

PHOTOVOLTAIC SYSTEM INSTALLATION

AT

**CHAMPAIGN COUNTY POPE JAIL AND
JUVENILE DETENTION CENTER
502 S. LIERMAN AVE AND 400 ART BARTELL ROAD
URBANA, ILLINOIS 61802**

FOR

**COUNTY OF CHAMPAIGN
102 EAST MAIN STREET
URBANA, ILLINOIS 61802**

PROJECT MANUAL

**CHAMPAIGN COUNTY ITB NO. 2026-004
GHR NO. 7845**

April 9, 2026

SECTION 00 0110

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DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

Section 00 0200 - Notice to Bidders

April 9, 2026

BID: County of Champaign, Illinois
Photovoltaic System Installation
Champaign County Pope Jail and Juvenile Detention Center
Champaign County ITB No. 2026-004
THURSDAY, APRIL 30, 2026
2:00 PM, Public Opening
Putman Meeting Room
Bennett Administrative Center
102 East Main Street No. 500
Urbana, Illinois 61801

Dear Bidder:

The County of Champaign is inviting the submission of sealed bids for Photovoltaic System Installation at the Champaign County Pope Jail and Juvenile Detention Center in Urbana, Illinois.

Specifications are prepared with the intent of offering equal opportunity to all bidders. No oral interpretations will be given to any bidder as to the meaning of the specifications. Requests for clarification must be submitted **in writing** via mail, fax or email to:

GHR Engineers and Associates, Inc.
Attn.: Shannon Hicks
1615 South Neil Street
Champaign, IL 61820
Email: shicks@ghrinc.com

Clarification requests must be received no later than **Monday, April 27, 2026**, 12:00 noon to be considered.

Documents can be procured by emailing Shannon Hicks at the above email address.

Pursuant to the Illinois Prevailing Wage Act (820 ILCS 130/1 et seq.), not less than the prevailing rate of wages as determined by the Illinois Department of Labor, County of Champaign, or court on review shall be paid by the vendor/contractor to all laborers, workers and mechanics performing work under this purchase order.

All bids are to be sealed and in the hands of the undersigned by the due date and time stated above, at which time bids will be publicly opened. There will be no bids accepted after said date and time. Your bid is to be submitted on the bid form provided. The envelope containing your bid is to be sealed and marked in the lower left-hand corner: "**Sealed Bid: Photovoltaic System Installation, Champaign County**". Bids will not be accepted by FAX mail.

The Champaign County Board reserves the right to reject any or all bids, to accept the bids, or to waive any irregularities should it deem to be in the best interest of the County of Champaign to do so. The bids will be awarded to the lowest responsible bidder meeting specifications as determined by the Champaign County Board.

Sincerely,

Michelle Jett
Director of Administration
Champaign County

END OF NOTICE TO BIDDERS 00 0200

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

Section 00 1116 - General Project Information

1.1 PROJECT INFORMATION

- A. Notice to Bidders: Qualified bidders are invited to submit bids for Project as described in this Document.
- B. Project Identification: **Photovoltaic System Installation**
1. Project Location:
- Champaign County Pope Jail and Juvenile Detention Center
502 South Lierman Avenue and 400 Art Bartell Road
Urbana, Illinois 61802
- C. Owner: County of Champaign
1. Owner's Representative:
- Michelle Jett, Director of Administration
102 East Main Street
Urbana, Illinois 61801
Phone: 217.384.3776
Email: physicalplantap@champaigncountyil.gov
- D. Project Design Team: GHR Engineers and Associates, Inc.
- E. Project Description: Project consists of the following:
1. Install an approximate 125kW solar photovoltaic (PV) system at the Champaign County Juvenile Detention Center.
2. Install an approximate 500kW solar photovoltaic (PV) system at the Champaign County Pope Jail.
- F. Construction Contract: Bids will be received for the following Work:
- Single Prime Contract

1.2 BID SUBMITTAL AND OPENING

- A. Owner will receive sealed bids until the bid time and date at the location indicated below. Owner will consider bids prepared in compliance with the Contract Documents issued by Owner, and delivered as follows:
1. **Bid Date: Thursday, April 30, 2026**
2. **Bid Time: 2:00 pm.**
- Location:
- Putman Meeting Room**
Bennett Administrative Center
102 East Main Street
Urbana, Illinois 61801
- B. Bids will be thereafter opened in the presence of the bidders and read aloud.

1.3 BID SECURITY

- A. Bid security in the form of a bank draft/cashier's check, certified check, U.S. money order, or bid bond **payable to County of Champaign** shall be submitted in the amount of **ten (10) percent** of the bid amount. No bids may be withdrawn for a period of **sixty (60) days** after opening of bids. Owner reserves the right to reject any and all bids and to waive informalities and irregularities.

1.4 PREBID CONFERENCE / SITE VISIT

- A. A prebid conference for all bidders will be held on site starting at the Champaign County Juvenile Detention Center, 400 Art Bartell Road, Urbana, Illinois on **Thursday, April 16, 2026** at 10:00 am, local time. Prospective bidders are encouraged to attend.

1.5 DOCUMENTS

- A. Documents can be procured by emailing Shannon Hicks at shicks@ghrinc.com.

1.6 TIME OF COMPLETION

- A. Bidders shall begin the Work on receipt of the Notice to Proceed and shall complete the Work within the Contract Time.
 1. Anticipated Award of Contract: County Board Meeting, **May 21, 2026**.
 2. Anticipated Letter of Notice to Proceed: On or about **May 22, 2026**.
 3. Pre-Construction/Pre-Installation Meeting: TBD.
 4. **Substantial Completion: September 18, 2026.**
 5. Punch List: Issued on or about **September 21, 2026**.
 6. **Final Completion: September 30, 2026.**

1.7 BIDDER'S QUALIFICATIONS

- A. Bidders must be properly licensed under the laws governing their respective trades and be able to obtain insurance and bonds required for the Work. Additional requirements can be found in 26 3100 – Solar Photovoltaic (PV) Systems. **A Performance Bond, a separate Labor and Material Payment Bond, and Insurance in a form acceptable to Owner will be required of the successful Bidder.**

1.8 EXAMINATION

- A. Bidders shall tour the project location to familiarize themselves with the locations of existing equipment to include all the cost of demo and new work as shown on the drawings.

END OF DOCUMENT 00 1116

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

Section 00 2213 - Supplementary Instructions to Bidders

1.1 SUPPLEMENTARY INSTRUCTIONS TO BIDDERS - BIDDER'S REPRESENTATIONS

- A. The Bidder has investigated all required fees, permits, and regulatory requirements of authorities having jurisdiction and has properly included in the submitted bid the cost of such fees, permits, and requirements not otherwise indicated as provided by Owner.
 - 1. Permit Application: Complete building permit application and file with authorities having jurisdiction within five days of the Notice of Award.
- B. The Bidder is a properly licensed Contractor according to the laws and regulations of The State of Illinois and meets qualifications indicated in the Procurement and Contracting Documents.
- C. The Bidder has incorporated into the Bid adequate sums for work performed by installers whose qualifications meet those indicated in the Procurement and Contracting Documents.

1.2 BIDDING DOCUMENTS

- A. Interpretation or Correction of Procurement and Contracting Documents:
 - 1. Submit Bidder's Requests for Interpretation as outlined in the Notice to Bidders.
- B. Submit Requests for Substitution on form provided. Substitution requests shall be in advance of bid.
- C. Addenda:
 - 1. Addenda may be issued at any time prior to the receipt of bids.
 - 2. Owner may elect to waive the requirement for acknowledging receipt of Addenda as follows:
 - a. Information received as part of the Bid indicates that the Bid, as submitted, reflects modifications to the Procurement and Contracting Documents included in an unacknowledged Addendum.
 - b. Modifications to the Procurement and Contracting Documents in an unacknowledged Addendum do not, in the opinion of Owner, affect the Contract Sum or Contract Time.

1.3 BIDDING PROCEDURES

- A. Preparation of Bids:
 - 1. The Bid shall include unit prices when called for by the Procurement and Contracting Documents. Owner may elect to consider unit prices in the determination of award. Unit prices will be incorporated into the Contract.
 - 2. Owner may elect to disqualify a bid due to failure to submit a bid in the form requested, failure to bid requested alternates or unit prices, failure to complete entries in all blanks in the Bid Form, or inclusion by the Bidder of any alternates, conditions, limitations or provisions not called for.
 - 3. **Retail sales tax will NOT be included in the bid amount.** The Owner is exempted by Section 3 of the Illinois Use Tax Act (Section 3, House Bill 1610, approved July 31, 1961, Illinois Revised Statutes 1967, Chapter 120, Section 439.3) from paying any of the taxes imposed by the Act and sales to Owner are exempt by Section 2, House Bill 1609, approved July 31, 1961, Illinois Revised statutes 1967, Chapter 120, Section 441) from any of the taxes imposed by the Act. The Department of Revenue of the State of Illinois under Rule No. 15, issued August 9, 1961, has declared that sales of materials to construction contractors for conversion into real estate for schools, governmental bodies,

agencies and instrumentalities are not taxable retail sales. **The Contractor shall be responsible for any sales, consumer, use and similar taxes for the Work.**

4. Owner is not responsible for any costs incurred by a Contractor in the preparation or delivery of bids. The Contractor shall be responsible for the actual delivery of bids during business hours to the address indicated. Any bid received after the delivery deadline will be disqualified.
5. Owner reserves the right to obtain clarification of any point in a Contractor submittal or to obtain additional information.
6. FOIA: As an independent Contractor of the Owner, records in the possession of the Contractor related to this Agreement may be subject to the Illinois Freedom of Information Act ("FOIA"), 5 ILCS 140/5-1 et seq.; 5 ILCS 140/7(2). The Contractor shall immediately provide the Owner with any such records requested by the Owner in order to timely respond to any FOIA request received by the Owner.

B. Subcontractors, Suppliers, and Manufacturers List Bid Supplement:

1. Provide list of major subcontractors, suppliers, and manufacturers furnishing or installing products no later than **ten (10) business days** following Notice to Proceed. Do not change subcontractors, suppliers, and manufacturers from those submitted without approval of Owner.

1.4 CONSIDERATION OF BIDS

A. Rejection of Bids:

1. Owner reserves the right to reject a bid based on Owner's and Design Team's evaluation of qualification information submitted following opening of bids. Owner's evaluation of the Bidder's qualifications will include: status of licensure and record of compliance with licensing requirements, record of quality of completed work, record of Project completion and ability to complete, record of financial management including financial resources available to complete Project and record of timely payment of obligations, record of Project site management including compliance with requirements of authorities having jurisdiction, record of and number of current claims and disputes and the status of their resolution, and qualifications of the Bidder's proposed Project staff and proposed subcontractors.

1.5 PERFORMANCE BOND AND PAYMENT BOND

- A. Both a Performance Bond and a Payment Bond will be required, each in an amount equal to 100 percent of the Contract Sum.
- B. The Bidder shall deliver the required bonds to Owner no later than ten (10) days after the date of Notice of Intent to Award and no later than the date of execution of the Contract, whichever occurs first. Owner may deem the failure of the Bidder to deliver required bonds within the period of time allowed a default.
- C. Bonds shall be executed and be in force on the date of the execution of the Contract.

1.6 INSURANCE

- A. GENERAL The successful bidder shall maintain for the duration of the contract and any extensions thereof, at bidder's expense, insurance that includes "Occurrence" basis wording and is issued by a company or companies qualified to do business in the State of Illinois that are acceptable to the County, which generally requires that the company(ies) be assigned a Best's Rating of A or higher with a Best's financial size category of Class A-/VII or higher, in the following types and amounts:

1. Commercial General Liability in a broad form, to include, but not limited to, coverage for the following where exposure exists: Bodily Injury and Property Damage, Premises/Operations, Independent contractors, Products/Completed Operations, Personal Injury and Contractual Liability; limits of liability not less than: \$1,000,000 per occurrence and \$2,000,000 in the aggregate, and inclusion of a waiver of subrogation in favor of Champaign County;
2. Business Auto Liability to include, but not be limited to, coverage for the following where exposure exists: Owned Vehicles, Hired and Non-Owned Vehicles and Employee NonOwnership; limits of liability not less than: \$1,000,000 per occurrence, combined single limit for: Bodily Injury Liability and Property Damage Liability;
3. Workers' Compensation Insurance to cover all employees and meet statutory limits in compliance with applicable state and federal laws. The coverage must also include Employer's Liability with minimum limits of \$500,000 for each incident, \$500,000 for each disease and \$500,000 aggregate, and a waiver of subrogation in favor of Champaign County.

B. EVIDENCE OF INSURANCE The successful bidder agrees that with respect to the above required insurance that:

1. The County of Champaign shall be provided with Certificates of Insurance evidencing the above required insurance, prior to commencement of the contract and thereafter with certificates evidencing renewals or replacements of said policies of insurance at least fifteen (15) days prior to the expiration or cancellation of any such policies;
2. The contractual liability arising out of the contract shall be acknowledged on the Certificate of Insurance by the insurance company;
3. The County of Champaign shall be provided with thirty (30) days prior notice, in writing, of Notice of Cancellation or material change and said notification requirement shall be stated on the Certificate of Insurance;
4. Subcontractors, if any, shall execute the Subcontractor Agreement provided by Champaign County, and comply with the same insurance requirements as contractors.
5. In addition to being named as an additional insured on the Certificate of Insurance, each liability policy shall contain an endorsement naming the County of Champaign, Illinois as an additional insured. A copy of the endorsement shall be provided to Champaign County along with the Certificate of Insurance; and,
6. Champaign County, Illinois must be named as an additional insured, on a primary and noncontributory basis, and the address for certificate holder must read exactly as: County of Champaign, a body politic 102 East Main Street, Urbana, IL 61801.
7. Insurance Notices and Certificates of Insurance shall be provided to: Champaign County, Insurance Specialist, Administrative Services Department, 102 East Main Street, Urbana, IL 61801.

1.7 STANDARD CONTRACT CONDITIONS

- A. This contract shall be governed in all aspects as to validity, construction, capacity, performance, or otherwise by the laws of the State of Illinois.
- B. Contractors shall comply with the Civil Rights Act of 1964, as amended, all applicable State and Federal non-discrimination laws including but not limited to the Family and Medical Leave Act, the Americans with Disabilities Act, the Age Discrimination in Employment Act and shall comply with the provisions of the Illinois Human Rights Act.
- C. Contractors shall not assign, transfer, convey, sublet, or otherwise dispose of this contract, including any or all of it right, title or interest therein, or its power to execute such contract to any person, company or corporation, without prior written consent of The County of Champaign.

- D. By submitting a bid the Contractor certifies that the Contractor is not barred from bidding on this contract as a result of a violation of either the bid-rigging or bid-rotating provisions of Article 33E of the Criminal Code of 1961, as amended.
- E. By submitting a bid, the Contractor, having 25 or more employees, does hereby certify pursuant to Section 3 of the Illinois Drug-Free Workplace Act (30 ILCS 580/3) that it shall provide a drug-free workplace for all employees engaged in the performance of work under the contract by complying with the requirements of the Illinois Drug-Free Workplace Act and, further certifies, that it is not ineligible for award of this contract by reason of debarment for a violation of the Illinois Drug-Free Workplace Act.
- F. By submitting a bid, the Contractor does hereby certify pursuant to Section 2-105 of the Illinois Human Rights Act (775 ILCS 5/2-105) that it has a written sexual harassment policy that includes, at a minimum, the following information: (i) the illegality of sexual harassment; (ii) the definition of sexual harassment under State law; (iii) a description of sexual harassment, utilizing examples; (iv) an internal complaint process including penalties; (v) the legal recourse, investigative and complaint process available through the Department of Human Rights and Human Rights Commission; (vi) direction on how to contact the Department of Human Rights and Human Rights Commission; and (vii) protection against retaliation.

1.8 STATEMENT OF NON-DISCRIMINATION

- A. The Illinois Human Rights Acts prohibits discrimination on the basis of: “race, color, religion, sex, national origin, ancestry, age, order of protection status, marital status, physical or mental disability, military status, sexual orientation, pregnancy, or unfavorable discharge from military service in connection with employment, real estate transactions, access to financial credit, and the availability of public accommodations.” It also prohibits sexual harassment and discrimination in employment on the basis of citizenship status or work authorization status.

1.9 PREVAILING WAGE

- A. This contract calls for the construction of a “public work” within the meaning of the Illinois Prevailing Wage Act, 820 ILCS 130/0.01. The Act requires contractors and subcontractors to pay all laborers, workers and mechanics performing services on public works projects no less than the “prevailing rate of wages” (hourly cash wages plus fringe benefits) in the county where the work is performed. Each Contractor and Subcontractor rendering services under this contract must comply with all requirements of this Act. Each Contractor and Subcontractor shall keep records of the prevailing wages paid to their employees, submit a monthly certified payroll to County of Champaign, and make such records available to County of Champaign for inspection upon seven business days notice.
- B. For information regarding the current prevailing wage rates for Champaign County, Illinois can be found at: <https://labor.illinois.gov/laws-rules/conmed/rates.html>
- C. Prevailing Wage Rates change periodically. Contractor shall verify and revise the prevailing wages on a regular basis.

1.10 FAILURE TO FULFILL CONTRACT

- A. When any Contractor fails to provide a service or provides a service which does not conform to the specifications, County of Champaign may, at its sole discretion, annul and set aside the contract entered into with said Contractor, either in whole or in part, and make and enter into a new contract for the same services in such manner as seems to County of Champaign to be to its best advantage. Any failure to furnish services by reason of the failure of the Contractor, as stated above, shall be a liability against such Contractor and his sureties. County of Champaign reserves the right to cancel, without penalty, any services which the successful Contractor may be unable to furnish because of economic conditions, governmental regulations or other similar

causes beyond the control of the Contractor provided satisfactory proof is furnished to County of Champaign if requested.

- B. Without Cause Termination: The County may terminate its contract with the Contractor without cause after providing the Contractor with thirty (30) days written notice.

1.11 EXECUTION OF THE CONTRACT

- A. Subsequent to the Notice of Intent to Award, and within ten (10) business days after the prescribed Form of Agreement is presented to the Awardee for signature, the Awardee shall execute and deliver the Agreement to Owner through Engineer, in such number of counterparts as Owner may require.
- B. Owner may deem as a default the failure of the Awardee to execute the Contract and to supply the required bonds and insurance when the Agreement is presented for signature within the period of time allowed.
- C. Unless otherwise indicated in the Procurement and Contracting Documents of the executed Agreement, the date of commencement of the Work shall be the date of the executed Agreement.
- D. In the event of a default, Owner may declare the amount of the Bid security forfeited and elect to either award the Contract to the next responsible bidder or re-advertise for bids.

1.12 INDEMNITY

- A. To the fullest extent permitted by law, Contractor shall indemnify, defend and hold harmless Champaign County and any of its members, directors, officers, employees, agents and representatives from and against any and all liability, loss, costs, causes of actions, demands, attorney fees, expenses, claims, suits and judgments of whatsoever kind and character, including without limitation, all possible costs of responding to demands, in whatever form that may take, with respect to any claim made against Champaign County that arises solely from an act, failure or omission on the part of the County, or any of their members, officers, employees, agents, representatives, and volunteers in carrying out the terms of the Agreement.

1.13 PROJECT LABOR AGREEMENT

- A. This project is subject to a project labor agreement (PLA).

END OF DOCUMENT 00 2213

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

Section 00 4113 - Bid Form - Stipulated Sum

1.1 BID INFORMATION

A. Bidder: _____.

B. Project Name: **Photovoltaic System Installation**

C. Project Location:

Champaign County Pope Jail and Juvenile Detention Center
502 South Lierman Avenue and 400 Art Bartell Road
Urbana, Illinois 61802

D. Owner: County of Champaign

E. Building Design Team: GHR Engineers and Associates, Inc.

1.2 CERTIFICATIONS AND BASE BIDS

A. Owner reserves the right to award bid based on a single facility or combined price for both facilities.

B. Bid No. 1, Single-Prime (All Trades) Contract: The undersigned Bidder, having carefully examined the Procurement and Contracting Requirements, Conditions of the Contract, Drawings, Specifications, and all subsequent Addenda, as prepared by the Design Team, having visited the site, and being familiar with all conditions and requirements of the Work, hereby agrees to furnish all material, labor, equipment and services, including all scheduled allowances, necessary to complete the construction of the work associated with the **Champaign County Juvenile Detention Center**, according to the requirements of the Procurement and Contracting Documents, for the stipulated sum of:

1. _____ Dollars (\$_____).

C. Bid No. 2, Single-Prime (All Trades) Contract: The undersigned Bidder, having carefully examined the Procurement and Contracting Requirements, Conditions of the Contract, Drawings, Specifications, and all subsequent Addenda, as prepared by the Design Team, having visited the site, and being familiar with all conditions and requirements of the Work, hereby agrees to furnish all material, labor, equipment and services, including all scheduled allowances, necessary to complete the construction of the work associated with the **Champaign County Pope Jail**, according to the requirements of the Procurement and Contracting Documents, for the stipulated sum of:

1. _____ Dollars (\$_____).

1.3 BID GUARANTEE

A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within **ten (10)** days after a written Notice of Award, if offered within **sixty (60)** days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached bank draft/cashier's check, certified check, U.S. money order, or bid bond **payable to County of Champaign**, as liquidated damages for such failure, in an amount constituting **ten percent (10%)** of the Bid No. 1 and Bid No. 2 amounts:

1. Base Guarantee:

a. _____ Dollars (\$_____).

- B. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the bank draft/cashier's check, certified check, U.S. money order, or bid bond.

1.4 SUBCONTRACTORS AND SUPPLIERS

- A. The following companies shall execute subcontracts for the portions of the Work indicated:

- 1. Electrical Work: _____.

1.5 TIME OF COMPLETION

- A. The undersigned Bidder proposes and agrees hereby to commence the Work of the Contract Documents on a date specified in a written Notice to Proceed to be issued by Owner, and shall fully complete the Work as indicated in the Invitation to Bid.

1.6 ACKNOWLEDGEMENT OF ADDENDA

- A. The undersigned Bidder acknowledges receipt of and use of the following Addenda in the preparation of this Bid:

- 1. Addendum No. 1, dated _____.

- 2. Addendum No. 2, dated _____.

- 3. Addendum No. 3, dated _____.

1.7 CONTRACTOR'S LICENSE

- A. The undersigned warrants that he/she is duly authorized to bind contractually the entity submitting this bid, to fully perform all duties and to deliver all services in accordance with the terms and conditions set forth herein. All signatures to be sworn before a Notary Public.

1.8 SUBMISSION OF BID

Respectfully submitted this ____ day of _____, 2026.

Submitted By: _____
(Name of bidding firm or corporation)

Authorized Signature: _____
(Handwritten signature)

Signed By: _____
(Type or print name)

Title: _____
(Owner/Partner/President/Vice President)

Witness By: _____
(Handwritten signature)

Attest:

(Handwritten signature)

By:

(Type or print name)

Subscribed and sworn to before me this

_____ Day of _____, 2026.

_____, Notary Public

(Affix Notary Seal Here)

END OF DOCUMENT 00 4113

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

Section 00 4313 - Bid Security Forms

1.1 BID FORM SUPPLEMENT

- A. A completed bid bond form is required to be attached to the Bid Form.

1.2 BID BOND FORM

- A. AIA Document A310, "Bid Bond" is the recommended form for a bid bond. A bid bond acceptable to Owner, is required to be attached to the Bid Form as a supplement.
- B. Copies of AIA standard forms may be obtained from The American Institute of Architects. www.aia.org/contractdocs/purchase/index.htm; email: docspurchases@aia.org; 800.942.7732.

END OF DOCUMENT 00 4313

**AGREEMENT
BETWEEN THE
EAST CENTRAL ILLINOIS BUILDING & CONSTRUCTION TRADES COUNCIL
AND
CHAMPAIGN COUNTY, ILLINOIS**

1. This Agreement is entered into to facilitate the timely completion of a specific upcoming construction and renovation project at Champaign County (“the County”), namely the project commonly referred to as the Photovoltaic System Installation Project, ITB #2026-004 (the “Project”).
2. The County provides vital services to the citizens of Champaign County that require the timely completion of projects within precise and limited time parameters. Strikes and other work stoppages could delay the completion of certain projects, disadvantaging the County’s residents. Skilled craftsmen are needed by the County to achieve the quality of workmanship essential to meeting public expectations and interests. Furthermore, the parties to this Agreement believe it to be in their mutual interest to promote the efficiency of construction operations and provide for peaceful settlement of labor disputes without strikes or lockouts, thereby promoting the public interest in assuring the timely and economical completion of the work. It is also the intent of the parties to set standard working conditions for the efficient performance of work at the County, to establish and maintain harmonious relations between all parties to the Agreement, to secure optimum productivity and to eliminate strikes, lockouts, or delays in the performance of work at the County.
3. The County agrees to include the attached Project Labor Agreement (“PLA”), or mutually agreed successor versions, as part of the Request for Proposals (“RFP”) for the Project, which is a construction and/or renovation project estimated to cost Thirty Thousand Dollars (\$30,000.00) or more as determined by the County.
4. Any firm, union affiliated or not, may bid on the Project pursuant to the RFP process. To be awarded a contract, successful bidders must become a party to the PLA or a substantially similar successor version as may be reasonably negotiated and mutually agreed upon between the bidder and the County. This Agreement applies only to this Project.
5. The East Central Illinois Building & Construction Trades Council (“the ECIBCTC”), its member unions, agents, affiliates and surrogates agree to not stop, delay, interrupt, strike, picket, harass or interfere in any way with construction projects, contractors, or employees engaged in County projects covered by a PLA. Any interference, whether lawful or not, shall terminate this Agreement.
6. In the event that no qualified bidders bid on a project, or portion thereof, the County reserves the right to request new proposals without including the PLA.
7. In the event that there is insufficient labor available through ECIBCTC member Unions to staff construction projects, the County reserves the right to exclude the PLA as a requirement from any or all solicitations for construction until such time as sufficient labor is made available. The County will make efforts to consult with the ECIBCTC prior to excluding the PLA. The ECIBCTC will be provided an opportunity to remedy the labor insufficiency prior to the PLA being excluded. The County reserves the sole right to determine the sufficiency of available labor. Nothing in this Agreement shall preclude the County from utilizing or assigning County employees to perform assigned work.
8. All parties agree to cooperate to promote a diverse workforce and equal opportunity in employment, as detailed in Article 14 of the attached PLA.

9. The term of this Agreement is two years, beginning on the date of execution below, 2025, and ending on the same day and month one year thereafter, 2025, unless extended by mutual agreement as detailed in paragraph 10.
10. Neither party to this Agreement shall be obligated to enter into any negotiations for the renewal or extension of this Agreement. If either party desires to renew or extend the Agreement, such party will notify the other party in writing at least ninety (90) days prior to the expiration date.

IN WITNESS WHEREOF, the East Central Illinois Building & Construction Trades Council and Champaign County have caused this Agreement to be executed in their respective capacities effective this _____ day of _____, 2026.

Champaign County (County)

**East Central Illinois Building & Construction
Trades Council (ECIBCTC)**

Steve Summers,
County Executive

President of ECIBCTC

Attest: _____
Aaron Ammons, County Clerk
And *Ex-Officio* Clerk of the
Champaign County Board

Vice President of ECIBCTC

Secretary/Treasurer of ECIBCTC

RE: Project RFP / PLA

PLA-RELATED CONTRACT TERMS

Equal Opportunity in Employment & Project Labor Agreement Provision

For the purposes of this provision, "contracting entity" means the legal entity that has signed a contract to provide services or perform work or to provide personal property or a combination thereof to or on behalf of the County. The words used herein and the requirements shall be interpreted in accordance with and have the meaning ascribed to them as set forth in Article 14 of the Project Labor Agreement.

- (1) *Non-discrimination pledge.* The contracting entity shall not discriminate against any employee during the course of employment or application for employment on the basis of race, color, religion, national origin, ancestry, sex (including pregnancy), gender identity or expression, age, citizenship status, marital status, sexual orientation, genetic information, order of protection status, arrest record, military status, physical or mental disability unrelated to an individual's ability to perform the essential functions of their job with or without reasonable accommodations, or unfavorable discharge from the military.
- (2) The contracting entity shall make good faith efforts in accordance with its affirmative action plan and utilization plan, if one is required to be submitted to and approved by the County, to achieve female and minority participation goals by hiring and partnering with WBEs, MBEs, and female and minority workers. Good faith efforts are defined in Article 14 of the Project Labor Agreement regarding this project.
- (3) *Notices.* The contracting entity shall post notices regarding non-discrimination in conspicuous places available to employees and applicants for employment. The notices shall be provided by the County, setting forth the provisions of the non-discrimination pledge; however, the contracting entity may post other notices of similar character supplied by another governmental agency in lieu of the County's notice.
- (4) *Employment relations.* The contracting entity shall send to each labor union, employment service agency, or representative of workers with which the contracting entity has a collective bargaining agreement or other contract or understanding, a copy of the contracting entity's notice regarding the non-discrimination pledge.
- (5) *Solicitation and ads for employment.* The contracting entity shall, in all solicitations and advertisements for employees placed by or on behalf of the contracting entity, state "This is an Equal Opportunity Employer."
- (6) *Access to books.* The contracting entity shall permit access to all books, records and accounts pertaining to its employment practices by the County Executive or the County Executive's designee for purposes of investigation to ascertain compliance with these provisions and the Project Labor Agreement.
- (7) *Reports.* The contracting entity shall provide periodic compliance reports to the County Executive, upon request. Such reports shall be within the time and in the manner proscribed by the County and describe efforts made to comply with the provisions of the Project Labor Agreement.
- (8) *Remedies.* In the event that any contracting entity fails to comply with the above subsections, or fails to comply with or make good faith efforts to comply with its affirmative action plan, utilization plan, or any provision of county, state or federal law relating to human rights, after the County

has provided written notice to the contracting entity of such failure to comply and provided the contracting entity with an opportunity to cure the non-compliance, then the County, at its option, may declare the contracting entity to be in default of this agreement and take, without election, any or all of the following actions:

- (i) Cancel, terminate or suspend the contract in whole or in part;
 - (ii) Declare the contracting entity ineligible for further contracts for up to one calendar year;
 - (iii) Recover from the contracting entity by set-off against the unpaid portion of the contract price, or otherwise recover money due to the contracting entity pursuant to the contract, the sum of fifty dollars (\$50.00) per day, as liquidated damages and not as a penalty, for each day after the date of the notice that the contracting entity fails to comply with these provisions of the contract, as determined by the County Executive, the said sum being fixed and agreed upon by and between the contracting entity and the County because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages which the County would sustain in the event of such breach of contract, and said amount is agreed to be the amount of monetary damages which the County would sustain;
 - (iv) Seek other contractual remedies or sanctions allowable by law.
- (9) Construction contractors shall automatically include the provisions of the foregoing paragraphs in every construction subcontract so that the provisions will be binding upon each construction subcontractor.

East Central Illinois Building & Construction Trades Council

Project Labor Agreement

This Agreement is entered into this _____ day of _____, 2026, by and between _____ and the East Central Illinois Building and Construction Trades Council (ECIBCTC) for and on behalf of its affiliates, individually and collectively, hereinafter referred to as the "Union". This Agreement shall apply to work performed by the Employer (Champaign County) and its Contractors and Subcontractors on

Construction known as the **Photovoltaic System Installation Project**, hereinafter referred to as the "Project".

Article 1 - Intent and Purposes

1.1 It is mutually understood that the following terms and conditions relating to employment of workmen covered by this Agreement have been written in order to promote efficiency of construction operations and provide for peaceful settlement of labor disputes without strikes or lockouts, thereby promoting the public interest in assuring the timely and economical completion of the work. It is also the intent of the parties to set out standard working conditions for the efficient prosecution of said construction work, herein to establish and maintain harmonious relations between all parties of the Agreement, to secure optimum productivity and to eliminate strikes, lockout, or delays in the prosecution of the work.

(a) Therefore, the following provisions will be binding upon _____ and all its sub-contractors (herein jointly referred to as "Contractor"), who shall be required to sign the Participation Agreement, attached hereto as Exhibit A, and the Unions during the term of this Agreement and any renewal thereafter. The Unions hereby consent to apply the terms and conditions of this Project Agreement to said sub-contractors upon their signing the Participation Agreement. It is understood that each sub-contractor will be considered and accepted by the Unions as a separate employer for the purposes of collective bargaining. It is further agreed that the employees working under this Agreement shall constitute a bargaining unit separate and distinct from all others. This agreement may be modified by mutual consent in writing by the parties' signatory hereto.

(b) Nothing in this Agreement shall preclude the County from utilizing or assigning County employees to perform assigned work.

1.2 The Contractor agrees to be bound by the terms of the applicable Collective Bargaining Agreements and amendments thereto of the affiliates of the East Central Illinois Building and Construction Trades Council and the applicable employers association, if any. The applicable Collective Bargaining Agreement is that which predominates in Champaign County for the particular work performed by the Contractor. Such agreements are incorporated herein by reference, except that the work of the International Union of Elevator Constructors on this Project shall be performed under the terms of its National Agreements, with the exception of Article XI, XII, and XIII of this Project Labor Agreement, which shall apply to work. It is mutually understood that where the provisions of this Agreement are at variance with any other agreement between the Contractor and the Union, the language of this Agreement shall prevail. In order to comply with the requirements of the various fringe benefit funds to which the Contractor is to contribute, the Contractor shall sign the applicable participation agreements when necessary.

1.3 The Contractor and the Union agree that should the collective Bargaining Agreement (CBA) of any ECIBCTC affiliate signatory to this Agreement will expire prior to the completion of this project, the expired contracts' terms will be maintained until a new CBA is ratified. The wages and fringe benefits included in any new CBA will be effective on the effective date of the newly negotiated CBA unless wage and fringe benefit retroactively is agreed upon by both bargaining parties.

Article 2 - Recognition

2.1 The Contractor recognizes the ECIBCTC and the signatory affiliates as the sole and exclusive bargaining representatives for its craft employees employed on the jobsite. ECIBCTC affiliates signatory to this Agreement will have recognition on the project for their craft.

Article 3 - Administration of Agreement

3.1 In order to assure that all parties have a clear understanding of the Agreement, to promote harmony and address potential problems, a pre-job conference will be held with the Contractor, the County, ECIBCTC representatives, and all signatory parties prior to the start of any work on the project.

3.2 Representatives of the Contractor, the County, or the ECIBCTC may at any time require a meeting to review the operation of this Agreement. Said meeting shall take place within one week of the written request. The representatives at this meeting shall be empowered to resolve any dispute over the intent and application of the Agreement.

3.3 The Contractor shall make available in writing to the ECIBCTC no less than two days prior to these meetings, a job status report, planned activities for the next 30 day period, actual number of craft employees on the project and estimated numbers of employees by craft required for the next 30 day period. The purpose of this report is to allow time to address any potential jurisdictional problems and to ensure that no party signatory to the Agreement is hindering the continuous progress of the project through a lack of planning or shortage of manpower.

3.4 ECIBCTC shall supply a Union Contact List, attached hereto as Exhibit B, and shall provide an updated Union Contact List to both the Contractor and the County within one week of any change to the information therein.

3.5 The Contractor shall supply the County with a fully signed copy of this Agreement immediately after its execution. The Contractor shall have a continuing duty to promptly supply the County with complete copies of all signed Participation Agreements.

Article 4 - Hours of Work Overtime Shifts and Holidays

4.1 The standard work day shall be an established consecutive eight (8) hour period between the hours of 7:00 a.m. and 5:00 p.m. with one-half hour designated as unpaid period for lunch. The standard work week shall be five (5) consecutive days of work commencing on Monday. Starting time, which is to be established at the pre-job conference, will be applicable to all craft employees on the project. Changes in the standard work day and week must be requested in writing and approved by the County. Should job conditions dictate a change in the established starting time and/ or a staggered lunch period on certain work of the project or with individual crafts, the Contractor, Business Managers of the crafts involved and the ECIBCTC shall mutually agree to such changes. If work schedule change cannot be mutually agreed to between these parties, the hours fixed in the Agreement shall prevail.

4.2 All time before and after the established workday of eight (8) hours, Monday through Friday and all the time on Saturday shall be paid in accordance with each craft's current Collective Bargaining Agreement. All time on Sundays and Holidays shall be paid for at the rate of double time. Fringe benefit payments for all overtime work shall be paid in accordance with each craft's Current Collective Bargaining Agreement.

4.3 Shifts may be established when considered necessary by the Contractor. Shift pay shall be in accordance with each craft's current Collective Bargaining Agreement. Shifts when established shall continue for a minimum of five (5) consecutive days. Changes in shift must be requested in writing and approved by the County.

4.4 Recognized Holidays shall be as follows: New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, the day after Thanksgiving Day and Christmas Day. No work will be performed on Labor Day under any consideration, except in an extreme emergency and then only after consent has been given by the Business Manager.

Article 5 - Absenteeism

5.1 The Contractor and the Union agree that chronic and/or unexcused absenteeism is undesirable and must be controlled. Employees that develop a record of such absenteeism shall be identified by the Contractor to the appropriate referral facility and the Contractor shall support such action with the work record of the involved employee. Any employee terminated for such absenteeism shall not be eligible for rehire on the project for a period of no less than ninety (90) days.

Article 6 - Management Rights

6.1 The Contractor retains and shall exercise full and exclusive authority and responsibility for the management of its operations, except as expressly limited by the terms of this Agreement.

Article 7 - General Working Conditions

7.1 Employment begins and ends at the project site.

7.2 Employees shall be at their place of work at the starting time and shall remain at their place of work until quitting time. The parties reaffirm their policy of a fair days work for a fair days pay.

7.3 The Contractor may utilize brassing, time clocks or other systems to check employees in and out. Should such procedures be required, the techniques and rules regarding such procedures shall be established by mutual consent of the parties at the pre-job conference.

7.4 There shall be no limit on production by workmen or restrictions on the full use of tools or equipment. Craftsmen using tools shall perform any work of the trades and shall work under the direction of the craft foreman. There shall be no restrictions on efficient use of manpower other than as may be required by safety regulations.

7.5 Crew Foreman shall be utilized as per the existing collective bargaining agreements. The Contractor agrees to allow crew foremen ample time to direct and supervise their crew. The Union agrees there will be no restrictions placed on crew foremen's ability to handle tools and materials.

7.6 The Contractor may utilize the most efficient methods or techniques of construction tools or other labor-saving devices to accomplish the work.

7.7 The Contractor may establish such reasonable project rules as the Contractor deems appropriate. These rules will be reviewed and established at the pre-job conference and posted at the project site by the Contractor.

7.8 It is recognized that specialized or unusual equipment may be installed on the project and in such cases, the Union recognizes the right of the Contractor to involve the equipment supplier or vendor's personnel in supervising the setting of the equipment. These personnel may make modifications and final alignment which may be necessary prior to and during the start-up procedure in order to protect factory warranties.

7.9 In order to promote a harmonious relationship between the equipment or vendor's personnel and the Building Trades craftsmen, a meeting shall be held between the Contractor and the ECIBCTC prior to any involvement on the project by these personnel. The Contractor will inform the ECIBCTC of the nature

of involvement by these personnel and the numbers of personnel to be involved, allowing ample time for the Union representatives to inform their stewards prior to the start of any work.

7.10 Equipment or material delivered to the job site will be unloaded promptly without regard to jurisdictional disputes which will be handled as per the provisions of this Agreement. The Contractor will supply ECIBCTC and affiliated unions with delivery schedules, allowing as much time as possible to ensure the appropriate crafts will be available to unload the materials or equipment.

Article 8 - Safety

8.1 The employees covered by the terms of this Agreement shall at all times while in the employ of the Contractor be bound by the safety rules and regulations as established by the Contractor in accordance with the Construction Safety Act and OSHA. These rules and regulations will be published and posted at conspicuous places throughout the project.

8.2 In accordance with the requirements of OSHA, it shall be the exclusive responsibility of each Contractor on a jobsite to which this Agreement applies, to assure safe working conditions for its employees and compliance by them with any safety rules contained herein or established by the Contractor. Nothing in this Agreement will make the ECIBCTC or any of its affiliates liable to any employees or to other persons in the event that injury or accident occurs.

Article 9 - Subcontracting

9.1 The Project Contractor agrees neither it nor any of its contractors or subcontractors will subcontract any work to be done on the Project except to a person, firm or corporation who is or agrees to become party to this Agreement. Any contractor or subcontractor working on the Project, shall, as a condition to working on said Project, become signatory to and perform all work under the terms of this Agreement. The furnishing of materials, supplies or equipment and the delivery thereof shall in no case be considered subcontracting, with the exception of ready mix, aggregate, asphalts, brick, block, drywall, and trash removal.

Article 10 - Union Representation

10.1 Authorized representatives of the ECIBCTC and its signatory affiliates shall have access to the project provided they do not interfere with the work of the employees and further provided that such representatives fully comply with the visitor and security rules established for the project.

10.2 Each ECIBCTC affiliate which is a party to this Agreement shall have the right to designate a working journeyman as a steward. Such designated steward shall be a qualified worker performing the work of that craft and shall not exercise any supervisory functions. Each steward shall be concerned with the employees of the steward's employer and not with the employees of any other employer.

10.3 The working steward will be paid at the applicable wage rate for the job classification in which he is employed.

10.4 The working steward shall not be discriminated against because of his activities in performing his duties as steward, and except as otherwise provided in local agreements, shall be the last employee in his craft to be laid off in any reduction in force. Stewards will be subject to discharge to the same extent that other employees are only after notification to the Union Representative. The Contractor will permit stewards sufficient time to perform the duties inherent to a steward's responsibilities. Stewards will be offered available overtime work if qualified.

Article 11 - Work Stoppages and Lockouts

11.1 During the term of this Agreement there shall be no strikes, picketing, work stoppages, slowdowns or other disruptive activity for any reason by the ECIBCTC, its affiliates or by any employee and there shall be no lockout by the Contractor. Failure of any Union or employee to cross any picket line established at the project site is a violation of this Article.

11.2 The ECIBCTC and its affiliates shall not sanction, aid or abet, encourage or continue any work stoppages, picketing or other disruptive activity and will not make any attempt of any kind to dissuade others from making deliveries to or performing services for or otherwise doing business with the Contractor at the project site. Should any of these prohibited activities occur the Union will take the necessary action to end such prohibited activities.

11.3 No employee shall engage in any activities which violate this Article. Any employee who participates in or encourages any activities which interfere with the normal operation of the project shall be subject to disciplinary action, including discharge, and if justifiably discharged for the above reasons, shall not be eligible for rehire on the same project for a period of not less than ninety (90) days.

11.4 Neither the ECIBCTC nor its affiliates shall be liable for acts of employees for which it has no responsibility. The principal officer or officers of the ECIBCTC will immediately instruct order and use the best efforts of his office to cause the affiliated union or unions to cease any violations of this Article. The ECIBCTC in its compliance with this obligation shall not be liable for unauthorized acts of its affiliates. The principal officer or officers of any involved affiliate will immediately instruct, order or use the best effort of his office to cause the employees the union represents to cease any violations of this Article. A union complying with this obligation shall not be liable for unauthorized acts of employees it represents. The failure of the Contractor to exercise its right in any instance shall not be deemed a waiver of its right in any other instance.

11.5 In lieu of any action at law or equity, any party shall institute the following procedure when a breach of this Article is alleged; after all involved parties have been notified.

(a) The party invoking this procedure shall notify an individual to be mutually agreed upon; whom the parties agree shall be the permanent arbitrator under this procedure. In the event the permanent arbitrator is unavailable at any time, he shall appoint his alternate. Notice to the arbitrator shall be by the most expeditious means available, with notice by service with delivery confirmation to the party alleged to be in violation and all involved parties.

(b) Upon receipt of said notice the arbitrator named above shall set and hold a hearing within twenty-four (24) hours if it is contended the violation still exist but not before twenty-four (24) after the service with delivery confirmation notice to all parties involved as required above.

(c) The Arbitrator shall notify the parties by service with delivery confirmation of the place and time he has chosen for this hearing. Said hearing shall be completed in one session. A failure of any party or parties to attend said hearing shall not delay the hearing of evidence or issuance of an Award by the Arbitrator.

(d) The sole issue at the hearing shall be whether or not a violation of this Article has in fact occurred. The Award shall be issued in writing within three (3) hours after the close of the hearing and may be issued without an Opinion. If any party desires an Opinion, one shall be issued within fifteen (15) days, but its issuance shall not delay compliance with, or enforcement of, the Award. The Arbitrator may order cessation of the violation of this Article, and such Award shall be served on all parties by hand or registered mail upon issuance.

(e) Such Award may be enforced by any court of competent jurisdiction upon the filing of the Agreement and all other relevant documents referred to hereinabove in the following manner.

Written notice by service with delivery confirmation of the filing of such enforcement proceedings shall be given to the other party. In the proceeding to obtain a temporary order enforcing the Arbitrator's Award as issued under this Article, all parties waive the right to a hearing and agree that such proceedings may be ex parte. Such agreement does not waive any party's right to participate in a hearing for a final order of enforcement. The Court's order or orders enforcing the Arbitrator's Award shall be served on all parties by hand or by delivery to their last known address or by service with delivery confirmation.

(f) Any rights created by statute or law governing arbitration proceedings inconsistent with the above procedure or which interfere with compliance therewith are hereby waived by parties to whom they accrue.

(g) The fees and expenses of the Arbitrator shall be borne by the party or parties found in violation. In the event that no violation is found, such fees and expenses shall be borne by the moving party.

Article 12 - Disputes and Grievances

12.1 This Agreement is intended to provide close cooperation between management and labor. Each of the Unions will assign a representative to this Project for the purpose of completing the construction of the Project economically, efficiently, continuously, and without interruption, delays, or work stoppages.

12.2 The Contractors, Unions, and the employees, collectively and individually, realize the importance to all parties to maintain continuous and uninterrupted performance of the work of the project, and agree to resolve disputes in accordance with the grievance-arbitration provisions set forth in this Article, except when any craft which has a no strike, no lockout grievance procedure which results in final and binding arbitration, then they shall use their local grievance procedures to settle such disputes.

12.3 Any questions or dispute arising out of and during the term of this Project Agreement (other than Trade jurisdictional disputes) shall be considered a grievance and subject to resolution under the following procedures:

Step 1: (a) When any employee subject to the provisions of the Agreement feels he or she is aggrieved by a violation of this Agreement, he or she, through his or her local union business representative or job steward, shall, within five (5) working days after the occurrence of the violation, give notice to the work-site representative of the involved Contractor stating the provision(s) alleged to have been violated. The business representative of the local union or the job steward and the work-site representative of the involved Contractor and the Project Contractor shall meet and endeavor to adjust the matter within three (3) working days after timely notice has been given. The representative of the Contractor shall keep the meeting minutes and shall respond to the Union representative in writing (copying the Project Contractor) at the conclusion of the meeting but not later than twenty-four (24) hours thereafter. If they fail to resolve the matter within the prescribed period, the grieving party may, within forty-eight (48) hours thereafter, pursue Step 2 of the Grievance Procedure, provided the grievance is reduced to writing, setting forth the relevant information concerning the alleged grievance, including a short description thereof, the date on which the grievance occurred, and the provision(s) of the Agreement alleged to have been violated.

Step 1: (b) Should the Local Union(s) or the Project Contractor or any Contractor have a dispute with the other party and, if after conferring, a settlement is not reached within three (3) working days, the dispute may be reduced to writing and proceed to Step 2 in the same manner as outlined herein for the adjustment of an employee complaint.

Step 2: (a) The International Union Representative and the involved Contractor shall meet within seven (7) working days of the referral of a dispute to this second step to arrive at a satisfactory settlement thereof. Meeting minutes shall be kept by the Contractor. If the parties fail to reach an

agreement, the dispute may be appealed in writing in accordance with the provisions of Step 3 within seven (7) calendar days thereafter.

Step 3: (a) If the grievance has been submitted but not adjusted under Step 2, either party may request in writing, within seven (7) calendar days thereafter, that the grievance be submitted to an Arbitrator mutually agreed upon by them. The Contractor and the involved Union shall attempt mutually to select an Arbitrator, but if they are unable to do so, they shall request the American Arbitration Association to provide them with a list of arbitrators from which the Arbitrator shall be selected. The rules of the American Arbitration Association shall govern the conduct of the arbitration hearing. The decision of the Arbitrator shall be final and binding on all parties, the fee and expenses of the arbitrator shall be borne equally between the Contractor and the involved Local Union(s).

Step 3: (b) Failure of the grieving party to adhere to the time limits established herein shall render the grievance null and void. The time limits established herein may be extended only by written consent of the parties involved at the particular step where the extension is agreed upon. The Arbitrator shall have the authority to make decisions only on issues presented to him or her, and he or she shall not have the authority to change, amend, add to or detract from any of the provisions of this Agreement.

12.4 The Project Contractor and County shall be notified of all actions at Steps 2 and 3 and shall, upon their request, be permitted to participate in all proceedings at these steps.

Article 13 - Jurisdictional Disputes

13.1 As used in this Agreement, the term "jurisdictional dispute" shall be defined as any dispute, difference or disagreement involving the assignment of particular work to one class or craft of employees rather than to a different class or craft of employees, regardless of that Contractor's contractual relationship to any other employer, contractor or organization on the site.

13.2 It is agreed by and between the parties to this Agreement that any and all jurisdictional disputes shall be resolved in the following manner; each of the steps hereinafter listed shall be initiated by the parties in sequence as set forth:

(a) Negotiation by and between the Local Business Representative of the disputing Unions and Contractor assigning the work within 5 business days. Such negotiation shall be pursued until it is apparent that the dispute cannot be resolved at the local level.

(b) The International Representatives of the disputing Union shall meet on the job site by phone conference, e-mail or fax and attempt to resolve said dispute within 5 business days.

(c) The parties to the Jurisdictional Dispute shall submit the dispute directly to an agreed upon arbitrator after complying with paragraph 13.2(b) above within 5 business days. An arbitrator will be selected from a panel of seven (7) arbitrators supplied through the Federal Mediation and Conciliation Service being selected or rejected one at-a-time by the Unions involved. The arbitrator's decision will be final and legally binding on this project only. Further, the losing party(s) will be responsible for the cost of the Arbitrator.

(d) A jurisdictional dispute may be submitted upon a pre-job assignment.

(e) If any party to the jurisdictional dispute does not fully comply with the steps and time limit with each step, then the party in non-compliance will lose by "automatic default".

(f) Time limits at any step can be extended if all parties to the jurisdiction mutually agree in writing.

(g) All parties to a jurisdictional dispute can mutually agree to waive the time limits in steps 13.2(a) & 13.2(b) and proceed directly to an expedited arbitration hearing.

13.3 The signatory parties to this Agreement agree that all jurisdictional disputes shall be resolved without the occurrence of any strike, work stoppage or slow-down of any nature, and the Contractor's assignment shall be adhered to until the dispute is resolved. Individuals violating this section shall be subject to immediate discharge.

Article 14 – Workforce Diversity & Equal Opportunity in Employment

14.1 It is the policy of Champaign County to encourage and require equal opportunity in employment for all persons, and to promote the full realization of equal employment opportunity through actions by contracting entities who contract with the County. This Article establishes standards and procedures by which Contractors and Unions who perform work on County projects may comply with this stated equal employment opportunity policy.

14.2 Neither the Contractor nor the Union shall discriminate against any employee on the basis of race, color, religion, national origin, ancestry, sex (including pregnancy), gender identity or expression, age, citizenship status, marital status, sexual orientation, genetic information, order of protection status, arrest record, military status, physical or mental disability unrelated to an individual's ability to perform the essential functions of their job with or without reasonable accommodations, or unfavorable discharge from the military.

14.3 Neither the Contractor nor the Union shall retaliate against a person because they complained about discrimination, filed a charge of discrimination, or participated in an employment discrimination investigation or lawsuit.

14.4 *Definitions.* The following words, terms and phrases, when used in this Article, shall have the meanings ascribed to them in this Article, except where the context clearly indicates a different meaning:

(a) *Champaign Diversity Advancement Program vendor list (CDAP vendor list)* means the certified database maintained by the City of Champaign, used by the County of Champaign pursuant to intergovernmental agreement, of qualified contracting entities that are 51 percent owned and operated by females, minorities, or individuals in other socially disadvantaged groups; or which are local, economically disadvantaged businesses.

(b) *Construction contract* means any contract to which the County is a party for the construction, rehabilitation, alteration, conversion, demolition or repair of buildings, highways or other improvements to real property.

(c) *Construction contractor* means any person who contracts with the County in a construction contract.

(d) *Construction subcontractor* means any person who contracts with a construction contractor in an amount greater than Thirty Thousand Dollars (\$30,000.00) for any single construction contract.

(e) *Contracting entity* means any vendor, construction contractor, or construction subcontractor.

(f) *Good faith efforts* are documented actions taken or planned by a contracting entity that are reasonably calculated to meet an established utilization or workforce participation goal or to encourage employment of, partnership with, and development of MBEs, WBEs and female and minority individuals in County projects. A contracting entity making good faith efforts actively and aggressively seeks participation by and partnership with WBEs, MBEs, and women and minority

workers. The County will consider the quality, quantity, and consistency of efforts made by a contracting entity in determining whether the contracting entity has acted in good faith.

(g) *Minority Business Enterprise (MBE)* means a business that is at least 51 percent owned by one or more minority persons, or in the case of a corporation, at least 51 percent of the stock in which is owned by one or more than one minority persons; and the management and daily business operations of which are controlled by one or more of the minority individuals who own the business. A business certified as an MBE pursuant to the Champaign Diversity Advancement Program as indicated on the current CDAP vendor list shall be considered an MBE for purposes of this Agreement for such time as said certification remains valid.

(h) *Minority*. For purposes of this Article, "minority" shall be defined by reference to the definition of "minority person" in the Illinois Business Enterprise for Minorities, Females, and Persons with Disabilities Act, 30 ILCS 575/2, as amended.

(i) *Vendor* means persons who sell goods or services to the County in non-construction contracts and any financial depository in which the County deposits funds.

(j) *Woman Business Enterprise (WBE)* means a business that is at least 51 percent owned by one or more women, or, in the case of a corporation, at least 51 percent of the stock in which is owned by one or more women; and the management and daily business operations of which are controlled by one or more of the women who own the business. A business certified as a WBE pursuant to the Champaign Diversity Advancement Program as indicated on the current CDAP vendor list shall be considered a WBE for purposes of this Agreement for such time as said certification remains valid.

14.5 *Good faith efforts.*

(a) All contracting entities performing work on this Project are required to demonstrate good faith efforts in order to be considered a responsive bidder or respondent and throughout the duration of this Project to meet the County's established goals for utilization and employment of MBE and WBE firms and minority and female workers. The County Executive or his or her designee will determine the sufficiency of a contracting entity's good faith efforts. Sufficiency of good faith efforts may vary depending on the type of project, the type of products and/or services to be provided, and the duration of the project.

(b) *Female and Minority Participation Goals.* The County will set aspirational contract participation goals for this Project, except as exempted or waived pursuant to this Article, to assist in inclusion efforts of racial and ethnic minorities, women, and MBEs and WBEs. Contracting entities may meet contract participation goals in two ways: by employing set percentages of female and minority employees ("workforce participation goals"), and/or by assigning set percentages of work on a project to MBEs and WBEs ("utilization goals"). The County will ensure that female and minority participation goals are narrowly tailored in accordance with applicable law, and the County will provide appropriate flexibility to businesses in establishing and providing opportunities for female and minority workers. The County Executive will establish and report goals to the County Board as soon as reasonably practicable upon commencement of the Project, or prior thereto if feasible.

(c) The Union shall make all reasonable efforts to encourage, facilitate, and cooperate with a contracting entity in meeting the County's workforce participation and utilization goals and demonstrating good faith efforts.

(d) The following are minimum requirements a contracting entity must meet to demonstrate good faith efforts:

- (1) All contracting entities must submit an Affirmative Action plan as outlined in Article 14.6.
 - (2) All contracting entities must make all reasonable efforts to contact, negotiate, and partner in good faith with qualified MBE and WBE firms listed on the CDAP vendor list for potential subcontracting and/or joint venture opportunities and to employ female and minority employees.
 - (3) All contracting entities must submit a utilization plan that outlines their planned use of qualified MBE and WBE firms as subcontractors or as part of a joint venture, if applicable, and their employment of female and minority employees.
- (e) Other evidence of good faith efforts by contracting entities may include, but is not limited to:
- (1) Providing job training or direct employment opportunities to increase the utilization of women and minorities on County projects.
 - (2) Attendance at County-sponsored networking events to increase the utilization of MBEs, WBEs, and female and minority workers.
 - (3) Providing evidence that the contracting entity has met or exceeded the goals established for this County project related to the utilization of MBE and WBE firms and minority and female workers. Evidence may include payroll records or other documents showing the percentage of minority or female workers employed on a project or the percentage of project hours completed by minority and female workers.
 - (4) Monetary contributions to training and development funds or organizations dedicated to encouraging MBE and WBE businesses and minority and female workers.
 - (5) Outreach and recruitment efforts of WBEs and MBEs and female and minority workers.
 - (6) Packaging requirements, where feasible, into tasks and quantities that encourage maximum participation from MBEs, WBEs, and minority and female workers.
 - (7) Providing interested and qualified MBEs and WBEs with adequate information about the bidding and request for proposal process, adequate time to respond, and assistance in responding to bid and proposal solicitation.
 - (8) Assisting interested MBEs and WBEs in obtaining necessary equipment, supplies, and materials to successfully compete for County contracts and subcontracts.
 - (9) Assisting interested MBEs and WBEs in obtaining bonding, lines of credit, or insurance.
 - (10) Seeking services from available female and minority community organizations, minority and female contractors' groups, minority and female business assistance offices, and other organizations as appropriate, to provide assistance in recruiting MBEs, WBEs, and minority and female workers.

(11) If a contracting entity has rejected one or more MBEs or WBEs for a subcontracting or joint venture opportunity, providing supportable reasons for rejection based on a thorough investigation of the business and its qualifications.

(12) All other evidence of good faith efforts that the County Executive or his or her designee deems sufficient to advance the County's goals to encourage minority and female participation in County projects.

(f) *Waiver.*

(1) Contracting entities that are unable to achieve utilization and workforce participation goals established for County projects may request a waiver from the County Executive or his or her designee. Waivers will only be granted when all reasonable attempts at good faith efforts have been exhausted.

(2) Good faith effort requirements may be waived on certain County projects due to the inability to appropriately apply the requirements in this section as a result of the nature of the contract or project.

(3) A waiver may be granted at the initiation of a purchase, at the vendor selection phase, or at any time during the term of the project.

(4) The determination to grant or deny a waiver and the duration of the waiver will be at the sole discretion of the County Executive or his or her designee.

(5) A contracting entity that demonstrates unwillingness to make good faith efforts, or that has demonstrated unwillingness to comply with good faith efforts in past County projects, will not be eligible for a waiver.

(g) *Compliance.*

(1) If the County Executive or his or her designee determines that a contracting entity has not made recent and substantial good faith efforts during the term of a County project, and the contracting entity does not have a valid waiver, the County Executive or his or her designee will notify the contracting entity of its non-compliance in writing. The notice will detail the non-compliance and will include information regarding the actions the contracting entity must take to cure the non-compliance.

(2) The contracting entity will be given ten (10) business days to cure the non-compliance or to provide a response in writing to the County Executive or his or her designee making acceptable arrangements to cure the non-compliance. Acceptable arrangements may include a waiver where the County Executive or his or her designee deems appropriate.

(3) If the contracting entity fails to cure the non-compliance or to make acceptable arrangements to cure the non-compliance within ten (10) business days, or if the County Executive or his or her designee finds the contracting entity's response insufficient, the County Executive or his or her designee may:

- a. Cancel, terminate, or suspend the contract in whole or in part;
- b. Declare the contracting entity ineligible for further contracts for up to one calendar year;

c. Require the contracting entity to pay liquidated damages in the amount of fifty dollars (\$50.00) per day for each day the contracting entity was in non-compliance beginning with the original date of the letter of non-compliance; and/or

d. Pursue other contractual remedies or sanctions allowable by law.

14.6 Affirmative action plan; submittal and approval.

(a) *Submittal.* Each contracting entity, as defined herein, shall submit an affirmative action plan and a utilization plan for the County's consideration describing the actions the entity will take to ensure compliance with this article. Affirmative action plans shall be accepted for a period of one (1) year from the date of approval by the County. Utilization plans must be submitted for each contract unless otherwise determined by the County Executive or his or her designee.

(b) *Minimum requirements.* The plan shall be approved by the County Executive or his or her designee if, and only if, the plan at minimum reflects substantial compliance with the following requirements:

(1) *Equal employment policy statement.* The contracting entity must indicate a positive attitude toward equal employment opportunity and indicate that decisions regarding recruitment, hiring, training and promotion will be made without regard to race, color, religion, national origin, ancestry, sex (including pregnancy), gender identity or expression, age, citizenship status, marital status, sexual orientation, genetic information, order of protection status, arrest record, military status, physical or mental disability unrelated to an individual's ability to perform the essential functions of their job with or without reasonable accommodations, or unfavorable discharge from the military, except when one (1) of these criterion is a good faith qualification for the occupation involved.

(2) *Assignment of responsibility.* The contracting entity must select a director of the contracting entity's affirmative action program. It will be the director's responsibility, among other things, to assist in the identification and solution of problems. The contracting entity must give the director the necessary top management support and staffing to fulfill his or her job duties.

(3) *Procedures for disseminating policy.* A policy of affirmative action is considered to be of little value unless it goes beyond the words on a piece of paper and is put into effect. The contracting entity is responsible for establishing procedures for disseminating their affirmative action program both within the entity (internally) and outside the entity (externally).

(4) *Utilization analysis.* The contracting entity must identify those areas within the contracting entity's workforce in which minorities and women are being under-utilized. A utilization analysis is composed of four (4) different parts: a workforce analysis; identification of job groups within the contracting entity; an availability analysis; and an under-utilization analysis.

(5) *Goals and timetables.* For each job group in which under-utilization of minorities or women is found, the contracting entity must set up a system of goals and timetables for correcting the deficiencies. Separate goals for minorities and women must be established, but a single goal for minorities is acceptable unless it is determined that one (1) minority is underutilized in a substantially disparate manner.

(6) *Identification of problem areas and adverse effect.* The contracting entity must identify key job titles in which women or minorities are under-represented in relation to their availability in the workforce and those employment practices which have an adverse effect on women or minorities so as to discourage their employment or full utilization. The contracting entity studies of applicant flow, recruitment procedures, selection and placement procedures, promotions and transfers, seniority systems, terminations, relations with labor unions, employee benefits and working conditions are required.

(7) *Corrective action measures.* Should problem areas be identified or a disproportionate impact on women or minorities be uncovered, the contracting entity is obligated to develop and execute corrective action programs. The total selection process should be evaluated and the necessary changes made.

(8) *System for monitoring compliance.* To ensure that the non-discrimination policy is being carried out, the contracting entity should monitor employment actions at all levels and require the submission for review of reports from unit managers on a scheduled basis.

(9) *Support of EEO programs.* The contracting entity must actively support local, state, and national programs that are designed to improve the employment opportunities of women and minorities.

(10) *Recruitment of persons outside workforce.* Racial minorities and women generally considered outside of the workforce should be considered for employment when they have the requisite skills and can be recruited through good faith efforts.

(11) *System of records and annual summary.* In order to be able to supply compliance officers with information on affirmative action efforts, contracting entities should establish a system of compiling support data in such forms as applicant flow data, progression line charts, seniority rosters, and applicant rejection ratios indicating minority and sex status.

(c) *Failure to submit plan.* If the proposed contracting entity fails to submit an affirmative action plan and utilization plan which, in the County Executive's sole discretion, comply with this section, prior to the execution of a contract by the County, or within such reasonable time after execution as may be provided by the County Executive, the sanctions provided for in this article or provided for in the agreement shall be enforced against the contracting entity.

(d) *Failure to cooperate or comply with plan.* If the contracting entity fails to provide information required to the County Executive to determine compliance with the plan within ten (10) business days of any such request, or fails to make a good faith effort to comply with the provisions of the submitted and approved affirmative action plan, or utilization plan the County Executive may invoke any of the sanctions provided for under the terms of the agreement with the contracting entity.

Article 15 - General Savings Clause

15.1 If any Article or provision of this Agreement shall be declared invalid, inoperative or unenforceable by any competent authority of the executive, legislative, judicial or administrative branch of the Federal or State government, the Contractor and the Union shall suspend the operation of such Article and provisions during the period of its invalidity and shall substitute by mutual consent, in its place and stead, an Article or provision which will meet the objections to its validity and which will be in accord with the intent and purpose of the Article or provision in question.

Article 16 - Term of Agreement

16.1 This Agreement shall be in full force as of and from the date shown above to and including the end of all construction by the Contractor.

(Remainder of page intentionally left blank.)

PROJECT NAME AND CONTRACTOR SIGNATURE PAGE

Project Name **Photovoltaic System Installation Project** _____

IN WITNESS WHEREOF, the ECIBCTC and CONTRACTOR have executed this Project Labor Agreement on this _____ day of _____, 2026.

CONTRACTOR

East Central Illinois Building & Construction Trades Council (ECIBCTC)

Contractor Signature

ECIBCTC President by resolution and authority of the signatory trade unions of the Project Labor Agreement

Print Name

- Boilermakers LU #60
- Bricklayers LU #8
- Carpenters LU #243
- Electrical Workers LU #601
- Elevators LU #55
- Glaziers LU# 1168
- Heat and Frost Insulators LU #18
- Ironworkers LU #380
- Laborers LU #703
- Laborers LU #751
- Millwrights LU #1051
- Operating Engineers LU #84I
- Painters LU #363
- Plasterers & Cement Masons LU #143
- Plumbers & Steamfitters LU #149
- Road Sprinklers LU #669
- Roofers LU #97
- Sheet Metal LU #218
- Teamsters LU #26

Title

Company Name

Address

City, State, Zip Code

Phone

Fax

Email

Website

SIGNATURE PAGE(S) FOR THE UNIONS

(to be supplied by Union)

PARTICIPATION AGREEMENT

The undersigned Project Contractor, Contractor or subcontractor, subcontracting to
_____ agrees to be bound to the
attached Project Labor Agreement negotiated between
_____ and the East Central Illinois Building & Construction
Trades Counsel (ECIBCTC).

Project Contractor, Contractor, Subcontractor

By

Date

UNION CONTACT LIST

(to be supplied by Union)

PART 1 - GENERAL

1.1 PROJECT INFORMATION

A. Project Identification: Photovoltaic System Installation

1. Project Location:

Champaign County Pope Jail and Juvenile Detention Center
502 South Lierman Avenue and 400 Art Bartell Road
Urbana, Illinois 61802

B. Owner: County of Champaign

C. Design Team: GHR Engineers and Associates, Inc.

D. Project consists of the following:

1. Install an approximate 125kW solar photovoltaic (PV) system at the Champaign County Juvenile Detention Center.
2. Install an approximate 500kW solar photovoltaic (PV) system at the Champaign County Pope Jail.

1.2 WORK RESTRICTIONS

A. Contractor's Use of Premises: During construction, Contractor will have limited use of site and building indicated. Contractor's use of premises is limited only by Owner's right to perform work or employ other contractors on portions of Project and as follows:

1. Owner will occupy premises during construction. Perform construction between 6 AM to 5 PM Monday thru Friday, other than holidays, unless otherwise agreed to in advance by Owner. Clean up work areas and return to usable condition at the end of each work period.
2. Limits: Limit site disturbance.
3. Driveways, Walkways, and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

B. On-Site Work Hours: Limit work in the existing buildings to the hours of 6 AM to 5 PM, Monday through Friday, unless otherwise indicated.

1. Weekend Hours: As permitted by Owner. Coordinate with Owner.
2. Early Morning Hours: 6 AM or as permitted by Owner. Coordinate with Owner.

C. Nonsmoking Building: Smoking is not permitted within the building or on the project site.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 1000

PART 1 - GENERAL

1.1 PAYMENT PROCEDURES

- A. Submit a Schedule of Values at least seven (7) days before the initial Application for Payment. Break down the Contract Sum into at least one line item for each Specification Section in the Project Manual table of contents. Coordinate the schedule of values with Contractor's construction schedule.
1. Arrange schedule of values consistent with format of AIA Document G703.
 2. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
 3. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 4. Provide separate line items in the schedule of values for initial cost of materials and for total installed value of that part of the Work.
 5. Provide a separate line item in the schedule of values for each allowance.
- B. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 forms for Applications for Payment.
1. Anticipated Application for Payment Schedule:
 - a. Contractor shall be permitted to bill monthly provided ample evidence of off-site work.
 - b. Final Payment: Upon completion of punch list, receipt of all close-out documents and completion of owner training.
- C. Submit **three (3)** copies of each application for payment according to the schedule established in Owner/Contractor Agreement.
1. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor.
 2. With each Application for Payment, Contractor shall include the Contractor's waiver of lien for the full amount and partial waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
 3. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 - a. Include insurance certificates, proof that taxes, fees, and similar obligations were paid, and evidence that claims have been settled.
 - b. Include affidavit of payment of debts and claims on AIA Document G706.
 - c. Include affidavit of release of liens on AIA Document G706A.
 - d. Include consent of surety to final payment on AIA Document G707.
 4. Certified Payroll Statements: The Contractor shall submit Certified Payroll Statements pursuant to Illinois Law-Public Act 94-0515 with each payment application. The Certified Transcript of Payroll statement forms are available through the Illinois Department of Labor website: <http://www.state.il.us/agency/idol/forms/pdfs/IL452CM02.pdf>. Certified payroll statements are required from the Contractor and each Subcontractor. The statements are to include the time period of the payment application. Payment Applications will not be processed without accompanying Certified Payroll Statements.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 2000

PART 1 - GENERAL

1.1 SUBSTITUTION PROCEDURES

- A. Substitutions include changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- B. Substitution Requests: Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles. Substitutions will NOT be considered after bidding.
1. Substitution Request Form: Use facsimile of form provided in the Project Manual.
 2. Submit requests by noon on April 27, 2026.
 3. Identify product to be replaced and show compliance with requirements for substitutions. **Include a detailed comparison of significant qualities of proposed substitution with those of the Work specified**, a list of changes needed to other parts of the Work required to accommodate proposed substitution, and any proposed changes in the Contract Sum or the Contract Time should the substitution be accepted.
 4. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. **Indicate deviations, if any, from the Work specified.**
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested:
 - 1) All samples shall be clearly labeled with product information and Vendor contact information.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of engineers and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.

- I. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
- C. Engineer will review proposed substitutions and notify Contractor of their acceptance or rejection via Addendum. If necessary, Engineer will request additional information or documentation for evaluation.
 - 1. Use product specified if Engineer does not issue a decision on use of a proposed substitution within time allocated.
- D. Do not submit unapproved substitutions on Shop Drawings or other submittals.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 2500

SUBSTITUTION REQUEST FORM

Project: Photovoltaic System Installation
 Champaign County Pope Jail and Juvenile Detention
 Center

Request No.:

Date:

Location (provide room number(s):

Name of Material, Product or Equipment item specified:

Name of Material, Product or Equipment item submitted as substitution:

Specification Section:

Qualities that differ from specified product or system:

Name of Manufacturer / Fabricator:

Address

City, State and Zip

Phone:

Name of Vendor / Supplier Requesting Change	Address	Contact Name	Phone:

Reason for requesting substitution request:

Substitution affects other materials or systems, such as dimensional revisions, redesign of structure or modifications to other work:

NO
 YES; describe requirements:

If substitution requires modifications to dimensions indicated on drawings, are such modifications clearly indicated on attached data?

YES
 NO; if NO, explain:

Substitution has an affect on Construction Schedule:

NO
 YES; describe affect on schedule:

Savings or Credit to Contract Amount for accepting substitute:

_____ Dollars (\$_____).

Note: Show bid amount in both words and figures.

The attached data is furnished herewith for evaluation of the substitution:

_____ Product Data _____ Drawings _____ Samples _____ Tests _____ Reports

_____ Other Information; describe:

The undersigned hereby certifies:

1. The proposed substitution has been fully investigated and is equal or superior to specified product.
2. The same or better warranty will be furnished for proposed substitution as for specified material, product or equipment.
3. All changes in the work resulting from the use of this substitution, if approved, will be coordinated and completed in all respects and all costs, including, but not limited to, those for additional services rendered by the Owner are the responsibility for this Contractor at no additional cost to the Contract.

Contractor

Signed by

Address

City, State and Zip

END OF SUBSTITUTION FORM 01 2500a

PART 1 - GENERAL

1.1 CONTRACT MODIFICATION PROCEDURES

- A. Design Team will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.
- B. Owner-Initiated Proposal Requests: Design Team will issue a detailed description of proposed changes in the Work.
 - 1. Proposal Requests are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request or 20 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time.
- C. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Design Team.
- D. On Owner's approval of a Proposal Request, Design Team will issue a Change Order for signatures of Owner and Contractor, for all changes to the Contract Sum or the Contract Time.
- E. Design Team may issue a Construction Change Directive. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- F. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 2600

PART 1 - GENERAL

1.1 PROJECT MANAGEMENT AND COORDINATION

- A. Subcontract List: Submit a written summary identifying individuals or firms proposed for each portion of the Work.
- B. Key Personnel Names: Within ten (10) days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. List e-mail addresses and telephone numbers.
- C. Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work.
- D. Request for Information (RFIs): On discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI. Use forms acceptable to Design Team and Owner.
- E. Schedule and conduct (2) progress meetings at Project site, coordinated with the Design Team and Owner. Notify Owner of meeting dates and times. Require attendance of each subcontractor or other entity concerned with current progress or involved in planning, coordination, or performance of future activities.

1.2 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 1. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 2. Submit two copies of each action submittal. Design Team will return one copy.
 - 3. Submit one copy of each informational submittal. Design Team will not return copies.
 - 4. Design Team will discard submittals received from sources other than Contractor.
- B. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
 - 1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 - 2. Name file with unique identifier, including project identifier, Specification Section number, and revision identifier.
 - 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Design Team.
- C. Identify options requiring selection by Design Team.
- D. Identify deviations from the Contract Documents on submittals.
- E. Contractor's Construction Schedule Submittal Procedure:
 - 1. Submit required submittals in the following format:
 - a. PDF electronic file.

2. Coordinate Contractor's construction schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections.
 1. Submit electronic submittals via email as PDF electronic files to Shannon Hicks at GHR Engineers and Associates, Inc.: shicks@ghrinc.com.
 - a. Design Team will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

2.2 ACTION SUBMITTALS

- A. Submit two paper copies of each submittal unless otherwise indicated. Design Team will return one copy.
- B. Product Data: Mark each copy to show applicable products and options. Include the following:
 1. Manufacturer's written recommendations, product specifications, and installation instructions.
 2. Wiring diagrams showing factory-installed wiring.
 3. Printed performance curves and operational range diagrams.
 4. Testing by recognized testing agency.
 5. Compliance with specified standards and requirements.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data. Submit on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches. Include the following:
 1. Dimensions and identification of products.
 2. Fabrication and installation drawings and roughing-in and setting diagrams.
 3. Wiring diagrams showing field-installed wiring.
 4. Notation of coordination requirements.
 5. Notation of dimensions established by field measurement.

2.3 INFORMATIONAL SUBMITTALS

- A. Informational Submittals: Submit one paper copy of each submittal unless otherwise indicated. Design Team will not return copies.
- B. Qualification Data: Include lists of completed projects with project names and addresses, names and addresses of Design Team and owners, and other information specified.
- C. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

PART 3 - EXECUTION

3.1 SUBMITTAL REVIEW

- A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Design Team.
- B. Design Team will review each action submittal, make marks to indicate corrections or modifications required, will stamp each submittal with an action stamp, and will mark stamp appropriately to indicate action.
- C. Informational Submittals: Design Team will review each submittal and will not return it, or will return it if it does not comply with requirements. Design Team will forward each submittal to appropriate party.
- D. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 01 3000

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
- B. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements, comply with the most stringent requirement. Refer uncertainties to Design Team for a decision.
- C. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum. The actual installation may exceed the minimum within reasonable limits. Indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Design Team for a decision.
- D. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 - 12. Name and signature of laboratory inspector.
 - 13. Recommendations on retesting and reinspecting.
- E. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, notices, receipts for fee payments, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.
- F. Testing Agency Qualifications: An independent agency with the experience and capability to conduct testing and inspecting indicated; and where required by authorities having jurisdiction, that is acceptable to authorities.
- G. Retesting / Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced work that failed to comply with the Contract Documents.
- H. Testing Agency Responsibilities: Cooperate with Design Team and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Design Team and Contractor of irregularities or deficiencies in the work observed during performance of its services.
 - 2. Do not release, revoke, alter or increase requirements of the Contract Documents or approve or accept any portion of the work.

3. Do not perform any duties of Contractor.
- I. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- J. Tests and Inspections: Owner will engage a qualified inspector to conduct inspections required by authorities having jurisdiction.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.
- B. Contractor will maintain a safe work site at all times. When the project is complete, Contractor shall return the work site and the surrounding areas to the same condition as they were prior to the beginning of the project.

END OF SECTION 01 4000

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
- B. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced.
 - 1. Show compliance with requirements for comparable product requests.
 - 2. Design Team will review the proposed product and notify Contractor of its acceptance or rejection.
- C. Basis-of-Design Product Specification Submittal: Show compliance with requirements.
- D. Compatibility of Options: If Contractor is given option of selecting between two or more products, select product compatible with products previously selected.
- E. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Deliver products to Project site in manufacturer's original sealed container or packaging, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 3. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
 - 4. Store materials in a manner that will not endanger Project structure.
 - 5. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
- F. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. Provide products that comply with the Contract Documents, are undamaged, and, unless otherwise indicated, are new at the time of installation.
 - 1. Provide products complete with accessories, trim, finish, and other devices and components needed for a complete installation and the intended use and effect.
 - 2. Where products are accompanied by the term "as selected," Owner will make selection.
 - 3. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
- B. Where the following headings are used to list products or manufacturers, the Contractor's options for product selection are as follows:

1. Products:
 - a. Where requirements include "one of the following," provide one of the products listed that complies with requirements.
 - b. Where requirements do not include "one of the following," provide one of the products listed that complies with requirements or a comparable product.
2. Manufacturers:
 - a. Where requirements include "one of the following," provide a product that complies with requirements by one of the listed manufacturers.
 - b. Where requirements do not include "one of the following," provide a product that complies with requirements by one of the listed manufacturers or another manufacturer.
3. Basis-of-Design Product: Provide the product named, or indicated on the Drawings, or a comparable product by one of the listed manufacturers.

2.2 COMPARABLE PRODUCTS

- A. Design Team will consider Contractor's request for comparable product in advance of Bidding only when the following conditions are satisfied:
 1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications.
 3. List of similar installations for completed projects, if requested.
 4. Samples, where applicable.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 6000

PART 1 - GENERAL

1.1 EXECUTION REQUIREMENTS

A. Cutting and Patching:

1. Structural Elements: When cutting and patching structural elements, notify Design Team of locations and details of cutting and await directions from Engineer before proceeding. Shore, brace, and support structural elements during cutting and patching.
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
3. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Engineer's opinion, reduce the building's aesthetic qualities.

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

1.2 CLOSEOUT SUBMITTALS

A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

B. Certified List of Incomplete Items: Final submittal at Final Completion.

C. Operation and Maintenance Data: Submit two (2) copies of manual.

D. PDF Electronic File: Assemble manual into a composite electronically indexed file. Submit two (2) copies on digital media.

E. Record Product Data: Submit two (2) paper copies and annotated PDF electronic files and directories of each submittal.

1.3 SUBSTANTIAL COMPLETION PROCEDURES

A. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.

B. Submittals Prior to Substantial Completion: Before requesting Substantial Completion inspection, complete the following:

1. Submit closeout submittals specified in other sections, including project record documents, operation and maintenance manuals, similar final record information, warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
2. Submit maintenance material submittals specified in other sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Owner.
3. Submit test/adjust/balance records.

C. Procedures Prior to Substantial Completion: Before requesting Substantial Completion inspection, complete the following:

1. Complete startup and testing of systems and equipment.
2. Perform preventive maintenance on equipment used prior to Substantial Completion.
3. Remove temporary facilities and controls.

4. Complete final cleaning requirements, including touchup painting.
 5. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Engineer will proceed with inspection or advise Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will advise Contractor of items that must be completed or corrected before certificate will be issued.

1.4 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Within (2) weeks of receipt of punch list, complete the following:
1. Submit a final Application for Payment.
 2. Submit certified copy of Design Team's Substantial Completion inspection list of items to be completed or corrected (punch list). Certified copy of the list shall state that each item has been completed or otherwise resolved.
- B. Submit a written request for final inspection for acceptance. On receipt of request, Design Team will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare final Certificate for Payment after inspection or will advise Contractor of items that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
- B. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

2.2 OPERATION AND MAINTENANCE DOCUMENTATION

- A. Directory: Prepare a single, comprehensive directory of operation and maintenance data and materials, listing items and their location to facilitate ready access to desired information.
- B. Organization: Unless otherwise indicated, organize manual into separate sections for each system and subsystem, and separate sections for each piece of equipment not part of a system.
1. Dividers: Provide heavy paper dividers with celluloid-covered tabs for each separate Section. Mark each tab to indicate contents. Provide a typed description of the product and major parts of equipment included in the Section on each divider.

- C. Organize data into three-ring binders with identification on front and spine of each binder, and envelopes for folded drawings. Identify each binder on the front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL", Project title or name, year and subject matter covered. Indicate volume number for multiple volume sets of manuals. Include the following:
 - 1. Manufacturer's operation and maintenance documentation.
 - 2. Maintenance and service schedules.
 - 3. Maintenance service contracts. Include name and telephone number of service agent.
 - 4. Emergency instructions.
 - 5. Spare parts list and local sources of maintenance materials.
 - 6. Wiring diagrams.
 - 7. Copies of warranties. Include procedures to follow and required notifications for warranty claims.

2.3 RECORD DRAWINGS

- A. Record Prints: Maintain a set of prints of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued. Mark to show actual installation where installation varies from that shown originally. Accurately record information in an acceptable drawing technique.
 - 1. Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Engineer. When authorized, prepare a full set of corrected digital data files of the Contract Drawings.
 - 1. Format: Annotated PDF electronic file.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. Verify compatibility with and suitability of substrates.
 - 2. Examine roughing-in for mechanical and electrical systems.
 - 3. Examine walls, floors, and roofs for suitable conditions.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Take field measurements as required to fit the Work properly. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication.
- D. Verify space requirements and dimensions of items shown diagrammatically on Drawings.

3.2 CONSTRUCTION LAYOUT

- A. Before proceeding to lay out the Work, verify layout information shown on Drawings.

3.3 INSTALLATION

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Conceal wiring in finished areas unless otherwise indicated.
 - 3. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations.
- C. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- D. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed.
- E. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Owner.
- F. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- G. Use products, cleaners, and installation materials that are not considered hazardous.

3.4 CUTTING AND PATCHING

- A. Provide temporary support of work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- D. Cutting: Cut in-place construction using methods least likely to damage elements retained or adjoining construction.
 - 1. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
- E. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
 - 1. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - 2. Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance.
 - 3. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint

coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

3.5 CLEANING

- A. Clean Project site and work areas daily, including common areas. Dispose of materials lawfully.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
 - 3. Remove debris from concealed spaces before enclosing the space.
 - 4. Quality of onsite cleaning shall be an agenda item for all weekly construction meetings.
- B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion:
 - 1. Clean Project site and grounds, in areas disturbed by construction activities. Sweep paved areas; remove stains, spills, and foreign deposits. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - 2. Sweep paved areas broom clean. Remove spills, stains, and other foreign deposits.
 - 3. Remove labels that are not permanent.
 - 4. Clean transparent materials, including mirrors. Remove excess glazing compounds.
 - 5. Clean exposed finishes to a dust-free condition, free of stains, films, and foreign substances. Sweep concrete floors broom clean.
 - 6. Vacuum carpeted surfaces.
 - 7. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and foreign substances. Clean plumbing fixtures. Clean light fixtures, lamps, globes, and reflectors.

3.6 OPERATION AND MAINTENANCE PREPARATION

- A. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- B. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are unavailable and where the information is necessary for proper operation and maintenance of equipment or systems.
- C. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams.

END OF SECTION 01 7000

PART 1 - GENERAL (Not Used)

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - 1. Review locations established for recycling and disposal.

3.2 RECYCLING WASTE

- A. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.
 - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:
 - 1. Sort and stack reusable members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
 - 2. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - 3. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
- C. Metals: Separate metals by type.

3.3 DISPOSAL OF WASTE

- A. Except for items or materials to be recycled or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
- B. Recycle recyclable materials off-site.
- C. Do not burn waste materials.

END OF SECTION 01 7419

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid:

1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Electrical equipment coordination and installation.
- 2) Common electrical installation requirements.

PART 2 - PRODUCTS – DOES NOT APPLY

PART 3 - EXECUTION

3.1 INSPECTION OF BID DOCUMENTS AND PREMISES

- A. Visit the premises, take measurements and verify all elevations shown on the drawings, inspect existing conditions and limitations, obtain first hand information necessary to submit a complete bid.
- B. Thoroughly examine the complete set of contract documents including work required by other trades. Bidders are cautioned to acquaint themselves with requirements necessitating installation work of material or equipment furnished by other contractors or the Owner.
- C. In the event of any conflict, discrepancy or inconsistency among the Contract Documents, interpretation shall be based on the following descending order or priority:
1. Specifications.
 2. Drawings, and among the drawings, the following:
 - a. as between figures given on drawings and scaled measurements, the figures shall govern;
 - b. as between large scale drawings and small-scale drawings, the large-scale drawings shall govern.
 3. In the event that Work is called for by the drawings but not by the specifications, or by the specifications but not by the drawings, the Contractor shall be responsible for such Work.

3.2 COORDINATION

A. Coordinate arrangement, mounting, and support of electrical equipment:

1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
3. To allow right of way for piping and conduit installed at required slope.
4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

- B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

3.3 INTERRUPTION OF ELECTRICAL SYSTEMS AND SERVICES

- A. Do not interrupt electric systems or service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
 - 1. Notify Architect or Owner no fewer than seven days in advance of proposed interruption of electrical service. Indicate:
 - a. The extent of the work to be done during the outage.
 - b. Probable length of time required for the outage.
 - c. Designed time at which the outage is to begin.
 - 2. Do not proceed with interruption of electrical service without Architect's or Owner's written permission.
 - 3. Schedule work to minimize the number and length of time of the outage(s) or interruption(s) of the various systems and services.

3.4 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

- A. Comply with NECA 1.
- B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
- C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- E. Space Preference:
 - 1. Carefully verify and coordinate the location and level of all lines. Run preliminary levels and check with all other contractors so that conflict in location may be avoided.
- F. Lines and Levels: Determine all grades, maintain necessary lines and levels throughout the progress of the work and assume full responsibility for their correctness. Where levels are indicated on the drawings, work shall be installed at those levels unless prior written approval to change is obtained from the Architect / Engineer.
- G. Location of Equipment: The approximate location of all equipment is shown on the drawings. The Architect / Engineer reserves the right to change the location of all equipment 5' in any direction without these changes being made the subject of an extra charge provided such changes are made before final installation.

3.5 CUTTING AND PATCHING

- A. Examine drawings to determine the general nature of the types of construction to be encountered during performance of electrical work.
- B. All cutting and patching of masonry, carpentry, steel, iron work, concrete structural work, and finished surfaces belonging to the building shall be done in order that work may be properly

installed. Replace or repair all disturbed constructions or finishes to its original condition and under no condition cut structural work except upon approval of the Architect / Engineer.

- C. Cut through ceilings, floors, walls and partitions in a careful manner and fill the openings around the pipes and sleeves.
- D. Carefully coordinate locations of openings and sleeves to avoid conflict with other trades. Furnish complete information concerning locations and sizes of openings to other trades in sufficient time for inclusion on their shop drawings.
- E. Employ craftsmen and mechanics who are skilled and experienced in their respective trades to perform all cutting, fitting, matching, patch repairing, and finishing work required for installation of electrical work.
- F. Perform cutting to neat line, in a manner that will not weaken the wall, partition, or floor being cut. Cut holes in floors to neat line. Perform drilling in a manner that will not cause breaking of floor around the drilled hole.
- G. Patch, repair and unify all work and material that is cut.

3.6 OPENINGS IN EXISTING CONSTRUCTION

- A. In existing construction, perform all cutting and patching where required in connection with the work. Match patching to existing adjacent surfaces.
- B. All cutting in existing structural elements of building shall be accomplished with hole saws. Air hammers and cutting torches are not permitted.
- C. Reinforced concrete slabs, steel joists, concrete floors and footings, or other structural work shall not be cut or disturbed in any way, unless as approved by the Architect / Engineer. The Electrical Contractor shall be held responsible for and correct all damage that he may cause.

3.7 FIELD CORRECTIONS AND CHANGES

- A. Carefully and accurately record on field set of drawings, any deviations or changes in locations of conduit, wiring and/or equipment made in the field and shall keep the Architect / Engineer informed on all deviations and changes.
- B. At the completion of the job, furnish the Architect / Engineer three (3) complete sets (not the field set) of drawings indicating these deviations or changes. Extra sets of drawings will be provided to the contractor for this purpose. Any changes in the exterior work shall be recorded by dimension.

3.8 OPERATION AND MAINTENANCE INSTRUCTIONS

- A. Before final acceptance of the electrical installation, provide to the Architect / Engineer three (3) bound copies of a complete set of operating and maintenance instructions and procedures for all electrical systems and equipment furnished under this contract.
- B. Prepare a complete file of maintenance and operating instructions which covers all electrical systems and equipment listed in the section entitled "Submittals".

- C. Data shall be placed in an 8-1/2" x 11" slide hinge, heavy duty, three-post type, stiff cover binder. Each completed binder shall not exceed 3-1/2" in thickness. Label binder as follows:

ELECTRICAL SYSTEMS
MAINTENANCE AND OPERATING INSTRUCTIONS
POPE JAIL AND JDC
PHOTOVOLTAIC SYSTEM INSTALLATION

- D. Data shall include a complete table of contents, tabs, final approved shop drawings, wiring diagrams, manufacturer's operating and maintenance instructions, catalog brochure information, replacement parts lists, name, address and telephone number of nearest stocking supply house.
- E. Drawings shall be neatly folded to approximately 8-1/2" x 11" size and inserted individually into 8-1/2" x 11" sheet protectors which shall be properly punched and inserted into the binder.
- F. All material relative to the equipment shall be filed behind a clearly labeled filing tab. The following information shall be typed on the filing tab page: Item, Manufacturer, Contractor's Order Number, Supplier's Order Number, Manufacturer's Order Number.
- G. Three completed files shall be submitted for review prior to job completion. Final payments will not be certified until the maintenance manuals have been received and reviewed.
- H. Authorized manufacturer's personnel shall instruct (to the Owner's satisfaction) all personnel designated by the Owner in the use of equipment and systems as listed in the section entitled "Submittals".
- I. Provide a minimum of two man days in two trips to the job before the job is accepted for the instruction and training of the Owner's representative in the operation and maintenance of the complete electrical system.
- J. The above does not relieve the contractor of his responsibility of making service calls due to any defect which may develop with systems or equipment during the guarantee period nor shall these service calls be included as part of instruction time. Specific requirements in specifications for factor service representatives is also in addition to above requirements.

3.9 CLEANING UP

- A. Before work can be considered complete, clean all surfaces of all paint, plaster, mortar, labels and other stains and remove all lumps of cement. Take care not to scratch, mar, or damaged surfaces in cleaning.
- B. In case of dispute, the Owner / User may remove the rubbish and charge the cost to the one or more contractors as the Architect / Engineer may determine to be just.

END OF SECTION 26 0500

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid:

1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Building wires and cables rated 600 V and less.
- 2) Connectors, splices, and terminations rated 600 V and less.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. General Cable; General Cable Corporation.
2. Senator Wire & Cable Company.
3. Southwire Company.
4. Nexans.

- B. Copper Conductors: Comply with ASTM B3 for bare concealed copper and with ASTM B8 for stranded conductors.

- C. Conductor Insulation: Comply with UL 83 for Type THHN/THWN-2.

2.2 CONNECTORS AND SPLICES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. 3M.
2. Hubbell Power Systems, Inc.
3. ILSCO.
4. Tyco Electronics Corp.

- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

1. Expandable steel spring and polypropylene body type connectors and wire nuts for wire sizes up to an including No. 10 AWG.

2. Bolt type connectors or mechanical compression crimp type for wire sizes No. 8 AWG and larger. Cover connectors with three layers of 600 volt tape or heat shrinkable insulation equivalent to 150% conductor insulation.

2.3 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger, except VFC cable, which shall be extra flexible stranded.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.
- B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- C. Exposed Branch Circuits, Including in Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- D. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway.
- E. Minimum wire size shall be No. 12 except for internal fixture wire which shall be minimum size of No. 14 type SF, SFF, PF, PFF or TFN, 600 volt.
- F. All branch circuit wiring and feeder cables for circuits over 20 amps shall be sized as noted on the drawings. If size is not specifically noted, size all branch circuit wiring and feeder cables in accordance with the National Electrical Code.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 26 0533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Section 26 0529 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- C. Splices and taps in conductors shall be as few in number as practicable.
- D. Splices and taps shall be so made that they have an electrical resistance not in excess of that of 2' of the conductor.
 - 1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.
- E. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.
- F. Neutral conductors in outlet boxes at receptacles shall be jointed and pigtailed to the outlet. The removal of a receptacle from the circuit shall not affect the continuity of the neutral conductor.

3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 0544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.6 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Division 07 Section "Penetration Firestopping."

3.7 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
 - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

END OF SECTION 26 0519

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid:

1. Contractor

a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Section includes grounding and bonding systems and equipment.
- 2) Section includes grounding and bonding systems and equipment plus the following special applications:
 - a) Underground distribution grounding.
 - b) Foundation steel electrodes.

1.2 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Burndy; Part of Hubbell Electrical Systems.
 2. Dossert; AFL Telecommunications LLC.
 3. ERICO International Corporation.
 4. Fushi Copperweld Inc.
 5. Galvan Industries, Inc.; Electrical Products Division, LLC.
 6. Harger Lightning & Grounding.
 7. ILSCO.
 8. O-Z/Gedney; a brand of Emerson Industrial Automation.
 9. Robbins Lightning, Inc.
 10. Siemens Power Transmission & Distribution, Inc.

2.2 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

2.3 CONDUCTORS

- A. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

2.4 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

2.5 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits. Separate grounding conductors are not shown on the drawings but shall be included in all raceways as set forth on the drawings.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70. Separate grounding conductors are not shown on the drawings but shall be included in all raceways as set forth on the drawings.
 - 1. Feeders and branch circuits.
 - 2. PV circuits and support structures.

3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

END OF SECTION 26 0526

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid:

1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Hangers and supports for electrical equipment and systems.
- 2) Construction requirements for concrete bases.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:

- a. Hangers.
- b. Steel slotted support systems.

2. Include rated capacities and furnished specialties and accessories.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4 factory-fabricated components for field assembly.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Cooper B-Line, Inc.; a division of Cooper Industries.
- b. Flex-Strut Inc.
- c. Unistrut; an Atkore International company.

2. Material: Galvanized steel.

3. Channel Width: 1-5/8 inches.

4. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.

5. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

6. Channel Dimensions: Selected for applicable load criteria.

B. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as

required to suit individual conductors or cables supported. Body shall be made of malleable iron.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems unless requirements in this Section are stricter.
- B. Comply with requirements for raceways and boxes specified in Section 26 0533 "Raceways and Boxes for Electrical Systems."
- C. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMTs, IMCs, and RMCs as scheduled in NECA 1, where its Table 1 lists maximum spacings that are less than those stated in NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- D. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 - 1. Secure raceways and cables to these supports with single-bolt conduit clamps using spring friction action for retention in support channel.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.
- B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To New Concrete: Bolt to concrete inserts.
 - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 4. To Existing Concrete: Expansion anchor fasteners. Anchors using explosive charges to drive inserts into concrete shall not be used.
 - 5. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69 or metal framing channel welded to structure.
 - 6. To Light Steel: Sheet metal screws.
 - 7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that comply with seismic-restraint strength and anchorage requirements.
- D. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.3 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.
- C. Prime paint all structural steel installed for pipe or equipment supports or burned by welding with one coat of rust inhibitive black paint at the time of installation.

END OF SECTION 26 0529

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid:

1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Metal conduits, tubing and fittings.
- 2) Surface raceways.
- 3) Boxes, enclosures and cabinets.
- 4) Nonmetal conduits, tubing and fittings.

1.2 DEFINITIONS

- A. GRC: Galvanized rigid steel conduit.

1.3 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Allied Tube & Conduit; a part of Atkore International.
2. Republic Conduit.
3. Western Tube and Conduit Corporation.

- B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- C. GRC: Comply with ANSI C80.1 and UL 6.

- D. EMT: Comply with ANSI C80.3 and UL 797.

- E. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

- F. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.

1. Fittings for EMT:

- a. Material: Steel.
- b. Type: Compression.

2. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.

2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Allied Tube and Conduit: A Part of Atkore International
 - 2. CANTEX INC.
 - 3. Electri-Flex Company.
- B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
- D. Rigid HDPE: Comply with UL 651A.
- E. Continuous HDPE: Comply with UL 651B.
- F. Coilable HDPE: Preassembled with conductors or cables, and complying with ASTM D 3485.
- G. Fittings for RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

2.3 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cooper Technologies Company.
 - 2. Hubbell Incorporated.
 - 3. MonoSystems, Inc.
 - 4. RACO; Hubbell.
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, aluminum, Type FD, with gasketed cover.
- D. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.
- E. Gangable boxes are prohibited.
- F. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 3R with continuous-hinge cover with flush latch unless otherwise indicated.
 - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
 - 2. Nonmetallic Enclosures: Plastic.
 - 3. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.
- G. Cabinets:
 - 1. NEMA 250, Type 3R galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
 - 2. Hinged door in front cover with flush latch and concealed hinge.
 - 3. Key latch to match panelboards.
 - 4. Metal barriers to separate wiring of different systems and voltage.

5. Accessory feet where required for freestanding equipment.
6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.4 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

A. General Requirements for Handholes and Boxes:

1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Armorcast Products Company.
 - b. Carson Industries LLC.
 - c. NewBasis.
 - d. Oldcastle Precast, Inc.
 - e. Quazite: Hubbell Power Systems, Inc.
2. Standard: Comply with SCTE 77.
3. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
6. Cover Legend: Molded lettering, "ELECTRIC" or "PV".

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Subject to Physical Damage: GRC
2. Exposed, Not Subject to Physical Damage: EMT
3. Underground Conduit: RNC, Type EPC-40-PVC.
4. Connection Equipment: LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed and Subject to Physical Damage: EMT. Raceway locations include the following:
 - a. Mechanical rooms.
3. Concealed in Ceilings and Interior Walls and Partitions: EMT.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.

- 5. Boxes and Enclosures: NEMA 250, Type 1.
- C. Minimum Raceway Size: 3/4-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
 - 1. EMT: Use compression, steel fittings. Comply with NEMA FB 2.10.
 - 2. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

3.2 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Comply with requirements in Section 26 0529 "Hangers and Supports for Electrical Systems" for hangers and supports.
- E. Conduits and raceways shall not be supported from plumbing lines, ductwork or supports for equipment provided by other trades.
- F. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- G. Install no more than the equivalent of three 90-degree bends in any conduit run. Support within 12 inches of changes in direction.
- H. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines. In mechanical equipment rooms conduit and EMT may be exposed at the ceiling or on the walls. No surface-mounted conduit shall be permitted in finished spaces unless noted otherwise on drawings.
- I. Support conduit within 12 inches of enclosures to which attached.
- J. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- K. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- L. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- M. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- N. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.
- O. Comply with manufacturer's written instructions for solvent welding RNC and fittings.

- P. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit (FMC) for equipment subject to vibration, noise transmission, or movement.
 - 1. Use LFMC in damp or wet locations subject to severe physical damage.
 - 2. Use LFMC in damp or wet locations not subject to severe physical damage.
- Q. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- R. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.3 EXCAVATION AND BACKFILLING

- A. The Contractor is to call JULIE (Joint Utility Location Information for Excavators) at 800-892-0123 at least two business days prior to any digging, excavation, boring, or other such work. The contractor shall recognize that the JULIE locating service locates only those utilities that participate in the JULIE program and that non-participating utilities, privately-owned utilities, and the Owner's own services will not be located by JULIE. The contractor shall also recognize that the contract documents do not claim to show all utilities existing on the site. In addition to JULIE, the contractor shall provide, at their expense, the services of a private locating service to identify and locate all utilities, public and private, that could be affected by the contractor's work. The contractor shall repair all damage caused by the Contractor's activities promptly to the satisfaction of the owner of the damaged utility. All such repairs shall be conducted at the sole expense of the Contractor that damaged the utility.
- B. Conduct all excavations so that no personnel shall be endangered and no building walls or footings shall be disturbed or injured.
- C. Excavate to dimensions and elevations required for work.
- D. Remove any old foundations, building construction, and other materials concealed beneath present grade, where required to execute work, and as indicated.
- E. If undesirable material is encountered during excavation, remove and replace material as directed by Architect / Engineer.
- F. Properly level off bottoms of all excavations.
- G. Remove all rocks, lumps, frozen ground, soft or wet material, vegetation, and other foreign material upon which fill is to be placed.
- H. Scarify top 12" (300 mm) of earth and compact to 95% of maximum dry density.
- I. Place fill material in 9" lifts and compact each lift to 90%.
- J. Maintain between 0% below and 3% above optimum moisture content during compaction.
- K. Compact fill and backfill using suitable mechanical tamping equipment to obtain specified density.
 - 1. Use mechanical hand tampers for filling and backfilling next to walls.
 - 2. Compact granular fill using vibratory methods.
- L. Do not permit water to accumulate or remain in trench or other excavation that is a part of this contract. Dispose of water withdrawn from excavations in a manner that will not cause injury to public health, public or private property, or to the work already completed or in progress.

- M. All backfill material under buildings, sidewalks, streets, curbs and within 5' of footings shall be sand and gravel, free from cinders, ashes, refuse, vegetable or organic material, boulders, large rocks or stones. Where a utility passes under a building footing, backfill material shall be concrete up to footing bearing surface.
- N. Load excavated materials which are to be replaced with sand and gravel backfill, directly from the trench into trucks, remove from the construction area and properly dispose of if where directed.
- O. Extreme caution must be used in excavating for new underground services to avoid all damage to existing underground utilities in the working area. Confirm where possible, the exact location of all existing utilities. In the event of a break in an existing utility main or service, immediately notify an official from the utility interrupted and lend all possible assistance in restoring services cut. Also, assume costs or claims connected with the interruption and repair of such service.
- P. Excavate the trenches to the depth required so as to provide a uniform and continuous bearing and support for the pipe on solid undisturbed ground or compacted fill.
- Q. Wherever excavations are made through streets, sidewalks, parking areas, curbs or other finished surfaces, replace such surfaces with material to match existing surfaces. Where reinforcing steel in concrete is required, install it in a manner similar to that used in existing surfaces.
- R. If it is necessary to drive trucks or equipment over sidewalks, pavement, streets, and curbs, take care to protect same from damage. If such surfaces are damaged, replace same with new materials, same type and thickness and in the manner as the original.
- S. Reuse original surface materials if, in the opinion of the Architect / Engineer, they are suitable for use in restoration.
- T. Excavated material which is to be reused in backfilling or restoring the surface shall be piled in a manner that will not endanger the work and will avoid obstructing sidewalks, driveways or traffic lanes which are to be maintained during construction.
- U. Keep all excavated top soil separated from excavation soil. Stock pile sufficient top soil to provide 6" top soil at all graded areas. Provide any additional soil from off-site source if required.

3.4 INSTALLATION OF UNDERGROUND CONDUIT

- A. Direct-Buried Conduit:
 - 1. Excavate trench bottom to provide firm and uniform support for conduit.
 - 2. Install backfill as specified in Section above.
 - 3. Install manufactured rigid steel conduit elbows for stub-ups at equipment and at building entrances.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
 - 4. Underground Warning Tape: Comply with requirements in Section 26 0553 "Identification for Electrical Systems."

3.5 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
- B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 0544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to paint finishes with matching touchup coating recommended by manufacturer.
- B. Protect work from injury by keeping all conduit and boxes capped and plugged or otherwise protected. This includes damage by freezing and / or stoppage from building materials, sand, dirt or concrete.

END OF SECTION 26 0533

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid:

1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
- 2) Sleeve-seal systems.
- 3) Grout.
- 4) Silicone sealants.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SLEEVES

A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.

- B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

2.2 GROUT

- A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

2.3 SILICONE SEALANTS

- A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.

- B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

- A. Comply with NECA 1.
- B. Comply with NEMA VE 2 for cable penetrations.
- C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
 - 1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
 - a. Seal annular space between sleeve and raceway or cable, using silicone sealant appropriate for size, depth, and location of joint.
 - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
 - 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed.
 - 4. Install sleeves for all wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
 - 5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches above finished floor level. Install sleeves during erection of floors.
- D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
 - 1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.
- E. Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing mechanical sleeve-seal system.

END OF SECTION 26 0544

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid:

1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Identification for raceways.
- 2) Equipment identification labels, including arc-flash warning labels.
- 3) Miscellaneous identification products.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with NFPA 70.

B. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 LABELS

A. Self-Adhesive Labels:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. A'n D Cable Products.
- b. Brady Corporation.
- c. Brother International Corporation.
- d. emedco.
- e. Grafoplast Wire Markers.
- f. Ideal Industries, Inc.
- g. LEM Products Inc.
- h. Marking Services, Inc.
- i. Panduit Corp.

2. Vinyl, thermal, transfer-printed, 3-mil-thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.

- a. Nominal Size: 3.5-by-5-inch.

2.3 TAPES AND STENCILS:

- A. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by 1 to 2 inches wide; compounded for outdoor use.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Carlton Industries, LP.
 - c. emedco.
- B. Underground-Line Warning Tape
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Ideal Industries, Inc.
 - c. LEM Products Inc.
 - d. Marking Services, Inc.
 - e. Reef Industries, Inc.
 2. Tape:
 - a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
 - b. Printing on tape shall be permanent and shall not be damaged by burial operations.
 - c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
 3. Color and Printing:
 - a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
 - b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE".
 4. Tape Construction:
 - a. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core; bright colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
 - b. Width: 3 inches.
 - c. Overall Thickness: 5 mils.
 - d. Foil Core Thickness: 0.35 mil.
 - e. Tensile according to ASTM D 882: 70 lbf and 4600 psi.

2.4 SIGNS

- A. Laminated Acrylic or Melamine Plastic Signs:
 1. Engraved legend.
 2. Thickness:

- a. For signs up to 20 sq. inches, minimum 1/16-inch-.
 - b. For signs larger than 20 sq. inches, 1/8 inch thick.
 - c. Engraved legend with black letters on white face.
 - d. Punched or drilled for mechanical fasteners.
 - e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.
3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- a. Brady Corporation.
 - b. Carlton Industries, LP.
 - c. emedco.

2.5 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 INSTALLATION

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.
- B. Install identifying devices before installing acoustical ceilings and similar concealment.
- C. Verify identity of each item before installing identification products.
- D. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.
- E. Apply identification devices to surfaces that require finish after completing finish work.
- F. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- G. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.

3.3 IDENTIFICATION SCHEDULE

- A. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with indelible marker containing the wiring system legend, system voltage and circuit. System legends shall be as follows:

1. "PV POWER."
- B. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
 1. Color-Coding for Phase- and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded service feeder and branch-circuit conductors.
 - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG if authorities having jurisdiction permit.
 - b. Colors for 208/120-V Circuits:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - 4) Neutral: White.
 - 5) Ground: Green.
 - c. Colors for 480/277-V Circuits:
 - 1) Phase A: Brown.
 - 2) Phase B: Orange.
 - 3) Phase C: Yellow.
 - 4) Neutral: White.
 - 5) Ground: Green with yellow stripe.
 - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- C. Locations of Underground Lines: Identify with underground-line warning tape for power / PV system.
 1. Install underground-line warning tape for direct-buried cables and cables in raceways.
- D. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm unless equipment is provided with its own identification.
 1. Labeling Instructions:
 - a. Indoor Equipment: Engraved, laminated acrylic or melamine plastic label, punched or drilled for mechanical fasteners. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.
 - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
 - c. Fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
 2. Equipment To Be Labeled:
 - a. PV System Circuit Breakers.
 - b. PV System enclosures and electrical cabinets.
 - c. PV System disconnect switches.

- d. PV string designations.
- e. PV inverters and all associated PV equipment.

END OF SECTION 26 0553

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid:

1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

1) Cartridge fuses rated 600 V ac and less for use in the following:

- a) Control circuits.
- b) Motor-control centers.
- c) Panelboards.
- d) Switchboards.
- e) Enclosed controllers.
- f) Enclosed switches.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for spare-fuse cabinets. Include the following for each fuse type indicated:

- 1. Ambient Temperature Adjustment Information: If ratings of fuses have been adjusted to accommodate ambient temperatures, provide list of fuses with adjusted ratings.
 - a. For each fuse having adjusted ratings, include location of fuse, original fuse rating, local ambient temperature, and adjusted fuse rating.
 - b. Provide manufacturer's technical data on which ambient temperature adjustment calculations are based.
- 2. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
- 3. Current-limitation curves for fuses with current-limiting characteristics.
- 4. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse. Submit in PDF format.
- 5. Coordination charts and tables and related data.
- 6. Fuse sizes for elevator feeders and elevator disconnect switches.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fuses to include in emergency, operation, and maintenance manuals.

- 1. Ambient temperature adjustment information.
- 2. Current-limitation curves for fuses with current-limiting characteristics.
- 3. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse used on the Project. Submit in PDF format.
- 4. Coordination charts and tables and related data.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.

1.5 FIELD CONDITIONS

- A. Where ambient temperature to which fuses are directly exposed is less than 40 deg F or more than 100 deg F, apply manufacturer's ambient temperature adjustment factors to fuse ratings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Bussmann, an Eaton business.
 - 2. Edison; a brand of Bussmann by Eaton.
 - 3. Littelfuse, Inc.
 - 4. Mersen USA.
- B. Source Limitations: Obtain fuses, for use within a specific product or circuit, from single source from single manufacturer.

2.2 CARTRIDGE FUSES

- A. Characteristics: NEMA FU 1, current-limiting, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.
 - 1. Type RK-1: 250 or 600-V, zero- to 600-A rating, 200 kAIC, time delay.
 - 2. Type L: 600-V, 601- to 6000-A rating, 200 kAIC, time delay.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with NEMA FU 1 for cartridge fuses.
- D. Comply with NFPA 70.
- E. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fuses before installation. Reject fuses that are moisture damaged or physically damaged.
- B. Examine holders to receive fuses for compliance with installation tolerances and other conditions affecting performance, such as rejection features.

- C. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.
- D. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FUSE APPLICATIONS

- A. Cartridge Fuses:
 - 1. Service Entrance, 601 Amp through 6000 Amp: Class L, time delay.
 - 2. Feeders, up to 600 Amp: Class RK1, time delay.
 - 3. Motor Branch Circuits: Class RK1, time delay.
 - 4. Other Branch Circuits: Class RK1, time delay.
 - 5. Provide open-fuse indicator fuses or fuse covers with open fuse indication.

3.3 INSTALLATION

- A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

3.4 IDENTIFICATION

- A. Install labels complying with requirements for identification specified in Section 26 0553 "Identification for Electrical Systems" and indicating fuse replacement information inside of door of each fused switch and adjacent to each fuse block, socket, and holder.

END OF SECTION 26 2813

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid:

1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Fusible switches.
- 2) Nonfusible switches.
- 3) Shunt trip switches.
- 4) Molded-case circuit breakers (MCCBs).
- 5) Enclosures.

1.2 DEFINITIONS

- A. NC: Normally closed.
- B. NO: Normally open.
- C. SPDT: Single pole, double throw.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

1. Enclosure types and details for types other than NEMA 250, Type 1.
2. Current and voltage ratings.
3. Short-circuit current ratings (interrupting and withstand, as appropriate).
4. Include evidence of a nationally recognized testing laboratory (NRTL) listing for series rating of installed devices.
5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.
6. Include time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device. Provide in PDF electronic format.

- B. Shop Drawings: For enclosed switches and circuit breakers.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Include wiring diagrams for power, signal, and control wiring.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:

- a. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 1. Ambient Temperature: Not less than minus 22 deg F and not exceeding 104 deg F.
 2. Altitude: Not exceeding 6600 feet.

1.6 WARRANTY

- A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace components that fail in materials or workmanship within specified warranty period.
 1. Warranty Period: One year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.
- B. Source Limitations:
 1. Obtain fusible switches, non-fusible switches, molded case circuit breakers and switches from the same manufacturer as:
 - a. Enclosed controllers.
 - b. Switchboards.
 - c. Distribution panelboards.
 - d. Branch circuit panelboards.
 - e. Motor control centers.
 - f. Enclosed busway.
 - g. Low voltage transformers.
- C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.
- E. Comply with NFPA 70.

2.2 FUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Eaton.
 2. General Electric Company.
 3. Siemens Industry, Inc.

4. Square D; by Schneider Electric.

B. Type HD, Heavy Duty:

1. Single throw.
2. Three pole.
3. 240-V ac or 600-V ac as shown on drawings.
4. UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate indicated fuses.
5. Lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
4. Auxiliary Contact Kit: One NO/NC (Form "C") auxiliary contact(s), arranged to activate before switch blades open. Contact rating - 240-V ac.
5. Lugs: Mechanical type, suitable for number, size, and conductor material.

2.3 NONFUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton.
2. General Electric Company.
3. Siemens Industry, Inc.
4. Square D; by Schneider Electric.

B. Type HD, Heavy Duty, Three Pole, Single Throw, 240-V ac or 600-V ac as shown drawings, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Auxiliary Contact Kit: One NO/NC (Form "C") auxiliary contact(s), arranged to activate before switch blades open. Contact rating - 240-V ac.
4. Lugs: Mechanical type, suitable for number, size, and conductor material.

2.4 ENCLOSURES

A. Enclosed Switches and Circuit Breakers: UL 489, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.

B. Enclosure Finish: The enclosure shall be finished with gray baked enamel paint, electrodeposited on cleaned, phosphatized steel (NEMA 250 Type 1).

- C. Conduit Entry: NEMA 250 Types 4, 4X, and 12 enclosures shall contain no knockouts. NEMA 250 Types 7 and 9 enclosures shall be provided with threaded conduit openings in both endwalls.
- D. Enclosures designated as NEMA 250 Type 4, 4X stainless steel, 12, or 12K shall have a dual cover interlock mechanism to prevent unintentional opening of the enclosure cover when the circuit breaker is ON and to prevent turning the circuit breaker ON when the enclosure cover is open.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Commencement of work shall indicate Installer's acceptance of the areas and conditions as satisfactory.

3.2 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS

- A. Enclosed Switches and Circuit Breakers: Provide enclosures at installed locations with the following environmental ratings.
 - 1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
 - 2. Outdoor Locations: NEMA 250, Type 3R.

3.3 INSTALLATION

- A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- C. Comply with mounting and anchoring requirements specified in Section 26 0548.16 "Seismic Controls for Electrical Systems."
- D. Temporary Lifting Provisions: Remove temporary lifting of eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
- E. Install fuses in fusible devices.
- F. Comply with NFPA 70 and NECA 1.

3.4 IDENTIFICATION

- A. Comply with requirements in Section 26 0553 "Identification for Electrical Systems."
 - 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 - 2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.5 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections for Switches:
 - 1. Visual and Mechanical Inspection:
 - a. Inspect physical and mechanical condition.
 - b. Inspect anchorage, alignment, grounding, and clearances.
 - c. Verify that the unit is clean.
 - d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.
 - e. Verify that fuse sizes and types match the Specifications and Drawings.
 - f. Verify that each fuse has adequate mechanical support and contact integrity.
 - g. Inspect bolted electrical connections for high resistance using one of the two following methods:
 - 1) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.
 - a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.
 - h. Verify correct phase barrier installation.
 - i. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.
- C. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

3.6 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

END OF SECTION 26 2816

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid:

1. Electrical Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Photovoltaic modules.
- 2) Inverters.
- 3) Combiner boxes.
- 4) Ground mounting structure for modules.
- 5) PV system monitoring.
- 6) PV metering.

1.2 DEFINITIONS

- A. DC / AC – Direct Current / Alternating Current
- B. EGC – Equipment Grounding Conductor
- C. kWdc / kWac – DC-rated kilowatts / AC-rated kilowatts
- D. kWh – kilowatt-hour (energy)
- E. NABCEP: North American Board of Certified Energy Practitioners
- F. MPPT – Maximum Power Point Tracking
- G. OCPD – Overcurrent Protective Device
- H. POI – Point of Interconnection
- I. PV – Photovoltaic
- J. TRD – Total Rated-current Distortion

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product, including furnished options and accessories.

1. Include construction details, material descriptions, dimensions, profiles, and finishes.
2. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

- B. System Layout and Electrical Coordination Drawings: Submit a set of drawings including the following:

1. PV Layout Drawings: Dimensioned PV layout drawings showing array boundaries, module layout, access pathways, setbacks, restricted/no-go zones, and location(s) of PV equipment.
2. Interconnection Identification: Identify the point(s) of interconnection (POI) to the serving utility system and the host facility metering point(s).

3. One-Line Diagram: Project-specific electrical one-line diagram from PV source circuits through POI, including OCPD, disconnects, grounding/bonding, rapid shutdown/hazard control equipment (if applicable), and meters (if applicable).
 4. Wiring Diagrams and Schedules: Provide conductor/cable schedules and termination schedules for DC, AC, grounding/bonding, and communications wiring (as applicable).
- C. Mounting System Structural Conformance Submittal: Submit a complete mounting-system conformance package demonstrating that the proposed PV mounting solution conforms to the Structural Design Basis and Allowable Structural Limits and Restrictions stated in Part 1 of this specification
1. Design Criteria Summary (tabulated inputs): Provide a single summary table listing the project-specific design inputs used for the mounting-system engineering.
 2. Provide maps for dead load, snow load, wind uplift, and final combined download (where manufacturer report format provides these per-module or per-bay).
 3. Design Method and Code Edition Statement: Identify the building code edition and design method used for the mounting system engineering (e.g., ASCE 7 edition) to confirm compatibility with the project criteria.
 4. Conformance Statement: Provide a signed statement from the Contractor indicating the mounting layout and engineering conform to the specification's Structural Design Basis and Allowable Structural Limits, and that the system will be installed in accordance with the approved layout.
- D. System Performance Modeling Submittal: Provide a PV system performance model using an industry-standard PV modeling tool capable of estimating annual and monthly energy production and accounting for system losses, shading, and weather
1. Modeling Software Requirement: Modeling tools shall be appropriate for commercial PV design and shall include, at minimum, the ability to model site geometry and solar access.
 2. System Configuration Inputs: Submit model inputs and assumptions used, including at minimum:
 - a. System DC nameplate (kW_{dc}) and AC nameplate (kW_{ac}) and DC/AC ratio.
 - b. Module manufacturer/model and quantity; inverter manufacturer/model and quantity (or equal detail for microinverters/MLPE).
 - c. Mounting type and tilt/azimuth assumptions consistent with Contract Documents.
 - d. Weather dataset/source and location used for the simulation (TMY or equivalent).
 - e. Loss assumptions (explicitly list values used): soiling, shading, mismatch, DC wiring, AC wiring, inverter efficiency/clip, availability, temperature model assumptions, and any curtailment/export limiting assumptions if applicable.
 3. Performance Outputs: Provide a performance report including, at minimum:
 - a. Estimated annual PV production (kWh/year) and first-year production.
 - b. Monthly production (kWh) profile and (where available) monthly production compared to facility load or historic usage profile.
 - c. Production as a percentage of annual facility usage (if facility usage data is provided) and/or annual offset estimate.
 - d. Summary of key system metrics such as performance ratio (PR) and/or specific yield (kWh/kW_{dc}-year), if produced by the modeling tool.

4. Graphics / Layout Exhibit: Provide a site plan exhibit from the modeling tool showing array location and module layout sufficient to correlate with the construction drawings (example performance reports commonly include a modeled layout image as part of the performance package).
5. Degradation and Availability Assumptions: State the assumed annual module degradation rate and system availability used in the model and/or in the long-term financial analysis (degradation rate is commonly stated in the financial assumptions).

E. System Financials and Incentives Submittal

1. Incentives and Rebates Summary: Submit a written summary and itemized estimate of all applicable incentives, rebates, and credits required by the Contract Documents (examples include items such as SREC-related values, inverter rebates, and federal incentives).
 - a. Identify program name, eligibility basis, assumed pricing/value, payment timing, and any fees/collateral/bond requirements where applicable.
 - b. Clearly identify which incentives are estimates and which are confirmed (if any), and state the basis for each estimate.
2. Year 1 Energy Cost Savings: Provide a Year 1 savings estimate based on the owner-provided utility rate structure (or owner-provided historical bills), showing baseline annual cost and projected annual cost with PV, and resulting Year 1 savings.
3. 25-Year Cash Flow Pro Forma: Provide a 25-year (minimum) cash flow table (30-year acceptable if consistent with proposal) showing annual cash flows, cumulative cash flow, and key metrics. The pro forma shall include at minimum:
 - a. Upfront project costs and timing of expenditures.
 - b. Annual energy cost savings.
 - c. All incentive and rebate cash flows by year, with payment timing consistent with program requirements (e.g., multi-year SREC payment streams, rebates, tax credit/direct pay timing, and any collateral return timing where applicable).
 - d. Annual PV generation (kWh) and the assumed degradation rate applied over time.
 - e. O&M costs and major component replacements (at minimum: inverter replacement schedule if assumed/required; include any other major replacements/refresh assumptions). (Example pro formas typically disclose degradation and other assumptions alongside metrics.)
 - f. Utility rate escalation assumption: use 2% unless otherwise specified in the Contract Documents; state the escalation rate used.
 - g. Clearly state all other assumptions used (discount rate, inflation, financing assumptions if any, tax rate assumptions if applicable).
4. Key Financial Metrics: Provide at minimum:
 - a. Simple payback period (years).
 - b. Net present value (NPV) and IRR (if used), and the discount rate applied.
 - c. Levelized cost of energy (LCOE) or equivalent normalized cost metric, if required by Contract Documents.
5. Cash Flow Table Format: Provide a single table showing annual line items for: project costs, electric bill savings, each incentive/rebate/credit item, PV generation (kWh), total annual cash flow, and cumulative cash flow (example reports show a year-by-year cash flow table with assumptions and cumulative totals).

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For system installer.
- B. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For photovoltaic system and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
 - 1. Manufacturer's written instructions for testing and troubleshooting system components.
 - 2. Warranties.
 - 3. Operation instructions.
 - 4. Preventive maintenance and inspection data, including a schedule for system operators.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Photovoltaic system must be properly licensed and legally authorized to perform the Work in the project jurisdiction, including electrical contracting work and any specialty work required.
 - 1. Installer shall comply with all applicable federal, state, and local laws and permitting requirements, including utility interconnection requirements.
 - 2. Installer shall submit documentation demonstrating compliance with the above installer qualifications.
- B. Incentive and Tax Credit Program Eligibility Requirements
 - 1. Installer shall be capable of installing the PV system in a manner that supports participation in all incentives and credits required by the Contract Documents, including federal tax credits (or direct pay where applicable), State of Illinois incentive programs (e.g., Illinois Shines), and any applicable utility rebates (e.g., smart inverter or similar programs), as applicable to the Project.
 - 2. Contractor shall comply with all applicable program requirements and documentation needed for the Owner to claim incentives/credits, including but not limited to: project registration/eligibility steps, equipment eligibility requirements, commissioning/verification documentation, and any required reporting.
 - 3. Where required to obtain full federal credit value, Contractor shall comply with applicable prevailing wage and apprenticeship requirements and maintain documentation suitable for the Owner's tax filings (if applicable to the Project scope/size and Owner's tax posture).
 - 4. Installer shall submit documentation demonstrating compliance with the above incentive and tax credit program eligibility requirements.
- C. Experience Requirements
 - 1. Installer shall have a minimum of 3 years of experience installing commercial-scale photovoltaic systems.
 - 2. Contractor shall have successfully completed at least 3 PV installations within the last 3 years with each project having a minimum DC capacity of 100 kWdc, and involving equipment and mounting types similar to this Project.
 - 3. Installer shall submit documentation demonstrating compliance with the above experience requirements.

D. Performance Guarantee

1. Contractor shall provide a written PV System Performance Guarantee for the completed, Owner-owned PV system. The guarantee period shall be two years from the date of Substantial Completion.
2. Contractor guarantees that the PV system will produce not less than 90% of the Baseline Annual Energy Production during the guarantee period, evaluated over the full two-year period.
3. Baseline Annual Energy Production shall be established from the Contractor's final approved PV performance model submitted under Action Submittals, updated to reflect the final as-built equipment, system size (kWdc), tilt/azimuth, and installed layout.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store solar PV modules in their original packaging according to the manufacturer's guidance, and do not remove them from packaging until day of installation.
- B. If a solar PV module is removed from its packaging, store it according to the manufacturer's guidance.
- C. Do not store solar PV modules on-site for more than 12 months.
- D. Handle and prepare PV system equipment and components for installation in accordance with NECA 412 and NECA 1.

1.8 FIELD CONDITIONS

- A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
 1. Notify Architect and Owner no fewer than seven days in advance of proposed interruption of electric service.
 2. Do not proceed with interruption of electric service without Architect's or Owner's written permission.
 3. Comply with NFPA 70E.
- B. Structural Design Basis: All photovoltaic systems and mounting solutions shall conform to the below information.
 1. Risk Category: III.
 2. Wind design parameters:
 - a. Ultimate Design Wind Speed (V_{ult}): 114 mph.
 - b. Exposure Category: C.
 - c. Enclosure classification: Enclosed.
 - d. Topographic Factor (K_{zt}): 1.0.
 3. Snow design parameters
 - a. Ground Snow Load (P_g): 46 psf.
 4. Seismic Design Category: C.

1.9 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace system components that fail in materials or workmanship within specified warranty period.

1. Photovoltaic Module: Furnish the solar photovoltaic module manufacturer's written warranty. The warranty must be a 25-year linear 80 percent (minimum) power warranty (at the end of the 25th year after purchase an actual minimum power output of 80 percent based on the nameplate rating must be achieved) and not less than 10 years for workmanship material and manufacturing defects from the date of manufacture. The warranty must state that the malfunctioning solar photovoltaic module must be exchanged by the manufacturer and promptly shipped to the owner's facility. The replacement solar module must be identical to, or an improvement upon, the original design of the malfunctioning solar module.
2. Inverter: Furnish the inverter manufacturer's warranty. Inverter to be free from defects in material and workmanship for a minimum of 10 years.
3. Mounting System: Provide PV mounting system warranty of minimum 20 years.
4. Combiner Boxes: Combiner boxes to be free from defects in material and workmanship for a period of 5 years.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. The photovoltaic (PV) system shall be a behind-the-meter generating facility interconnected with Ameren Illinois in accordance with the utility's current tariffs, interconnection requirements, and applicable regulations. The PV system shall be installed as a ground-mounted array at the Champaign County Pope Jail and Juvenile Detention Center, with system size, equipment locations, and points of interconnection as indicated on the Drawings. The total installed PV system capacity shall be 500 kWdc and 150 kWdc (nominal) for the Champaign County Pope Jail and Juvenile Detention Center, respectively. Energy generated by the PV system shall be used to offset electrical energy otherwise supplied through the facility meter(s), thereby reducing metered consumption and energy cost, while any authorized export shall occur only as permitted by the approved interconnection agreement.
- B. The installation shall include, but is not limited to, securing all permits and approvals from governing agencies, Ameren Illinois, and applicable regulatory authorities for all equipment necessary to construct a fully operational solar photovoltaic electric generating system.
- C. The contractor shall develop and submit the Ameren Illinois interconnection and related permit applications.
- D. Project Financing: The owner is seeking to enter into an Agreement with one contractor to furnish and install the specified photovoltaic system under a cash purchase arrangement. The owner requires that the photovoltaic system be owned by them upon system energization.

2.2 GENERAL PRODUCT REQUIREMENTS

- A. Standard Materials and Products
 1. Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Provide products with satisfactory commercial or industrial use for two years prior to bid opening, and past performance documentation with consistent design and bill of materials.
 - a. Products having less than a two-year field service record will be acceptable if the manufacturer has been regularly engaged in the design and production of solar photovoltaic products for a minimum of 5-years. Similar photovoltaic products must have been in satisfactory commercial or industrial use for 5-years prior to bid

opening and must have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 5-year period.

- B. Where two or more items of the same class of equipment are required, products will be from a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in the technical section.
- C. Material and Equipment Manufacturing Date: Products manufactured more than three years prior to date of delivery to site must not be used, unless specified otherwise.

2.3 PHOTOVOLTAIC MODULES

- A. PV modules shall be supplied by a Bloomberg New Energy Finance (BNEF) Tier 1 module manufacturer current within the most recent published reporting period.
- B. PV modules shall be monocrystalline technology.
- C. PV Modules must be compliant with the following standards:
 - 1. Fabricated in an ISO 9001 facility.
 - 2. For design qualification: IEC 61215.
 - 3. For module safety construction and testing: IEC 61730.
 - 4. For PID resistance: IEC 62804.
- D. PV module performance characteristics:
 - 1. Minimum nameplate power: 580 Wdc (or approved equal) at Standard Test Conditions (STC).
 - 2. Power tolerance (positive-only): 0 to +5 W.
 - 3. Operating temperature range: -40°C to +85°C (-40°F to 185°F).
- E. General PV module requirements:
 - 1. PV module efficiency must be greater than 19 percent.
 - 2. Provide PV modules of the same manufacturer, model number, and nameplate rating. All modules shall use the same cell technology, junction box type, and connector type within the array.
 - 3. Modules shall include factory-installed bypass diodes within a factory-sealed junction box rated IP67 or better (or NEMA equivalent), suitable for outdoor exposure.
 - 4. PV connectors shall be locking/latching type and listed to UL 6703, rated for the system voltage.

2.4 INVERTERS

- A. General
 - 1. Provide grid-interactive inverter(s) suitable for the electrical system configuration and the serving utility interconnection requirements.
 - 2. Provide inverters of the same manufacturer and model number for all inverters of the same size/rating.
- B. Certifications and Compliance
 - 1. Inverters shall be listed/labeled by an NRTL and comply with UL 1741 (latest edition applicable) including Supplement SB (or utility-accepted equivalent) and shall be certified for interconnection in accordance with IEEE 1547-2018 and tested per IEEE 1547.1.
 - 2. Inverters shall comply with FCC Part 15, Class A as an unintentional radiator.

3. Power quality (including harmonic current injection limits) shall comply with IEEE 1547 requirements. (IEEE 1547 uses Total Rated-current Distortion (TRD) terminology.)

C. Electrical Performance and Sizing

1. Size inverters such that the DC/AC ratio of the system and PV array oversizing are within manufacturer published limits.
2. Provide minimum peak efficiency of $\geq 97\%$ for string inverters and include CEC/weighted efficiency data in submittals.
3. Provide MPPT functionality appropriate for the array design. Submit stringing calculations demonstrating compliance with inverter input limits and MPPT operating window at project design temperatures (cold-weather Voc and hot-weather Vmp).

D. Environmental Ratings and Mounting

1. Provide inverter enclosure rating suitable for installation location: NEMA 3R (minimum) for outdoor, NEMA 1 for indoor (or approved equal per manufacturer listing). Enclosures shall comply with NEMA 250.
2. Provide mounting arrangement appropriate for inverter type and location (wall-mount, floor-mount, or structure-mount) in accordance with manufacturer instructions.

E. Safety Functions

1. Provide anti-islanding protection and grid support functions as part of IEEE 1547 certification.
2. Ground-fault protection, arc-fault protection, and rapid shutdown/shock hazard control shall comply with NFPA 70 (NEC) Article 690 as applicable. Where used, UL 3741 PV Hazard Control System (PVHCS) listing shall be acceptable for rapid shutdown/shock hazard control compliance.

F. Monitoring and Diagnostics

1. Provide inverter(s) with self-diagnostics and both local status indication and remote monitoring capability.
2. Provide communications interface compatible with the project monitoring platform; provide gateway/communications hardware and software as required for complete functioning system.
3. Provide data including real-time power, energy, voltage, current, alarms/faults, and inverter availability. Provide minimum one-year data retention (cloud or local) and export capability.

G. Disconnecting Means

1. Provide AC and DC disconnecting means as required by NEC and the serving utility. Disconnects may be integral or external, lockable, and listed for the intended use. Coordinate locations for safe maintenance and emergency response.

2.5 COMBINER BOXES

- A. Listing: Provide PV combiner boxes that are listed and labeled by an NRTL for the intended use and application. Combiner boxes shall be listed to UL 1741 (or approved equivalent listing standard accepted by the AHJ/utility).
- B. Enclosure: Provide wall-mount or structure-mount enclosures complying with NEMA 250. Outdoor combiner boxes shall be NEMA 3R minimum; provide NEMA 4/4X where exposure warrants. Enclosure material shall be suitable for the environment.

- C. Coordination: Combiner boxes shall be specifically coordinated to the PV source circuit design and the inverter(s) provided, including maximum input voltage, maximum continuous current, short-circuit current, grounding/bonding method, and monitoring/communications (if provided).
- D. Configuration and Protection: Provide combiner boxes with bus and string overcurrent protection (fused or breaker type as indicated on the one-line and as required by NFPA 70). PV fuses and fuse holders (when used) shall be listed for PV duty (e.g., PV fuses evaluated to applicable PV fuse standards such as UL 2579).
 - 1. Number of inputs shall be as required by the design.
 - 2. Fuse/breaker ratings shall be as required by calculations (module Isc, series fuse rating, conductor ampacity, and equipment ratings).
 - 3. Combiner box shall be rated for the site ambient temperature range and for the maximum PV system voltage (1000 Vdc or 1500 Vdc as applicable).
- E. Terminations / Output / Disconnecting Means: Provide output terminals suitable for the conductor sizes indicated and allow conductor paralleling where required by the one-line (do not require paralleling unless shown). Provide output disconnecting means and/or overcurrent protection where required by NFPA 70 and the project design. Provide equipment grounding and bonding provisions compatible with the racking and grounding design.
- F. When combiners are not required: Where the selected inverter(s) include integrated string combining or accept string inputs directly, separate combiner boxes are not required; provide all required protection/terminations within the listed inverter solution.

2.6 RACKING SYSTEMS FOR GROUND-MOUNT APPLICATIONS

- A. Provide a complete PV mounting/racking system suitable for ground-mount installations as indicated on drawings.
 - 1. System shall be provided by a single manufacturer that has demonstrated experience producing code-compliant, commercial ground-mount PV mounting systems, suitable for projects ranging from small arrays through multi-MW scale.
 - 2. System shall be listed and labeled to UL 2703 for the intended configuration and shall include listed bonding/grounding components as part of the system.
 - 3. Racking system shall match module azimuth and tilt as indicated on drawings and shall provide fixed-tilt geometry options appropriate to the Project.
 - 4. Racking and PV array, including modules, hardware, foundations/anchors, and attachments, must withstand seismic loads, snow loads, and wind loads as required by ASCE 7-16 and ICC IBC and as indicated in previous part of this specification.
- B. System performance and listings:
 - 1. System Listing: Mounting system, including module attachment hardware and electrical bonding/grounding devices, shall be ANSI/UL 2703 listed for grounding/bonding and mechanical loading in the provided configuration.
 - 2. Bonding/Grounding Integration: Provide integrated bonding and grounding features within the mounting system (e.g., integrated bonding hardware, bonded clamps, bonded purlin/rail features, or equivalent).
 - 3. System Configuration Flexibility: System shall support common commercial module mounting patterns and typical array table configurations (portrait and/or landscape) and provide standardized/kitted components intended for repeatable installation across array sizes.

C. Materials and components

1. General: Provide a mounting system comprised of corrosion-resistant materials suitable for long-term exterior exposure in a ground-mounted environment.
2. Structural Components: Provide structural members and hardware appropriate for ground-mount use, including (as applicable to the selected system) aluminum module support beams/rails, steel posts/piles (e.g., C-pile or equivalent), and bracing members.
3. Module Attachment Hardware: Provide module clamps/attachment devices designed for framed modules and compatible with common residential and commercial module frame geometries.
4. Bonding/Grounding: Provide a listed bonding/grounding path as part of the system using listed bonding devices and/or integrated bonding features in accordance with the system listing.
5. Wire Management Compatibility: Provide integrated or accessory wire management provisions (snap-on, clip, channel, or equivalent) compatible with the system such that field-fabricated wire supports are not the default approach.

D. Accessories:

1. Provide manufacturer's accessories as required for a complete listed system, including where applicable:
2. Integrated or accessory wire management components.
3. Diagonal bracing assemblies and/or reinforcement components intended for the mounting system configuration.
4. Foundation options appropriate to the project conditions (pile, post, or other manufacturer-supported foundation methods) as part of the manufacturer's system offering.

2.7 PV SYSTEM MONITORING

A. Provide a PV system monitoring panel mounted as indicated.

B. The following quantities must be viewable from a web-based screen display:

1. DC Input Voltage.
2. DC Input Power.
3. DC Input Current.
4. AC Phase Current.
5. AC Voltage.
6. AC Real Power.
7. Cumulative Energy Production on a daily, weekly, monthly, and yearly timeframe.
8. Fault Status Report.
9. DC Ground Current Report.

C. Coordinate PV monitoring communications with the Owner's IT/network requirements. Provide all required gateways, data acquisition devices, and communications interfaces. Provide a connectivity plan identifying whether the system will use Owner network (Ethernet) or cellular, required ports/protocols, and credential handoff procedures. Deliver final monitoring portal credentials and administrative access to Owner at closeout.

2.8 PV SYSTEM METERING

A. Provide a non-revenue-grade Interval Data Recording (IDR) meter complete with industry standard telemetry for communications with Ethernet, cellular, or other common output capabilities. Conform to CSI requirements and electrical utility requirements.

- B. Connect to a monitoring/data collection recording solar production through time increments applicable to installation and utility standards, with a minimum of 15-minute intervals and 30-day memory.
- C. Meter shall be UL listed and conform to ANSI C12.1.
- D. Measure kWh, demand, instantaneous power, volts, amps, and watts.
- E. Provide UL listed communication and annunciator panel.

PART 3 - EXECUTION

3.1 REBATE

- A. Contractor shall provide full administrative support to facilitate procurement of all incentives required by the Contract Documents, including applicable federal tax credits (or direct pay), State of Illinois incentives (including SRECs/Illinois Shines), and applicable utility rebates (including smart inverter rebates). Contractor shall prepare and submit all required applications, registrations, certificates, and supporting documentation; coordinate with the serving utility and program administrators; schedule and support required inspections/verifications; and provide periodic status updates until incentives are secured or formally denied.

3.2 PERFORMANCE GUARANTEE VERIFICATION AND TRUE-UP

- A. Measurement Basis: PV energy production for the guarantee shall be measured using revenue-grade production metering provided as part of the Project or inverter-reported production totals where a revenue-grade meter is not provided.
- B. Weather Normalization: Actual production shall be normalized to typical meteorological year (TMY) conditions using the same modeling software and loss methodology as the Baseline model.
- C. Annual Reporting: Contractor shall provide an annual performance report within 60 days after each 12-month period following Commercial Operation, including monthly kWh production, total annual production, and comparison to the Baseline.
- D. True-Up Payment: If the weather-normalized production for the two-year period is less than the guaranteed production, Contractor shall pay Owner a true-up equal to:
 - 1. $(\text{Guaranteed kWh} - \text{Actual kWh}) \times \XX / kWh ,
 - a. where $\$xx / \text{kWh}$ shall be the Owner's blended electric energy rate.
- E. Exclusions: The guarantee shall not apply to production losses caused by:
 - 1. force majeure.
 - 2. utility outages or utility-imposed curtailment beyond Contractor control.
 - 3. Owner-directed shutdowns.
 - 4. shading changes introduced after installation by Owner or third parties not under Contractor control.

3.3 EXAMINATION

- A. Verify actual conditions with field measurements prior to ordering any PV system equipment or material to verify that equipment fits in allocated space in, and comply with, minimum required clearances specified in NFPA 70.

- B. Examine all photovoltaic (PV) system equipment and components before installation. Reject all photovoltaic (PV) system equipment and components that are damaged, rusted, or have been subjected to water saturation.
- C. Examine elements and surfaces to receive photovoltaic (PV) system equipment and components for compliance with installation tolerances and other conditions affecting performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.4 INSTALLATION

- A. Comply with NECA 1.
- B. Coordinate layout and installation of photovoltaic system equipment and components with other construction. Maintain required workspace clearances around equipment and required clearances for equipment access doors and panels.
- C. Provide all permanent and temporary shoring, anchoring, and bracing required by the nature of this work to make all parts absolutely stable and rigid, even when such shoring, anchoring, and bracing are not explicitly called for.
- D. Install the solar PV system in accordance with this section, installation drawings, and the printed installation instructions of the manufacturer.
- E. Follow the manufacturer's installation recommendations to ensure no electricity is fed to the grid and that all available disconnects are in the open position and fuses are not installed during wiring operations. Utilize on-site measurements in conjunction with engineering designs to accurately cut wires and layouts before making permanent connections. Locate wires out of the way of windows, doors, openings, and other hazards. Ensure wires are free of snags and sharp edges that have the potential to compromise the wire insulation. Ensure breakers in combiner box are in the off position (or fuses removed) during combiner box wiring. Ensure wires and conduits are not installed as a trip hazard.
- F. Ground mounted structures:
 1. For driven pile, install in accordance with PDCA Specification 103.
 2. For helical pile, install in accordance with the international building code.
 3. Provide walking and vehicle space throughout the PV array to facilitate installation, inspection, and maintenance access to all modules in accordance with NFPA 70 and IEEE C2. Maintain ground clearance around arrays as shown on drawings. Maintain a minimum ground clearance of three ft. below arrays for all site-specific conditions including possible array-shading vegetation, ground/vegetation maintenance, and/or array-shading snowfall.

3.5 WIRING

- A. Furnish and install conductors required to connect incoming and outgoing circuits. Install conductors with conduits, boxes, and terminal cabinets in a totally enclosed installation. Install wiring in accordance with NFPA 70 and Section 26 0519 "Low-Voltage Electrical Power Conductors and Cables".
- B. PV conductors in exposed outdoor PV source/output circuits shall comply with NFPA 70 (NEC) Article 690 wiring methods and shall be sunlight resistant and rated for wet locations. Provide PV Wire (UL 4703), USE-2, or RHW-2/RHH.

3.6 GROUNDING AND BONDING

- A. Provide a complete grounding and bonding system for the PV installation complying with requirements in Section 26 0526 "Grounding and Bonding for Electrical Systems". System to include equipment grounding conductors, bonding jumpers, grounding lugs, and terminations necessary to ensure a continuous, low-impedance fault current path for all PV system equipment and metallic components.
 - 1. Bond all exposed, non-current-carrying metal parts associated with the PV system, including (as applicable): PV module frames, racking/rails, mounting hardware, raceways, junction boxes, combiner boxes, disconnects, inverters, equipment enclosures, and support structures.
 - 2. Grounding and bonding shall be installed in accordance with the manufacturer's installation instructions and the requirements of the Contract Documents and the AHJ-adopted electrical code.

- B. Equipment Grounding Conductors and Bonding
 - 1. Provide equipment grounding conductors (EGCs) sized and installed in accordance with the electrical code. EGCs shall be routed with the associated PV circuit conductors where practical and terminated with listed lugs/fittings suitable for the conductor material and environment.
 - 2. Provide bonding jumpers across discontinuities in metallic paths as required (e.g., across rail splices, between separate rail sections, between equipment enclosures, and around nonconductive breaks) to maintain electrical continuity.
 - 3. Provide bonding of module frames to the racking/rail system using manufacturer-approved bonding hardware; do not rely on incidental contact for bonding.
 - 4. Provide bonding of metallic raceways and cable tray systems in accordance with code; ensure continuity across couplings, fittings, and expansion joints as required.
 - 5. Provide grounding lugs for aluminum PV solar module frames of either stainless steel or tin-coated copper. Install grounding lugs in locations on the solar PV module as designated by the module manufacturer, using stainless steel machine screws of the thread size provided in the pre-tapped holes, along with a stainless-steel star washer placed between the grounding lug and the solar module frame.

- C. Interface to Building Grounding Electrode System
 - 1. Connect the PV system grounding and bonding system to the facility grounding system at the point(s) indicated on the Drawings (typically at the service equipment, distribution equipment, or grounding bus as applicable).
 - 2. Where supplemental grounding electrodes are installed (ground-mount sites or as otherwise indicated), coordinate with the facility grounding system. Supplemental electrodes shall not be used as a substitute for required equipment grounding conductors.

- D. Ground-Fault Protection and DC System Grounding
 - 1. Provide ground-fault protection and DC system grounding configuration consistent with the inverter/manufacturer design and the Contract Documents.
 - 2. Where the system includes a grounded DC conductor, provide required identification, routing, and terminations consistent with the equipment design and code requirements

3.7 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components complying with requirements in Section 26 0553 "Identification for Electrical Systems."

- B. Equipment Nameplates: Label PV system equipment with an engraved nameplate complying with requirements for identification specified in Section 26 0553 "Identification for Electrical Systems." Equipment to be equipped with nameplates:
 - 1. Inverters.
 - 2. Combiner boxes.
 - 3. DC and AC disconnect switches.
 - 4. Meters.
 - 5. Service equipment.
 - 6. Combiner panelboards.
- C. Warning Labels: Provide PV equipment with UL 969 weather-resistant marking and warning labels complying with requirements in Section 26 0553 "Identification for Electrical Systems", NFPA 1 and NFPA 70. Equipment to be equipped with warning labels (not limited to):
 - 1. PV system disconnecting means.
 - 2. DC junction boxes.
 - 3. System points with dual power supplies.
- D. Provide warning signs for arc flash protection in accordance with section 26 0573.19 "Arc-Flash Hazard Analysis" and NFPA 70E for all electrical equipment and components that are requiring examination, adjustment, servicing, or maintenance while energized.

3.8 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Documentation and Pre-Start Verification
 - 1. Verify installed equipment matches approved submittals (module/inverter models and ratings, racking type, disconnects, combiners, meters, monitoring gateway).
 - 2. Verify labeling/placards and equipment identification are complete and accurate per Contract Documents.
 - 3. Verify as-built one-line diagram and PV layout drawings reflect installed conditions.
- C. Visual / Mechanical Inspection
 - 1. Inspect modules, racking, and attachments for damage, missing hardware, proper clamp placement, and proper torqueing per manufacturer requirements.
 - 2. Verify conductor management: conductors supported, protected from abrasion, not in contact with grade, and installed in approved wiring methods.
 - 3. Verify all enclosures are weather-tight, fittings are secure, and penetrations are sealed.
 - 4. Verify equipment working clearances and access pathways are maintained.
- D. DC-Side Electrical Checks and Tests
 - 1. Verify polarity and string configuration against design stringing.
 - 2. Measure and record open-circuit voltage (Voc) and short-circuit current (Isc) for each string (or each input where strings are paralleled) and compare to expected values based on module nameplate and site conditions.
 - 3. Perform and record insulation resistance testing of DC circuits to verify no ground-fault/insulation degradation is present (test method and pass/fail criteria per equipment manufacturer and code).
 - 4. Verify continuity of equipment grounding/bonding path for array and DC equipment.
- E. AC-Side Electrical Checks and Tests
 - 1. Verify AC conductor terminations, phasing (where applicable), and OCPD ratings.

2. Measure and record AC voltage/current at inverter output and at point of interconnection (POI) under operating conditions, and confirm values are within equipment ratings.
3. Verify anti-islanding functionality as part of inverter commissioning (via manufacturer procedure and/or utility/AHJ acceptance method).

F. Functional Tests – Safety and Shutdown

1. Verify operation of AC and DC disconnecting means (where provided) and confirm appropriate shutdown sequence.
2. Verify rapid shutdown / PV hazard control operation (when required): demonstrate that activation of the rapid shutdown initiator places the system into rapid shutdown mode and that required equipment state/indication is achieved.
3. Verify ground-fault detection/protection indications and alarm reporting per inverter/system design.

G. Inverter Startup and Commissioning

1. Start up and commission inverter(s) per manufacturer instructions.
2. Verify required grid-interactive settings (as required by utility interconnection approval) are applied and documented.
3. Record startup date/time, firmware version (if applicable), and any warnings/alarms; correct deficiencies and retest.

H. Monitoring / Data Acquisition Verification

1. Verify monitoring gateway and communications are operational and reporting.
2. Verify monitoring displays real-time power, energy, inverter status, and alarms/faults; verify correct system size and site labeling in the monitoring portal.
3. Where revenue-grade or production metering is provided, verify meter operation and CT orientation.

I. Performance Verification

1. On the day of acceptance testing, record available environmental conditions (at minimum: ambient temperature and sky conditions; irradiance if instrumentation is available).
2. Compare measured operating power/energy against expected values from the Contractor's performance model for the conditions observed (allowing for reasonable tolerances and commissioning-stage variability).
3. Identify anomalies, corrective actions taken, and final measured results.

J. Acceptance Test Report (Submit)

1. Submit an acceptance test report including checklist of inspections, all measured electrical test values (Voc/Isc by string, insulation resistance results, AC readings), inverter commissioning record, rapid shutdown functional test record, monitoring verification screenshots/printouts, updated as-builts, and a summary statement confirming system is complete and ready for Owner operation.

- K. Photovoltaic system and associated components will be considered defective if they do not pass tests and inspections.

3.9 DEMONSTRATION

- A. Upon completion of the Work and at a time approved by the Owner/Owner's Representative, provide on-site demonstration and instruction by a qualified instructor covering proper system

operation, adjustment, troubleshooting, and routine maintenance of the PV system and associated equipment, including pertinent safety requirements.

- B. Provide a separate demonstration/training session for the PV monitoring/portal system, including navigation, alarms/fault interpretation, report generation, and basic administrative functions.
- C. Training Requirements
 - 1. Provide training for the installed PV system equipment and monitoring platform. Training content shall be comparable to the equipment manufacturer's standard operational training for end users.
 - 2. Safety training shall address applicable requirements for electrical safe work practices and hazard awareness relevant to PV systems.
- D. Training Schedule, Duration, and Attendees
 - 1. Provide a minimum of two hours of training during normal working hours. Conduct training after the PV system is functionally complete and operational, and prior to final acceptance.
 - 2. Training attendees shall include Owner facilities/maintenance staff and other Owner-designated personnel responsible for operations, maintenance, and safety.
- E. Training Content: Provide training that includes at minimum:
 - 1. System overview: system configuration, major components, operating modes, and normal operating indicators.
 - 2. Start/stop and shutdown: normal shutdown procedures, emergency shutdown, and rapid shutdown / hazard control operation (where applicable), including location of initiating devices and disconnecting means.
 - 3. Electrical and safety: hazards of energized PV equipment, and safe approach/lockout considerations.
 - 4. Monitoring system training (separate session): portal access, live power/energy views, alarms, performance reports, export/download of data, and basic troubleshooting steps.
 - 5. Routine maintenance: recommended inspection intervals, cleaning guidance (if applicable), torque recheck guidance (if applicable), and identifying common issues (loose connectors, damaged conductors, soiling, shading changes).
 - 6. Troubleshooting: interpreting alarms, common fault conditions, and basic diagnostic steps before escalating to service.
 - 7. Warranty/service process (overview): who to contact for service, required information to provide (serial numbers, screenshots, alarms), and typical response workflow.

END OF SECTION 26 2416