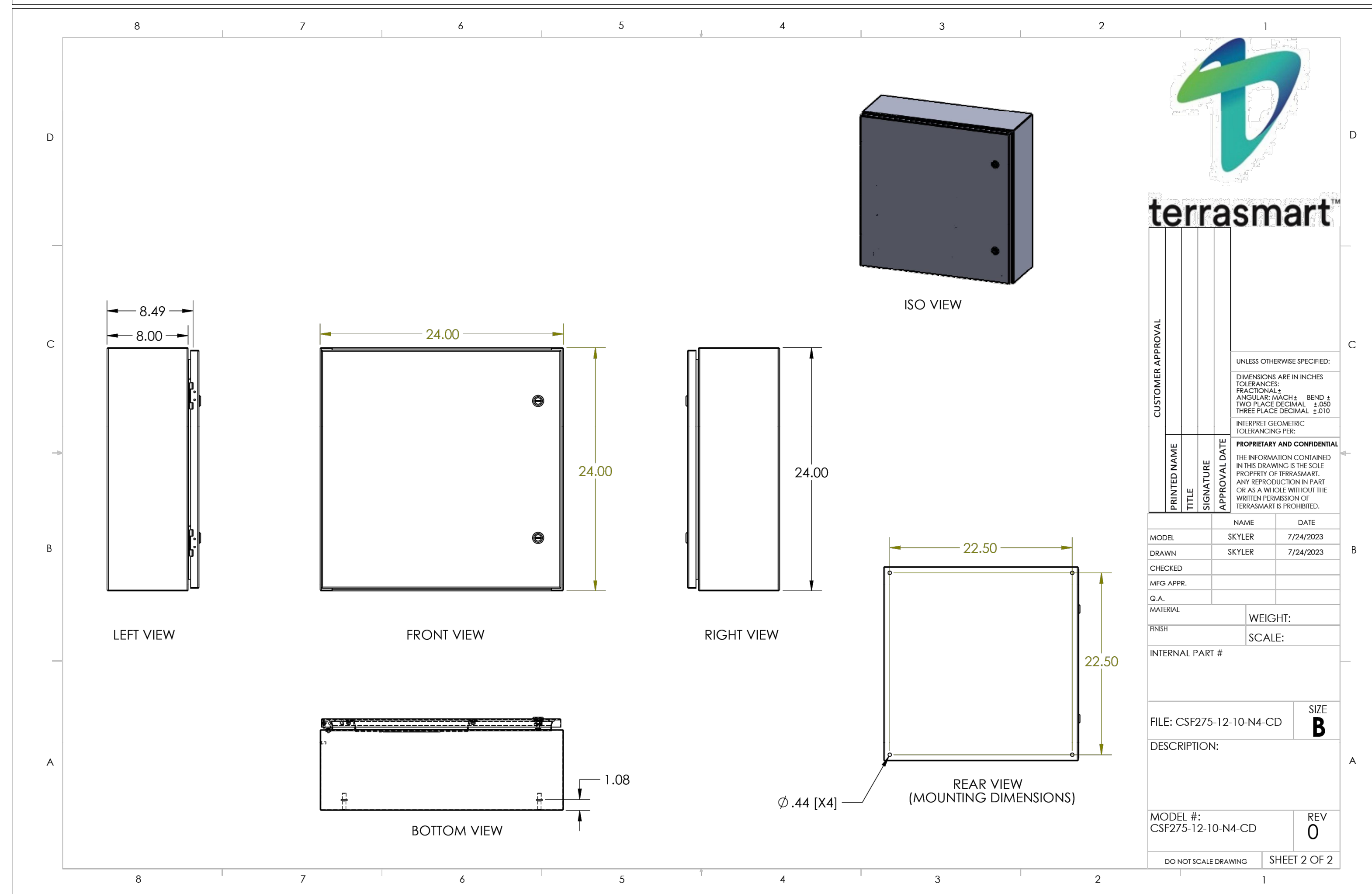
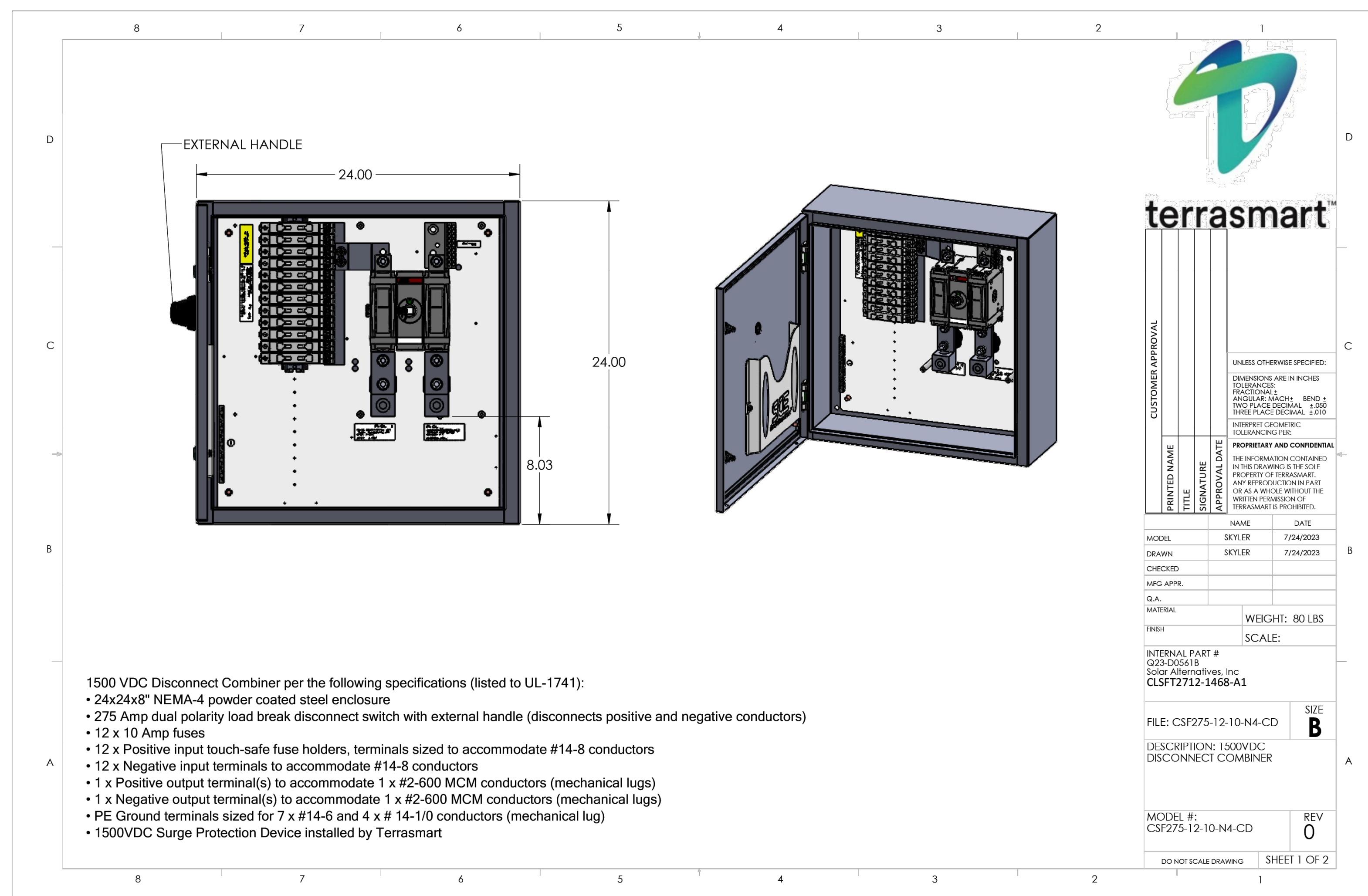
Drawn By
Andrea Lee, Nick Boyd

Date
09/15/2022

Scale
N/A

PV-10.3

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ASCO Power Technologies

ASCO SERIES 300 Power Transfer Switches Technical Data and Ordering Information

ascopower.com

Life is On Schneider Electric

ASCO SERIES 300 ORDERING INFORMATION

To order an ASCO SERIES 300 Power Transfer Switch, complete the following catalog number:

J	03ATS	A	3	0600	N	GX	C
FRAME	TRANSITION TYPE	NEUTRAL CODE	PHASE POLES	AMPERES	VOLTAGE CODE	GROUP CODE	ENCLOSURE
Open Transition D = 30A - 230A	Automatic 03ATS Open Transition	A = Solid Neutral	2	0030 ¹ 0070 ¹ 0104 ¹ 0150 ^{1,4}	A ¹ = 115 B ¹ = 120 C = 208	G0 No Optional Accessories	O = Open Type (zero) C = Type 1 Enclosure
Open/Delayed Transition J = 150A - 600A H = 800A - 1200A G = 1500A - 3000A	3ADTS Delayed Transition Non Automatic 03ATS Open Transition 3NDS Delayed Transition	B = Switched Neutral	3	0200 ^{1,3,4} 0230 ^{1,3,4} 0260 ^{1,4} 0400 ^{1,4} 0600 ¹ 0800 ¹ 1000 ¹ 1200 ^{1,5} 1600 ^{1,5} 2000 ^{1,5} 2600 ^{1,5} 3000 ^{1,5}	E = 230 F = 240 H = 380 J = 400 K = 415 L = 440 M = 460 N = 480 P = 550 Q = 575 R = 600	GX Optional Accessories	F = Type 3R ¹ Enclosure G = Type 4 ¹ Enclosure H = Type 4X ¹ Enclosure (304 Stainless Steel) L = Type 12 Enclosure M = Type 3R ¹ Secure Double-Door Enclosure N = Type 4 ¹ Secure Double-Door Enclosure Q = Type 12 Enclosure Double-Door Enclosure R = Type 3R ¹ Secure Double-Door Enclosure (304 Stainless Steel) S = Type 3R ¹ Secure Double-Door Enclosure (316 Stainless Steel) U = Type 4X ¹ Enclosure (316 Stainless Steel) V = Type 4X ¹ Secure Double-Door Enclosure (316 Stainless Steel)

- Notes:
- Switch sizes 30-600 amperes supplied in non-secure enclosures as standard.
 - 115-120 volt available for 30-400 amperes only. For other voltage contact ASCO.
 - 200 and 230 amperes rated switches for use with copper cable only.
 - Switch sizes 800-3000 amperes, and 1500-2000 amperes 3ADTS/3NDS provided in secure type outdoor enclosures when required.
 - Use Type 3R secure for 2000, 2600, and 3000.
 - Type 304 stainless steel is standard. Suitable for indoor or outdoor use where there may be caustic or alkali chemicals in use. To provide an improved reduction in corrosion of salt and some chemicals, optional type 316 stainless steel is recommended. This is the preferred choice for marine environments.
 - Available on enclosures rated 1500, 2000, 2600, and 3000 amperes.
 - When temperatures below 32°F can be expected, special precautions should be taken, such as the inclusion of strip heaters, to prevent condensation and freezing of this concentration. This is particularly important when environmental enclosures (Type 3R, 4, and 12) are installed for outdoor applications.
 - Type 3R enclosures are not suitable for installations subject to wind blown rain or snow. Use Type 4 enclosures where available or install supplemental weather protection around the 3R enclosure.

SERIES 300 EXTERNAL POWER CONNECTIONS

Size UL Listed Solderless Screw-Type Terminals

SWITCH RATING (AMPERES)	RANGES OF AL-CU WIRE SIZES (UNLESS SPECIFIED COPPER ONLY)
30-230 ¹ ATS and NTS only	One #14 to 4/0 AWG
150 ¹ , 260, 400	Two 1/0 AWG to 250 MCM or One #4 AWG to 600 MCM
600	Two 2/0 AWG to 600 MCM
800, 1000, 1200	Four 1/0 to 600 MCM
1600, 2000	Six 1/0 to 600 MCM
2600, 3000	Twelve 1/0 to 750 MCM

- Notes:
- All SERIES 300 switches are furnished with a solid neutral plate (unless switched neutral configuration is specified) and terminal lugs.
 - Use wire rated 75°C minimum for all power connections.
 - 200 and 230 amperes rated switches for use with copper cable only. Refer to paragraph 3.10.15 of the NEC for additional information.
 - 150 for DTIS only.

SERIES 300 Transfer Switch Dimensions and Shipping Weights

UL Type 1 Enclosure¹

SWITCH RATING AMPS	PHASE POLES	NEUTRAL CODE ²	DIMENSIONS, IN. (MM) ³			APPROX. SHIPPING WEIGHT LB. (KG)
			WIDTH	HEIGHT	DEPTH	
30 ¹ , 70 ¹ , 104 ¹ 150 ¹ , 200 ¹	2	A	18 (457)	31 (787)	13 (330)	69 (32)
	2	B	18 (457)	31 (787)	13 (330)	72 (33)
	3	A	18 (457)	31 (787)	13 (330)	72 (33)
230	2	A	18 (457)	48 (1219)	13 (330)	117 (53)
	2	B	18 (457)	48 (1219)	13 (330)	125 (57)
	3	A	18 (457)	48 (1219)	13 (330)	125 (57)
260, 400	2	A	24 (610)	56 (1422)	14 (356)	250 (113)
	2	B	24 (610)	56 (1422)	14 (356)	260 (118)
	3	A	24 (610)	56 (1422)	14 (356)	260 (118)
150, 200, 230 SERIES 3ADTS/3NDS only	2	A	24 (610)	56 (1422)	14 (356)	270 (123)
	2	B	24 (610)	56 (1422)	14 (356)	270 (123)
	3	A	24 (610)	56 (1422)	14 (356)	270 (123)
600	2	A	24 (610)	63 (1600)	17 (432)	300 (137)
	2	B	24 (610)	63 (1600)	17 (432)	320 (146)
	3	A	24 (610)	63 (1600)	17 (432)	320 (146)
800, 1000	2	A	34 (864)	72 (1829)	20 (508)	431 (196)
	2	B	34 (864)	72 (1829)	20 (508)	460 (209)
	3	A	34 (864)	72 (1829)	20 (508)	460 (209)
1200	2	A	38 (965)	87 (2210)	23 (584)	581 (264)
	2	B	38 (965)	87 (2210)	23 (584)	611 (277)
	3	A	38 (965)	87 (2210)	23 (584)	611 (277)
1600, 2000	3	A	38 (965)	87 (2210)	23 (584)	1160 (525)
	3	B	38 (965)	87 (2210)	23 (584)	1160 (525)
	3	A	38 (965)	91 (2311)	72 (1829)	1430 (649)
2600, 3000 ⁴	3	A	38 (965)	91 (2311)	72 (1829)	1495 (679)
	3	B	38 (965)	91 (2311)	72 (1829)	1495 (679)

- Notes:
- Neutral Codes: 0=Non, A=Solid, B=Switched
 - Dimensional data is approximate and subject to change. Certified dimensions available upon request.
 - Dimensions for 30-200 amperes models when furnished with accessory 150, power meter are 18 1/4" x 41 1/4" x 13 1/4".
 - Enclosures for 2600, 3000 amperes are free-standing with removable top, sides and back.
- ¹ Unit is designed for top cable entry of emergency and load, and bottom entry of normal. A cable pull box is also available for all top or bottom cable access when required (optional accessory kit #R60002). Not required for types 3R, 4X, and 12 enclosures where available.



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General Notes

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ABB MOTOR PROTECTION AND CONTROL 3/47

AF40 ... AF96 3-pole contactors 18.5 to 45 kW AC / DC operated



AF40 ... AF96 contactors are mainly used for controlling 3-phase motors and power circuits up to 1000 V AC and 220 V DC. These contactors are of the block type design with 3 main poles.

- control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC), only 4 control voltage ranges covering 24...500 V 50/60 Hz and 20...500 V DC
- can manage large control voltage variations
- reduced panel energy consumption
- very distinct closing and opening
- can withstand short voltage dips and voltage sags (SEMI F47-0706 conditions of use on request).
- built-in surge suppression
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

IEC Rated operational power 400V AC-3 AC-1 AC-1	UL/CSA 3-phase motor use rating 480V AC	General voltage use rating 600V AC	Rated control circuit voltage U _c min...U _c max.	Auxiliary contacts fitted	Type (1)	Order code	Weight (kg)	
15	7.5	30	24...60	0/1	0	AF40-30-00-11	158L34700K1300	0.970
22	100	40	80	48...130	0/0	AF40-30-00-12	158L34700K1200	0.970
				100...250	0/0	AF40-30-00-13	158L34700K1300	0.960
				250...500	0/0	AF40-30-00-14	158L34700K1400	0.950
30	105	50	90	48...130	0/0	AF96-30-00-12	158L38700K1200	0.970
				100...250	0/0	AF96-30-00-13	158L38700K1300	0.960
				250...500	0/0	AF96-30-00-14	158L38700K1400	0.950
37	125	60	105	48...130	0/0	AF96-30-00-11	158L39700K1300	1.220
				100...250	0/0	AF96-30-00-12	158L39700K1200	1.200
				250...500	0/0	AF96-30-00-14	158L39700K1400	1.170
45/55	130	60/75	115	24...60	0/1	AF96-30-00-11	158L40700K1300	1.220
				48...130	0/0	AF96-30-00-12	158L40700K1200	1.200
				100...250	0/0	AF96-30-00-13	158L40700K1300	1.170
				250...500	0/0	AF96-30-00-14	158L40700K1400	1.170

(1) For control by PLC output, use A4 interface relay.

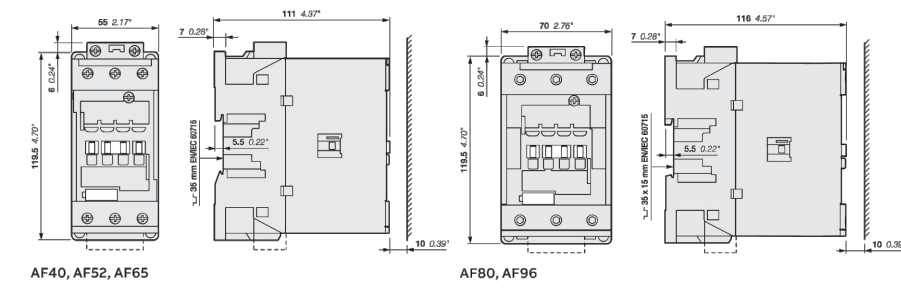
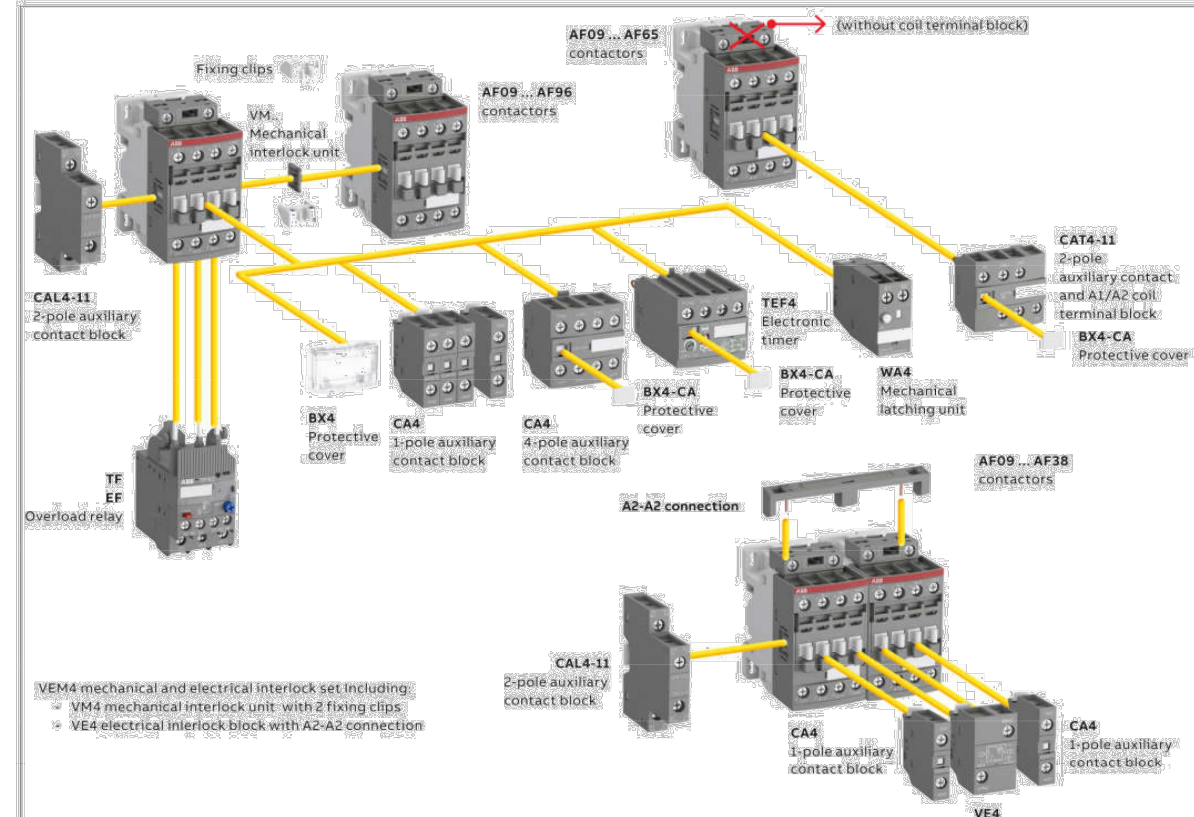


ABB MOTOR PROTECTION AND CONTROL 3/48

AF09... AF96 3-pole contactors Contactors and main accessories



Main accessory fitting details - for ordering details, technical data and other accessories: see section accessories. Many configurations of accessories are possible depending on whether these are front-mounted or side-mounted.

Control types	Main poles	Built-in auxiliary contacts	Front-mounted accessories Auxiliary contact blocks	Electronic timer	Mechanical interlocking units	Electrical and mechanical interlock set (front-mounted)	Side-mounted accessories Auxiliary contact blocks
AF09Z...AF38Z (1)	3	0	1-pole CA4	TEFA	WMA(2)	YEMA	3-pole CAL4(1)
AF40...AF96	3	0	2-pole CA4	TEFA	WMA(2)	YEMA	3-pole CAL4(1)

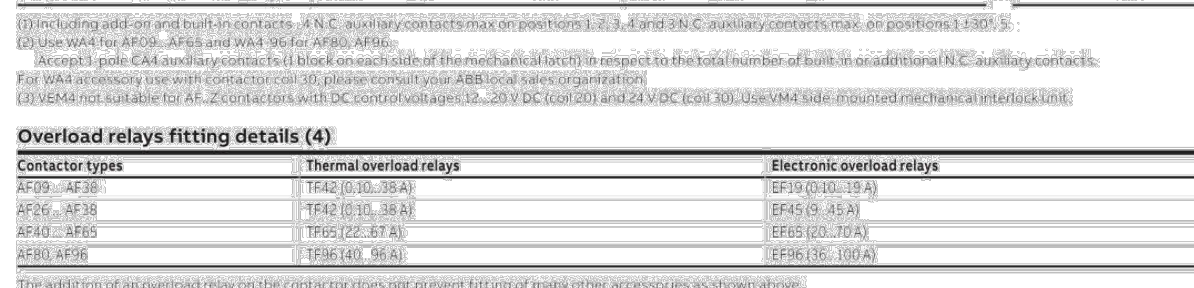


ABB MOTOR PROTECTION AND CONTROL 3/64

AF400 ... AF750 3-pole contactors 200 to 400 kW AC / DC operated with 1 N.O. + 1 N.C. auxiliary contacts



AF400 ... AF750 contactors are mainly used for controlling 3-phase motors and power circuits up to 1000 V AC or 600 V DC (2). These contactors are of the block type design with 3 main poles.

- control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC), only 4 coils to cover control voltages between 48...500 V 50/60 Hz and 24...500 V DC
- can manage large control voltage variations
- reduced panel energy consumption
- very distinct closing and opening
- can withstand short voltage dips and voltage sags (SEMI F47 conditions of use on request).
- built-in surge suppression
- add-on auxiliary contact blocks for side mounting and a wide range of accessories.

IEC Rated operational power 400V AC-3 AC-1 AC-1	UL/CSA 3-phase motor use rating 480V AC	General voltage use rating 600V AC	Rated control circuit voltage U _c min...U _c max.	Auxiliary contacts fitted	Type (1)	Order code	Weight (kg)	
200	600	300	550	0	1	AF400-30-11	158L37700R0611 (1)	12.000
250	700	400	650	48...130	1	AF400-30-11	158L37700R0611 (1)	12.000
				100...250	1	AF400-30-11	158L37700R0711 (1)	12.000
				250...500	1	AF400-30-11	158L37700R0811 (1)	12.000
315	800	500	750	48...130	1	AF400-30-11	158L39700R0611 (1)	12.000
				100...250	1	AF400-30-11	158L39700R0711 (1)	12.000
				250...500	1	AF400-30-11	158L39700R0811 (1)	12.000
400	1050	600	900	24...60	1	AF580-30-11	158L61700R0611 (1)	15.000
				48...130	1	AF580-30-11	158L61700R0711 (1)	15.000
				100...250	1	AF580-30-11	158L61700R0811 (1)	15.000
450	1200	700	1050	24...60	1	AF750-30-11	158L83700R0611 (1)	15.000
				48...130	1	AF750-30-11	158L83700R0711 (1)	15.000
				100...250	1	AF750-30-11	158L83700R0811 (1)	15.000

(1) The connection polarity indicated close to the coil terminals must be respected. Also for the positive pole and for the negative pole in 50/60 Hz for AF580, AF750.

AF400 ... AF750 are equipped with low voltage inputs for control, for example by a PLC.

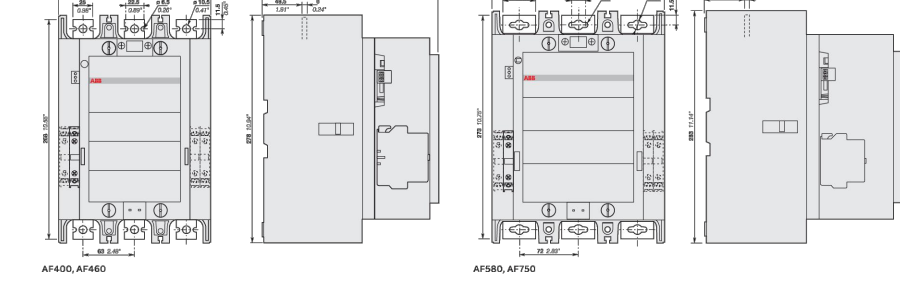
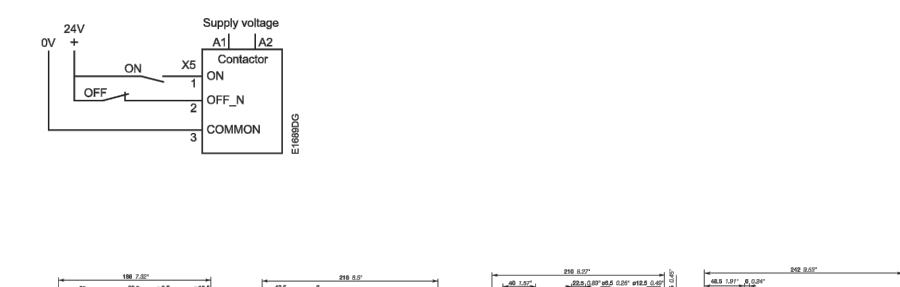
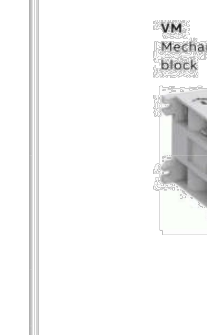
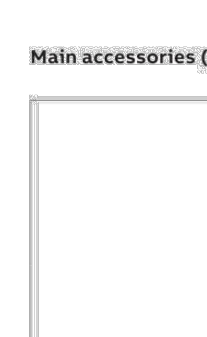


ABB MOTOR PROTECTION AND CONTROL 3/65

AF400 ... AF2850 3-pole contactors with 1 N.O. + 1 N.C. auxiliary contacts Contactors and main accessories



AF400 ... AF2850 contactors are mainly used for controlling 3-phase motors and power circuits up to 1000 V AC or 600 V DC (2). These contactors are of the block type design with 3 main poles.

- control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC), only 4 coils to cover control voltages between 48...500 V 50/60 Hz and 24...500 V DC
- can manage large control voltage variations
- reduced panel energy consumption
- very distinct closing and opening
- can withstand short voltage dips and voltage sags (SEMI F47 conditions of use on request).
- built-in surge suppression
- add-on auxiliary contact blocks for side mounting and a wide range of accessories.

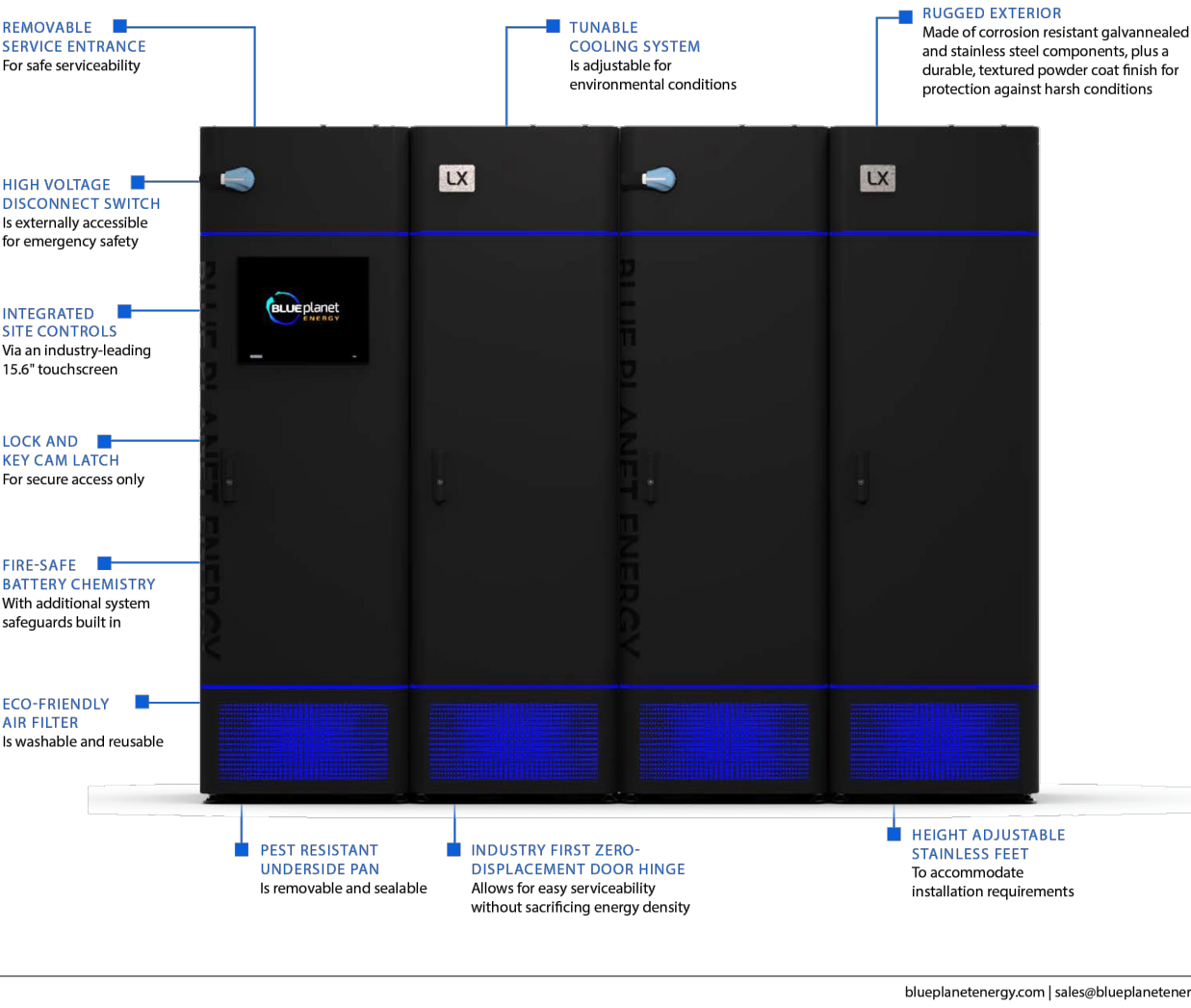
IEC Rated operational power 400V AC-3 AC-1 AC-1	UL/CSA 3-phase motor use rating 480V AC	General voltage use rating 600V AC	Rated control circuit voltage U _c min...U _c max.	Auxiliary contacts fitted	Type (1)	Order code	Weight (kg)	
200	600	300	550	0	1	AF400-30-11	158L37700R0611 (1)	12.000
250	700	400	650	48...130	1	AF400-30-11	158L37700R0611 (1)	12.000
				100...250	1	AF400-30-11	158L37700R0711 (1)	12.000
				250...500	1	AF400-30-11	158L37700R0811 (1)	12.000
315	800	500	750	48...130	1	AF400-30-11	158L39700R0611 (1)	12.000
				100...250	1	AF400-30-11	158L39700R0711 (1)	12.000
				250...500	1	AF400-30-11	158L39700R0811 (1)	12.000
400	1050	600	900	24...60	1	AF580-30-11	158L61700R0611 (1)	15.000
				48...130	1	AF580-30-11	158L61700R0711 (1)	15.000
				100...250	1	AF580-30-11	158L61700R0811 (1)	15.000
450	1200	700	1050	24...60	1	AF750-30-11	158L83700R0611 (1)	15.000
				48...130	1	AF750-30-11	158L83700R0711 (1)	15.000
				100...250	1	AF750-30-11	158L83700R0811 (1)	15.000



Blue Ion LX Grid Optional™ Energy Solution

Energy from renewables like solar is variable, leaving people still tethered to the utility grid with limited options to disconnect. Blue Planet Energy takes energy to make clean power work on demand and brings new options to leave the grid behind. Our Blue Ion LX is a premium Grid Optional™ energy solution that integrates the energy storage, system intelligence and site controls needed to be grid-free. Blue Ion LX is flexible and can also work in conjunction with the grid or generators in order to optimize using them, providing you the widest range of energy options. Built in the USA, the Blue Ion LX is ruggedized for use cases where energy is absolutely critical (emergency services/healthcare) or prohibitively high-cost (business continuity/utility rate structure).

- Grid Optional™ Functions with or without the Utility Grid
- Fully Scalable and Expandable
- Operating Temperature Range: -4°F to 113°F (-20°C to 45°C)
- 100% Usable Capacity
- 21 Year Life Expectancy



Model Number

Blue Ion LX Grid Optional™ Energy Solution

System Technical Specifications

MIN SYSTEM SIZE	120kWh
EXPANDABLE	320kWh increments
COMPOSITE PHASING	26 to 24 to 22 to 19.6kVA @ 480V @ 1.0 PF
DISCONNECT (BY STATE)	19.6kVA @ 480V @ 1.0 PF
COMPOSITE TOTAL DISCONNECT	76 to 96 to 120 to 140.4kVA @ 480V @ 1.0 PF
DISCONNECT (BY STATE)	19.6kVA @ 480V @ 1.0 PF
INVERTING	Adjustable/Not Invert
ALTIITUDE LIMITATIONS	14,000 ft. (4,268 m) at Full Power

Battery Specifications

STORAGE TEMPERATURE RANGE	-4°F to 113°F (-20°C to 45°C)
DISCHARGE TEMPERATURE RANGE	-4°F to 127°F (-20°C to 50°C)
CHARGE TEMPERATURE RANGE	32°F to 113°F (0°C to 45°C)
OPERATING AMBIENT HUMIDITY	10% to 90% RH
INCLUSIVE TYPE	Hybrid/MSA 1.1
PERFORMANCE WARRANTY	15 Year @ 80% Cycle to 70% Remaining Capacity (150K SdC)
COOLING NOISE dB	65dB
EMT	1C*
CHEMISTRY	Lithium Ferrous Phosphate (LFP)
WEIGHT	1,360 to 200 kg See 220kWh increment

Controller Specifications

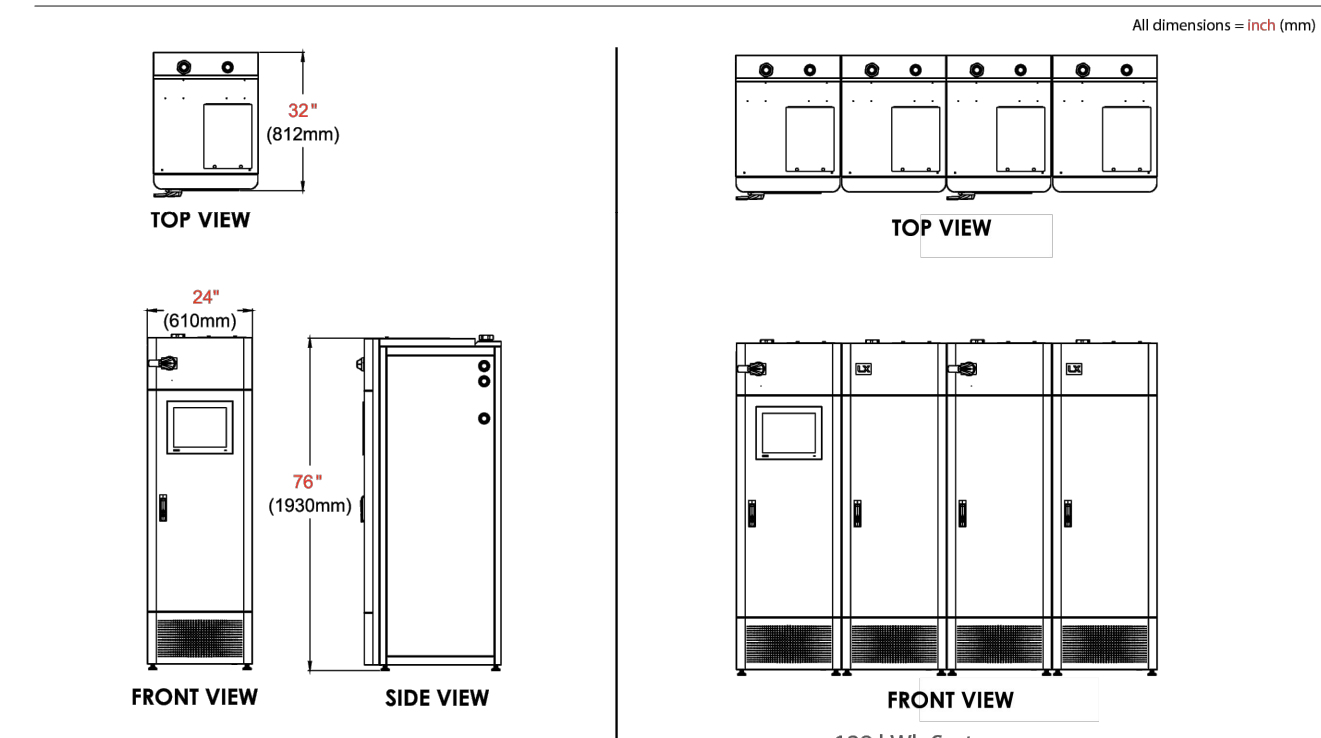
DATA ACCESS: Cloud, Local Area Network and/or Remote via LTE

Compliance Information

CERTIFIED TO	UL 948, UL 968A, UL 1741, UL 1741, UL 1741, IEEE 1547, IEEE 1547-REV2, IEEE 1547-REV3
EMISIONS	FCC Part 15 Class A, IEC 489 Class B
VENTILATION	As required by your local AHJ
FIRE SUPPRESSION	None (See UL 968A)

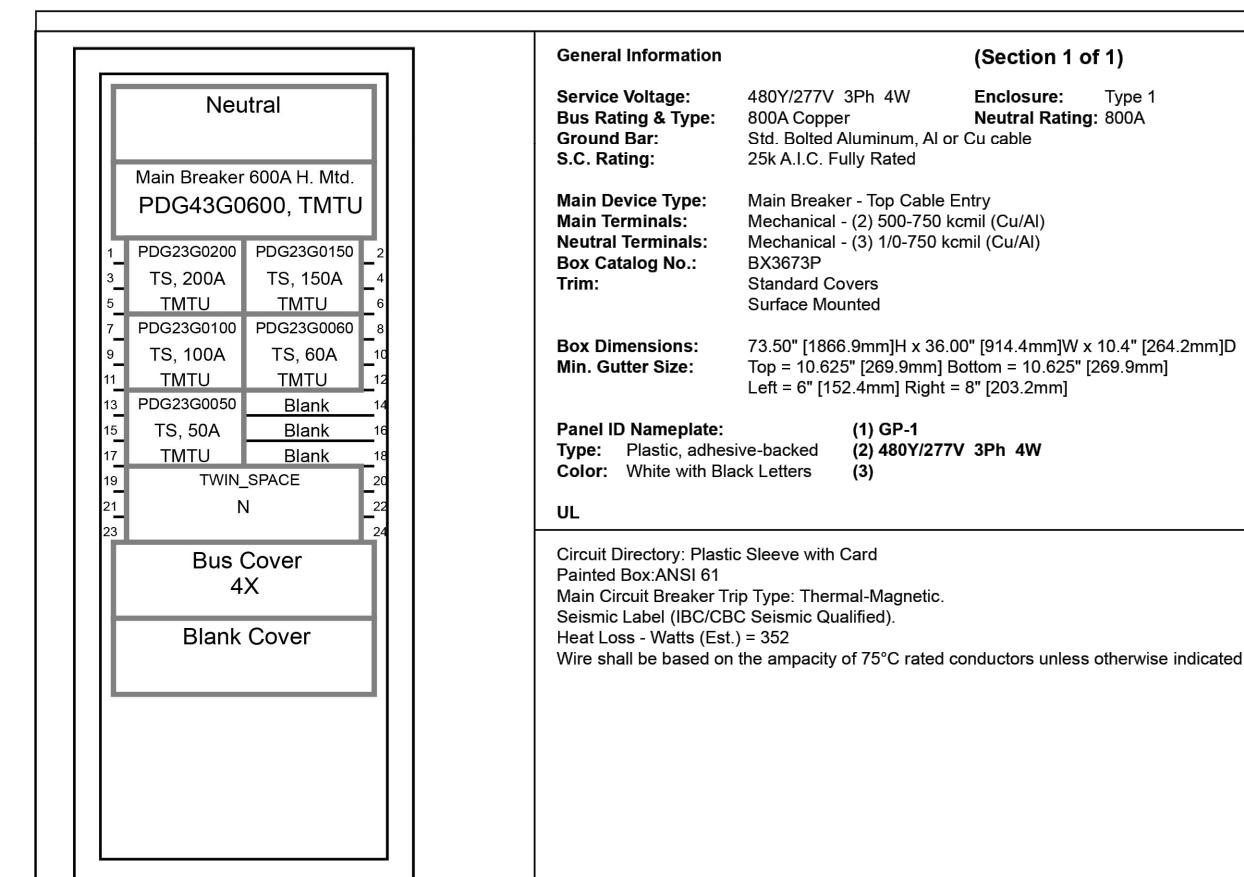
Applications

- OFF GRID: Generation source, generator interface, load control, monitoring, capacity, redundancy
- GRID INTERCONNECTED: Microgrid with full grid interconnectivity and full grid capability, self support, self consumption, self optimization, demand management, load shedding



Blue Planet Energy
50 Merchant St., 7th floor
Riverside, CA 92501

1.866.957.2246
sales@blueplanetenergy.com
blueplanetenergy.com



Device Modifications:	Description
1	3 200 Frame 2 225 25
1	3 150 Frame 2 225 25
1	3 100 Frame 2 100 25
1	3 60 Frame 2 100 25
1	3 50 Frame 2 100 25
1	3 TWIN_SPACE

Branch Devices	Qty	Poles	Trip	Frame	Amps	kAIC
1	3	200	Frame 2	225	25	25
1	3	150	Frame 2	225	25	25
1	3	100	Frame 2	100	25	25
1	3	60	Frame 2	100	25	25
1	3	50	Frame 2	100	25	25
1	3	TWIN_SPACE				

Qty	Nameplate	Device	Trip	Terminal	Modifications
Man		P023020000	600	(2) 500-750 kcmil (Cu/Al)	
1,3,5		P023020000	200	(1) #4-40 (Cu/Al)	
2,4,6		P023020100	150	(1) #4-40 (Cu/Al)	
7,8,11		P023020100	100	(1) #14-10 (Cu/Al)	
8,10,12		P023020050	60	(1) #14-10 (Cu/Al)	
13,15,17		P023020050	50	(1) #14-10 (Cu/Al)	
19,20,21,22,23,24		TWIN_SPACE	50	None Available	

Rev	DATE	DESCRIPTION	BY	CHKD	APP'D
0	2/23/2023	ISSUE FOR CONSTRUCTION	LACEY FERRARO		
1	10/05/23	REVISED FOR CONSTRUCTION	LACEY FERRARO		



5804 River Oaks Rd S
Elmwood, LA 70123
1-504-267-1660

General Notes

- MICROGRID SYSTEM WITH GROUND MOUNT PV
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- PV-3.0 SOLAR PLAN
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- PV-3.2 SOLAR COMPONENTS
- PV-3.3 SOLAR COMPONENTS
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- PV-5.0 EQUIPMENT PLAN
- PV-5.1 PAD LAYOUT
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- PV-5.4 EQUIPMENT ROOM ELEVATION
- PV-5.5 EQUIPMENT ROOM ELEVATION
- PV-5.6 EQUIPMENT ROOM ELEVATION
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- PV-8.0 COMMUNICATIONS DIAGRAM
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- PV-10.0 EQUIPMENT DATA SHEETS

Dry-Type Transformers General Information

- Standard Transformer Catalog Number: V48M47T2216
- Transformer Type: General Purpose Vented
- Phase: 3
- kVA: 225
- Primary Volts: 480
- Secondary Volts: 480Y/277
- Temperature Rise: 150C with 220C Insulation System
- Winding Material: Aluminum
- Enclosure Type: NEMA 2 (for N3R, select Weather Shield in Mods tab)
- Frequency (Hz): 60
- Frame: 944
- Wiring Diagram: 280B
- Weight (lbs.): 1912
- Impedance (%): 5.34
- UL Listed: Y
- X/R: 3.68

Standard Values

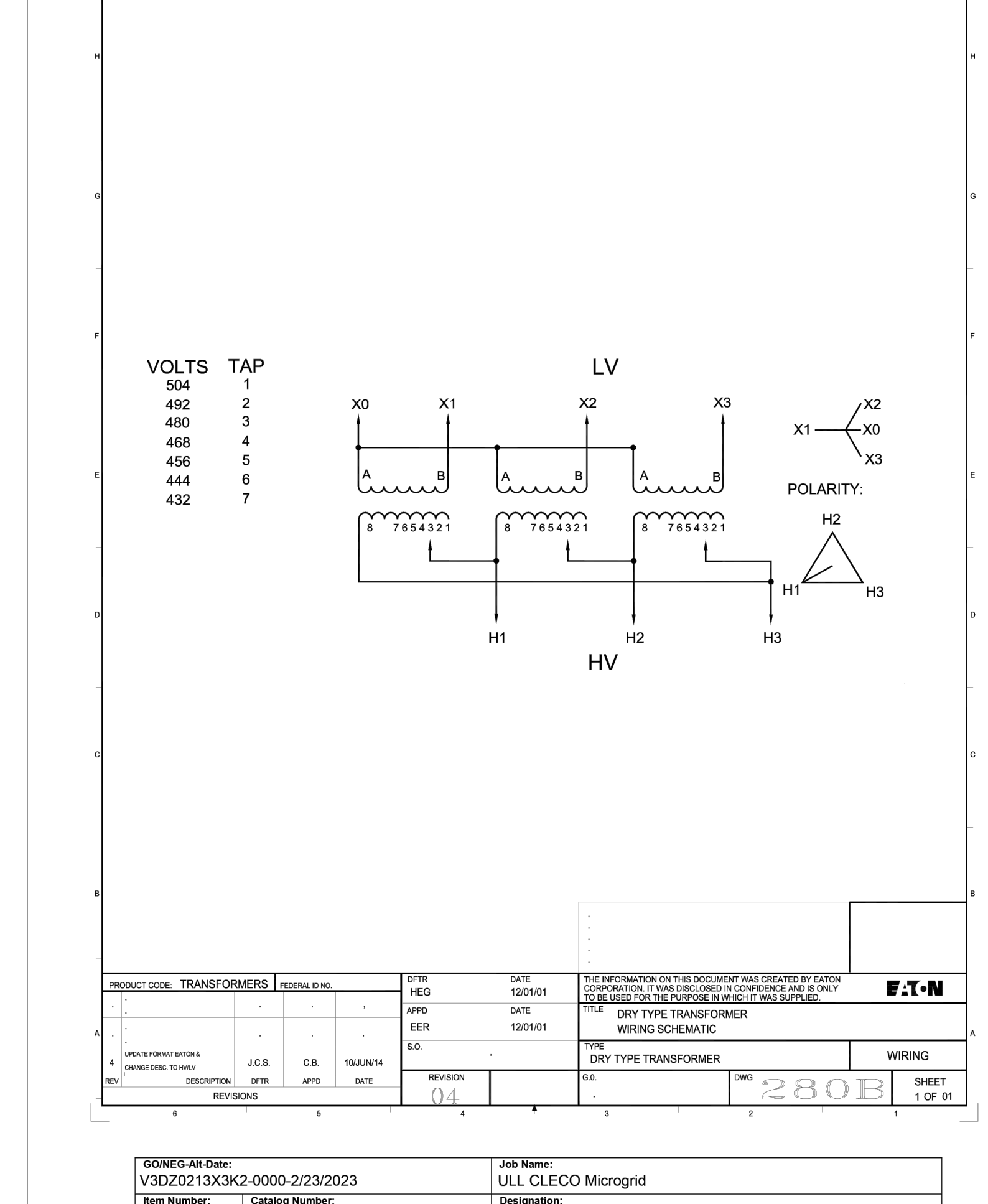
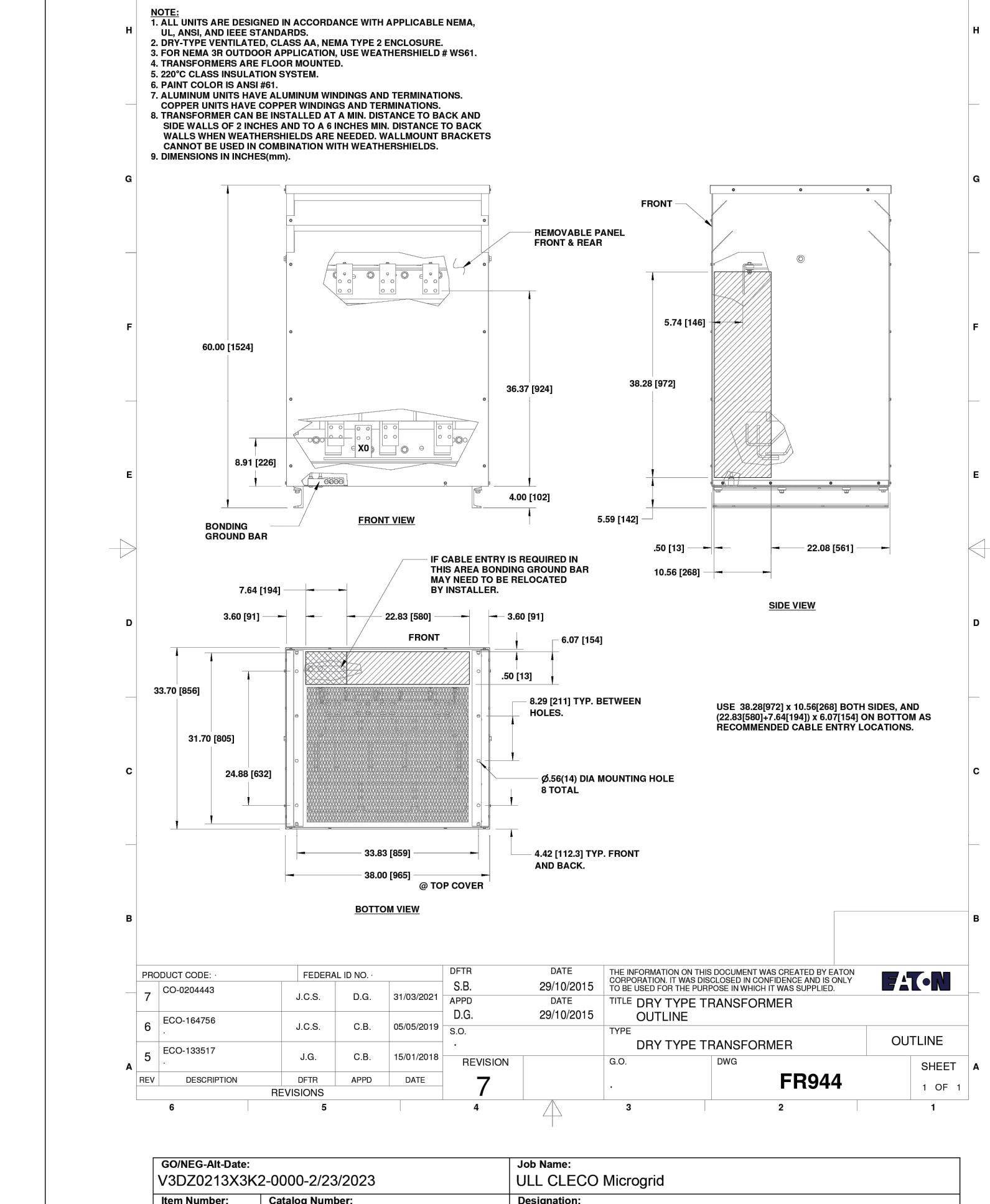
- K-Factor: 1
- TAPS: 2@+2.5%, 4@-2.5%
- Sound Reduction (dB): 0
- NEMA ST20 Sound Level (dB): 55
- DOE 10 CFR Part 431 (2016) Efficient: Y
- Infrared Viewing Window: None

Field-Installed Accessories Included

- Lug Kit: LKS3 (1PH 100-167kVA or 3PH 150-300K)
- Weather Shield: WS61

PRODUCT CODE	FEDERAL ID NO.	DATE	DATE	DATE	DATE	
7 CO-024443	J.C.S. D.D.	31/03/2021	S.S.	29/10/2015	APPRO	29/10/2015
6 ECO-184756	J.C.S. C.B.	05/05/2019	S.O.			
5 ECO-138517	J.G. C.B.	15/01/2016	REVISION			

PREPARED BY	DATE	DATE	DATE	DATE	DATE
LACEY FERRARO	2/23/2023	Eaton			
APPROVED BY	DATE	JOB NAME	DESIGNATION	ULL CLECO Microgrid	
	1.0.0.4	TYPE	DRAWING TYPE	Customer Appr.	
REVISION	0	DRG SIZE	G.O.	ITEM	SHEET
		A			1 of 1



Revisions		
No.	Issue	Date
110822	REVIEW	
120222	REVIEW	
121222	REVIEW	
122022	REVIEW	
090823	BID SET	
092023	PAD UPDATE	

Project Name and Address
UNIVERSITY OF LOUISIANA AT LAFAYETTE-CLECO POWER
2008 HUTCHINSON AVE
CROWLEY, LA 70526

Drawn By: Andrea Lee, Nick Boyd
Date: 09/15/2022
Scale: N/A

PV-10.5

ETAP ICE Gateway (GW) Specification

ETAP ICE Gateway is designed to collect data from multiple devices and protocols and convert them to a single output protocol. It is available with multiple communication options including embedded Ethernet switches and built-in 4G/3G/GPRS modem. Direct I/O capability can be added using RTUe devices.

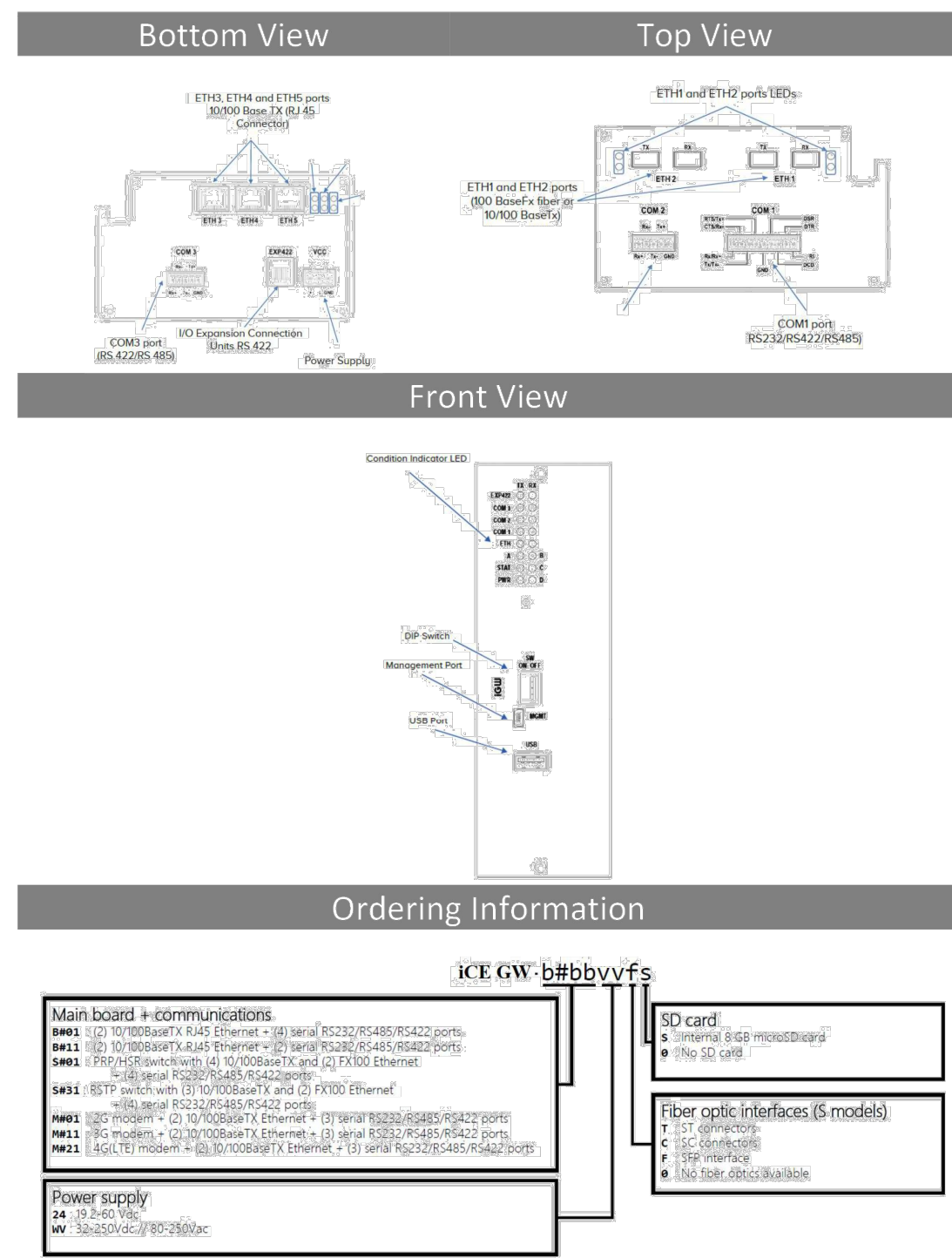
- Applications:
- Data Concentrator (Gateway)
 - Bay Control Unit (BCU)

- Features:
- IEC 62351 Cyber security compliance
 - IEC61850-3 IEC compliant
 - IEC61131-3 PLC automation programming
 - IEEE1588 and NTP time synchronization
 - Microseconds timestamp resolution and high accuracy RTC with 1.5µm time drift
 - Two separate Ethernet interfaces with independent MAC address and multiple IP address configuration
 - Internal switch with HSR/PRP/RSTP redundancy
 - Multiple communication media support (Serial, 10/100TX, Ethernet, FX100 Ethernet, GPRS, 3G & 4G modems)
 - Support for VLAN and VPN connections



General	Configuration & Maintenance
Configuration & Maintenance Case configuration with ConfigTool internet web server, allowing the real time monitoring of the system and all internal parameters. Operational controls with complete information of asset exchange on all available protocols. Local or remote maintenance connection using USB or Ethernet ports. High accuracy real time clock with 1.5µm drift and microsecond resolution on timekeeping.	RTC High accuracy real time clock with 1.5µm drift and microsecond resolution on timekeeping.
CPU features ARM Cortex A7 @ 200MHz with 4MB flash and 256MB RAM.	Security IEC 62351-3 and IEC 62351-5 support, including TLS/SSL, SSH and VPN connections.
Communication ports options Serial ports: 1 to 8 ports with RS232C/RS485/RS422 connectivity (optional). Wireless connection: internal 4G/LTE, 3G and GPRS modems. Ethernet: 10/100/1000Base-T with independent MAC addresses. Internal Ethernet Switch: 10/100/1000Base-T ports with 4-8 Ethernet ports and 10/100/1000Base-T ports with 10/100/1000Base-T ports with 4-8 Ethernet ports.	Redundancy IEC 62351-3 and IEC 62351-5 support, including an optional redundant power supply.
Time synchronization IEEE1588 and NTP.	IEC61131-3 Automation Logic and PLC programming with IEC61131-3 and IEC61131-5.
Logical and mathematical expressions Ladder language for creating simple and complex logic and mathematical expressions.	Power consumption Depending on the device.
Power supply W: wide range, 32 - 250Vdc / 80 - 250Vac (2.5kVrms isolation) 24: 19.5-60Vdc (2.5kVrms isolation)	EMC type test IEC 60950-1, IEC 60950-2, IEC 60950-3, IEC 60950-4, IEC 60950-5, IEC 60950-6, IEC 60950-7, IEC 60950-8, IEC 60950-9, IEC 60950-10, IEC 60950-11, IEC 60950-12, IEC 60950-13, IEC 60950-14, IEC 60950-15, IEC 60950-16, IEC 60950-17, IEC 60950-18, IEC 60950-19, IEC 60950-20, IEC 60950-21, IEC 60950-22, IEC 60950-23, IEC 60950-24, IEC 60950-25, IEC 60950-26, IEC 60950-27, IEC 60950-28, IEC 60950-29, IEC 60950-30, IEC 60950-31, IEC 60950-32, IEC 60950-33, IEC 60950-34, IEC 60950-35, IEC 60950-36, IEC 60950-37, IEC 60950-38, IEC 60950-39, IEC 60950-40, IEC 60950-41, IEC 60950-42, IEC 60950-43, IEC 60950-44, IEC 60950-45, IEC 60950-46, IEC 60950-47, IEC 60950-48, IEC 60950-49, IEC 60950-50, IEC 60950-51, IEC 60950-52, IEC 60950-53, IEC 60950-54, IEC 60950-55, IEC 60950-56, IEC 60950-57, IEC 60950-58, IEC 60950-59, IEC 60950-60, IEC 60950-61, IEC 60950-62, IEC 60950-63, IEC 60950-64, IEC 60950-65, IEC 60950-66, IEC 60950-67, IEC 60950-68, IEC 60950-69, IEC 60950-70, IEC 60950-71, IEC 60950-72, IEC 60950-73, IEC 60950-74, IEC 60950-75, IEC 60950-76, IEC 60950-77, IEC 60950-78, IEC 60950-79, IEC 60950-80, IEC 60950-81, IEC 60950-82, IEC 60950-83, IEC 60950-84, IEC 60950-85, IEC 60950-86, IEC 60950-87, IEC 60950-88, IEC 60950-89, IEC 60950-90, IEC 60950-91, IEC 60950-92, IEC 60950-93, IEC 60950-94, IEC 60950-95, IEC 60950-96, IEC 60950-97, IEC 60950-98, IEC 60950-99, IEC 60950-100.
Environmental Operating temperature: -25°C to +70°C IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-3, IEC 60068-2-4, IEC 60068-2-5, IEC 60068-2-6, IEC 60068-2-7, IEC 60068-2-8, IEC 60068-2-9, IEC 60068-2-10, IEC 60068-2-11, IEC 60068-2-12, IEC 60068-2-13, IEC 60068-2-14, IEC 60068-2-15, IEC 60068-2-16, IEC 60068-2-17, IEC 60068-2-18, IEC 60068-2-19, IEC 60068-2-20, IEC 60068-2-21, IEC 60068-2-22, IEC 60068-2-23, IEC 60068-2-24, IEC 60068-2-25, IEC 60068-2-26, IEC 60068-2-27, IEC 60068-2-28, IEC 60068-2-29, IEC 60068-2-30, IEC 60068-2-31, IEC 60068-2-32, IEC 60068-2-33, IEC 60068-2-34, IEC 60068-2-35, IEC 60068-2-36, IEC 60068-2-37, IEC 60068-2-38, IEC 60068-2-39, IEC 60068-2-40, IEC 60068-2-41, IEC 60068-2-42, IEC 60068-2-43, IEC 60068-2-44, IEC 60068-2-45, IEC 60068-2-46, IEC 60068-2-47, IEC 60068-2-48, IEC 60068-2-49, IEC 60068-2-50, IEC 60068-2-51, IEC 60068-2-52, IEC 60068-2-53, IEC 60068-2-54, IEC 60068-2-55, IEC 60068-2-56, IEC 60068-2-57, IEC 60068-2-58, IEC 60068-2-59, IEC 60068-2-60, IEC 60068-2-61, IEC 60068-2-62, IEC 60068-2-63, IEC 60068-2-64, IEC 60068-2-65, IEC 60068-2-66, IEC 60068-2-67, IEC 60068-2-68, IEC 60068-2-69, IEC 60068-2-70, IEC 60068-2-71, IEC 60068-2-72, IEC 60068-2-73, IEC 60068-2-74, IEC 60068-2-75, IEC 60068-2-76, IEC 60068-2-77, IEC 60068-2-78, IEC 60068-2-79, IEC 60068-2-80, IEC 60068-2-81, IEC 60068-2-82, IEC 60068-2-83, IEC 60068-2-84, IEC 60068-2-85, IEC 60068-2-86, IEC 60068-2-87, IEC 60068-2-88, IEC 60068-2-89, IEC 60068-2-90, IEC 60068-2-91, IEC 60068-2-92, IEC 60068-2-93, IEC 60068-2-94, IEC 60068-2-95, IEC 60068-2-96, IEC 60068-2-97, IEC 60068-2-98, IEC 60068-2-99, IEC 60068-3-0.	Vibration & Shock test IEC 60068-2-6, IEC 60068-2-7.
Physical External dimensions: 173 x 137 x 78.4 (mm) DIN rail mounting.	Power consumption Less than 3W.

ETAP ICE Gateway (GW) Specification



SMART POWER INTELLIGENT & INVENTIVE ENGINEERING

Microgrid Communication Signals

The following table shows the list of the monitored and controlled devices and the communication signals for each asset required for typical operation of microgrid controller. Alarms and additional signals will be also collected from each asset for monitoring and operation purpose but it is not required as part of the main operation of microgrid controller.

Asset	Controlled	Monitored	Monitored Signals	Controlled Signals
Diesel Generator	X	X	V_mag	P_ref
			V_ang	Q_ref
			P or L_mag	Start/Stop
			Q or L_ang	
			Online Status	
			Isoc/Droop	Isoc/Droop
			Fuel Level	
BESS	X	X	V_mag	P_ref
			V_ang	Q_ref
			P or L_mag	
			Q or L_ang	
			SOC	
			OprMode (Grid Following/Forming)	OprMode Ref (Grid Following/Forming)
			Online Status	
PV	X	X	V_mag	P_ref
			V_ang	Q_ref

SMART POWER INTELLIGENT & INVENTIVE ENGINEERING

Asset	Controlled	Monitored	Monitored Signals	Controlled Signals
Load	X	X	V_mag	P_ref if controllable or shed-able
			V_ang	Q_ref if controllable or shed-able
			P or L_mag	
			Q or L_ang	
			Online Status	
PCC	X	X	V_mag	
			V_ang	
			P or L_mag	
			Q or L_ang	
			Online Status	
Circuit Breaker	X	X	Status	Close/Open

SOLAR ALTERNATIVES

5804 River Oaks Rd S
Elmwood, LA 70123
1-504-267-1660

General Notes

MICROGRID SYSTEM WITH GROUND MOUNT PV

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- PV-3.3 SOLAR COMPONENTS
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- PV-5.1 PAD LAYOUT
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- PV-5.4 EQUIPMENT ROOM ELEVATION
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etap ICE RTUe Remote Terminal Unit Expansion



RTUe is an auxiliary unit for data collection or SCADA servers that allow expansion of acquisition and command capabilities to fit the requirements for many applications or facilities. Each I/O board is equipped with a RS-422 serial expansion port or a dual Ethernet ST/SC connector to communicate with data collection servers, SCADA servers, and other I/O modules. Both use Modbus with events stack and timestamps or IEC 61850 GOOSE messaging.

Features

- ice RTUe-D1D1: 48 Digital Inputs
- ice RTUe-D1R1: 24 Digital Inputs + 8 Relay Outputs
- ice RTUe-D1A1: 24 Digital Inputs + 8 Analog Inputs (0-20mA)
- I/O Expansion

I/O Expandability

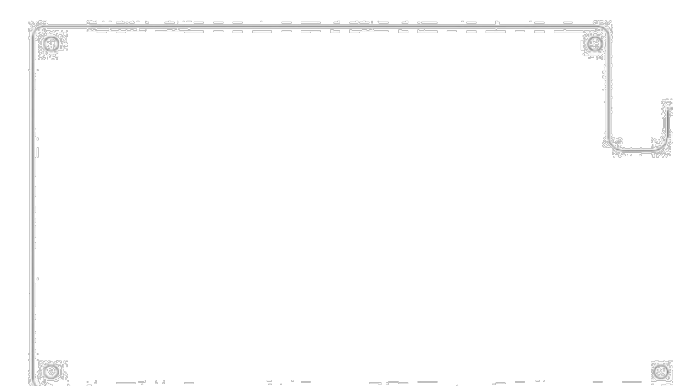
I/O modules includes a RS-422 serial port to communicate with etap ICE, any data collection server, or SCADA server using a RS-422 expansion port. Connection is established with a 6-pair flat cable RJ12 connector. Each I/O auxiliary unit includes up to two I/O cards. Available I/O module configurations:

- 48 Digital Inputs
- 24 Digital Inputs + 8 Digital Output
- 24 Digital Inputs + 8 Analog Inputs (0-20mA)
- 16 Digital Outputs
- 16 Analog Inputs
- Other configurations upon request

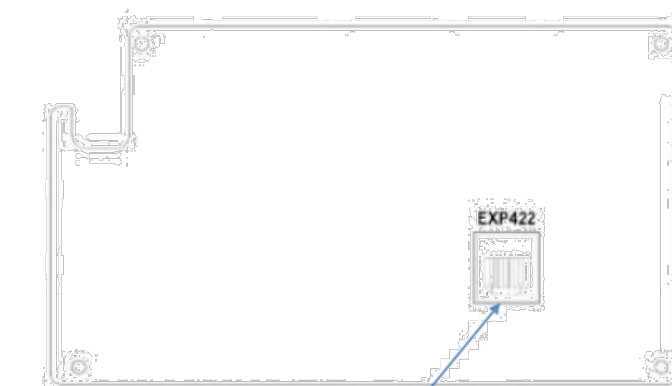
etap ICE Specification Data Sheet

General	Digital Inputs	Relay Outputs	Analog Inputs	Device Features
CPU Features	Isolation	Isolation	Isolation	IEC 60950-1
Communication Ports	Activation/Deactivation	Contact	Accuracy	IEC 60255-5:2000, EN 55022
	Connectors	Connectors	Connectors	IEC 61000-6-4, IEC 61000-5-5, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-9, IEC 61000-4-10, IEC 61000-4-12, IEC 61000-4-16, IEC 61000-4-17, IEC 61000-4-18, IEC 61000-4-29
	Breaking Capacity	Breaking Capacity	Ranges	Operating temperature: -25°C to +70°C
			Power Consumption	IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-3, IEC 60068-2-14, IEC 60068-2-30, IEC 60068-2-38
			Power Supply	IEC 60068-2-6, IEC 60068-2-7
			EMC Type Test	External dimensions: 173 x 137 x 78.4mm
				DIN rail mounting

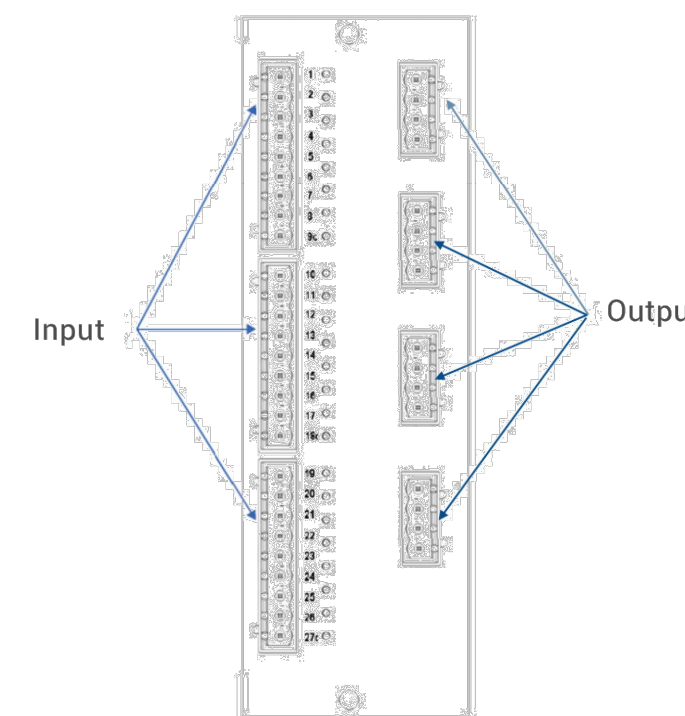
Top View



Bottom View



Front View



No.	Revisions	
	Issue	Date
110822	REVIEW	
120222	REVIEW	
121222	REVIEW	
122022	REVIEW	
090823	BID SET	
092023	PAD UPDATE	

Project Name and Address

UNIVERSITY OF LOUISIANA AT LAFAYETTE-CLECO POWER
2008 HUTCHINSON AVE
CROWLEY, LA 70526

Drawn By
Andrea Lee, Nick Boyd

Sheet

Date
09/15/2022

PV-10.7

Scale
N/A

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