TOTH & ASSOCIATES
417.888.0645
tothassociates.com
1550 E Republic Road
Springfield, MO 65804

April 10, 2025

Re: Marshall Municipal Utilities
Miami 1 Substation Rebuild: Request for Proposal – Switchgear – Bid Number: 13-25-ED

Dear Bidder,

You are invited to submit a proposal to supply switchgear and enclosure as specified in the documents contained herein for the referenced project. Please complete the proposal and submit a separate copy to both the Owner and the Engineer at the following addresses:

Owner/Purchaser:	Engineer:
Mr. Doug Root, Director of Electric Distribution	Mr. Zachary R. Marsden, P.E.
Marshall Municipal Utilities	Toth & Associates, Inc.
75 E. Morgan Street	1550 E. Republic Road
Marshall, MO 65340	Springfield, MO 65804
droot@mmumo.net	zmarsden@tothassociates.com
Phone: (660) 886-6966	Phone: (417) 888-0645

Proposals must arrive before 1:30-pm Central Time, Thursday May 8, 2025. . Proposals are to be delivered in a sealed envelope marked: "Miami 1 Substation Rebuild – Switchgear Proposal, Bid Number 13-25-ED". Proposals will be publicly opened.

A complete proposal will include:

- Contract Form RUS 198, completed (pages 4, 5, 8, 10) and signed by the bidder
- Bid Bond Form RUS 307, completed and signed by the bidder
- Switchgear Supplement, completed and signed by the bidder
- Certification Regarding Debarment, completed and signed by the bidder
- Lobbying Certification, completed and signed by the bidder

Please contact me should you have any questions.

Sincerely,

Zachary R. Marsden, P.E.
ZRM/elb

Marshall Municipal Utilities

Marshall, Missouri

Specifications & Materialman's Proposal
for

Miami 1 Substation Rebuild

SWITCHGEAR
Bid Number: 13-25-ED

ISSUED FOR BID: April 2025

Purchase Order _____

Value of Purchase Order _____

Supplier _____

Manufacturer _____

Delivery _____

TOTH & ASSOCIATES

417.888.0645
tothassociates.com
1550 E Republic Road
Springfield, MO 65804

MO COA # - E-2004004242

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Miami 1 Substation Rebuild

Switchgear

RUS Form 198

(modified)

EQUIPMENT CONTRACT

NOTICE AND INSTRUCTIONS TO BIDDERS

1. **Sealed proposals** *for the furnishing and delivering* f.o.b. destination near Marshall, Missouri of equipment for the electric project of Marshall Municipal Utilities *(hereinafter called the "Owner") will be received by the Owner on or before* 1:00 *o'clock* P.*M.,* May 8th Central Time *, 20* 25 *, at its office at* 75 E Morgan Street, Marshall, MO 65340 *at which time and place the proposals will be*

   X *publicly opened and read.*

   _____*privately opened.*

   The Owner, subsequent to the bid opening, may elect to conduct clarifying discussions with the bidder to resolve any questions related to the substance of the bidder's proposal and to arrive at a final price for a responsive bid.

   Any proposals received subsequent to the time specified will be promptly returned to the Bidder unopened.

2. **Obtaining Documents.** *The plans, Specifications, and Constructin Drawings, together with all necessary forms and other documents for bidders may be obtained from the Owner, or from the Engineer Toth & Associates, Inc at the latter's office at 1550 E Republic Rd, Springfield MO 65804 upon the payment of $0.00, which payment will not be subject to refund. The Plans, Specifications, and Construction Drawings may be examined at the office of the Owner or at the office of the Engineer.*

3. **Manner of Submitting Proposals.** *Proposals and all supporting instruments must be submitted on the forms furnished by the Owner and must be delivered in a sealed envelope addressed to the Owner. The name and address of the Bidder and the date and hour of the opening of bids must appear on the envelope in which the Proposal is submitted. Proposals must be completed in ink or typewritten. No alterations or interlineations will be permitted, unless made before submission, and initialed and dated. The successful Bidder will be required to execute two additional counterparts of the Proposal.*

4. **Due Diligence.** *Prior to the submission of the Proposal, the Bidder shall make and shall be deemed to have made a careful examination of the Plans, Specifications, Construction Drawings, and form of Proposal, and shall review the location and nature of the proposed construction, the transportation facilities, the kind and character of soil and terrain to be encountered, the kind of facilities required before and during the construction of the project, general local conditions, environmental and historic preservation considerations, and all other matters that may affect the cost and time of completion of the work. Bidder will be required to comply with all federal, state, and local laws, rules, and regulations applicable to its performance, including those pertaining to the licensing of contractors, and the Anti Kick-Back Act of 1986 (41 U.S.C. 51 et seq).*

5. **Proposals** *will be accepted only from those prequalified bidders invited by the Owner to submit a proposal.*

6. **The Time for Delivery of the Equipment** *is of the essence of the Contract and shall be as specified by the Engineer in the Proposal.*

7. **Evaluation Factors.** *In estimating the lowest cost to the Owner as one of the factors in deciding the award of the Contract, the Owner will consider, in addition to the price quoted in the Proposals, the following:*
   Delivery Schedule
   Manufacturer's Experience
   Terms and Conditions Proposed by Manufacturer

8. **Bid Bond.** *Each Proposal must be accompanied by a Bid Bond in the form attached hereto or a certified check on a bank that is a member of the Federal Deposit Insurance Corporation, payable to the order of the Owner, in an amount equal to ten percent (10%) of the maximum bid price. Each Bidder agrees, provided its Proposal*

is one of the three low Proposals, that, by filing its Proposal together with such Bid Bond or check in consideration of the Owner's receiving and considering such Proposals, said Proposal shall be firm and binding upon each such Bidder and such Bid Bond or check shall be held by the Owner until a Proposal is accepted and a satisfactory Contractor's Bond is furnished (where required) by the successful Bidder, or for a period not to exceed sixty (60) days from the date hereinbefore set for the opening of Proposals, whichever period shall be the shorter. If such Proposal is not one of the three low Proposals, the Bid Bond or check will be returned in each instance within a period of ten (10) days to the Bidder furnishing same.

9. **Contractor's Bond.** *For a Contract in excess of $100,000, the Bidder agrees to furnish a Contractor's Bond in triplicate in the form attached hereto with sureties listed by the United States Treasury Department as Acceptable Sureties, in a penal sum not less than the contract price.*

10. **Failure to Furnish Contractor's Bond.** *Should the successful Bidder fail or refuse to execute such counterparts or to furnish a Contractor's Bond (where required) within ten (10) days after written notification of the acceptance of the Proposal by the Owner, the Bidder will be considered to have abandoned the Proposal. In such event, the Owner shall be entitled (a) to enforce the Bid Bond in accordance with its terms, or (b) if a certified check has been delivered with the Proposal, to retain from the proceeds of the certified check, the difference (not exceeding the amount of the certified check) between the amount of the Proposal and such larger amount for which the Owner may in good faith contract with another party to construct the project. The term "Successful Bidder" shall be deemed to include any Bidder whose Proposal is accepted after another Bidder has previously refused or has been unable to execute the counterparts or to furnish a satisfactory Contractor's Bond (where required).*

11. **Debarment Certification.** *The bidder must provide to the Owner a suspension and debarment certificate in the form attached hereto.*

12. **Contract is Entire Agreement.** *The Contract to be effected by the acceptance of the Proposal shall be deemed to include the entire agreement between the parties thereto, and the Bidder shall not claim any modifications thereof resulting from any representation or promise made at any time by any officer, agent or employee of the Owner or by any other person.*

13. **Minor Irregularities.** *The Owner reserves the right to waive minor irregularities or minor errors in any Proposal, if it appears to the Owner that such irregularities or errors were made through inadvertence. Any such irregularities or errors so waived must be corrected on the Proposal in which they occur prior to the acceptance thereof by the Owner.*

14. **Bid Rejection.** *The Owner reserves the right to reject any or all Proposals.*

15. **Definition of Terms.** *The terms "Administrator" and "Engineer" as used through this Contract shall be as defined in Article VI, Section 1, of the Proposal.*

Marshall Municipal Utilities
Owner

by Mr. Doug Root

Dir. of Elect. Dist.
Title

April *, 20* 25

PROPOSAL

TO:

Marshall Municipal Utilities, 75 E. Morgan Street, Marshall, MO 65340

(hereinafter called the "Owner").

ARTICLE I--GENERAL

Section 1. **Offer to Furnish and Deliver.** *The undersigned (hereinafter called the "Bidder") hereby proposes to furnish and deliver the equipment (hereinafter called the "Equipment") described in the Plans, Specifications, and Construction Drawings for the following prices:*

Item: Switchgear Price: _____

The prices of Equipment set forth herein shall include the cost of delivery to:

See attached Vicinity Map

The prices set forth herein do not include any sums which are or may be payable by the Bidder on account of taxes imposed by any taxing authority upon the sale, purchase or use of the Equipment. If any such tax is applicable to the sale, purchase or use of the Equipment hereunder, the amount thereof shall be added to the purchase price and paid by the Owner.

Section 2. **Materials and Equipment.** *The Bidder agrees to furnish and use in the construction of the project under this Proposal, in the event the Proposal is accepted, only such "fully accepted," "conditionally accepted," and "technically accepted" materials and equipment which have been accepted by RUS as indicated in the current RUS Informational Publication 202-1, "List of Materials Acceptable for Use on Systems of RUS Electrification Borrowers," including revisions adopted prior to the Bid Opening. The use of "conditionally accepted" or "technically accepted" materials and equipment requires prior consent by the Owner or Engineer.*

The Bidder will purchase all materials and equipment outright and not subject to any conditional sales agreements, bailment, lease or other agreement reserving unto the seller any right, title or interest therein. All such materials and equipment shall be new.

Section 3. **Description of Contract.** *The Notice and Instructions to Bidders, Plans, Specifications, and Construction Drawings, which by this reference are incorporated herein, together with the Proposal and Acceptance constitute the Contract. The Plans, Specifications, and Construction Drawings, including maps, special drawings, and approved modifications in standard specifications are attached hereto and identified as follows:*

Exhibit C (Contract Forms); Exhibit D (Construction Specifications); Exhibit E (Drawings); Exhibit F (Switchgear Supplement); Exhibit G (Vicinity Map)

Section 4. **Due Diligence.** *The Bidder has made a careful examination of the Plans, Specifications, and Construction Drawings attached hereto, and has become informed as to the location and nature of the proposed construction, the transportation facilities, the kind and character of soil and terrain to be encountered, and the kind of facilities required before and during the construction of the project, and has become acquainted with the labor conditions, federal, state, and local laws, rules, and regulations applicable to its performance.*

Section 5. License. *The Bidder warrants that a Contractor's License is ___ , is not ___ required, and if required, it possesses Contractor's License No. _____ for the State of _____ in which the project is located and said license expires on _____ , 20 _____ .*

Section 6. Warranty of Good Faith. *The Bidder warrants that this Proposal is made in good faith and without collusion or connection with any person or persons bidding for the same work.*

ARTICLE II--DELIVERY AND WARRANTY

Section 1. Delivery. *The Bidder shall deliver the Equipment:*

* *within* * *days after receipt of the written order or orders of the Owner.*

X *not later than* August 31 *, 20* 26 .

The time for delivery shall be extended for the period of any reasonable delay due exclusively to causes beyond the control and without the fault of the Bidder, including, but not limited to, acts of God, fires, strikes, and floods.

Section 2. Defective Materials and Workmanship.

a. *All Equipment furnished hereunder shall be subject to the inspection, tests, and approval of the Owner, and the Bidder shall furnish all information required concerning the nature or source of any Equipment and provide adequate facilities for testing and inspecting the Equipment at the plant of the Bidder.*

b. *The Equipment furnished hereunder shall become the property of the Owner upon delivery, provided, however, that the Owner, within one year after initial operation of the Equipment, or within the period for which the Equipment is guaranteed, whichever is longer, may reject any Equipment which does not comply with the Specifications attached hereto and made a part hereof or with the guarantees, if any, of the Bidder and the manufacturer. Upon any such rejection, the Bidder shall repair or replace such defective Equipment within a reasonable time after notice in writing from the Owner. If any such defective materials, equipment, or workmanship so replaced or repaired is found to be defective within one year after the completion of the replacement or repair, the Bidder shall replace or remedy such defective materials , equipment, or workmanship. In the event of failure by the Bidder so to do, the Owner may make such replacement and the cost and expense thereof shall be paid by and recoverable from the Bidder.*

c. *All manufacturers' guarantees of Equipment, if any, shall be transferred and assigned to the Owner upon delivery of any Equipment and before final payment is made for such Equipment. Such guarantees shall be in addition to those required of the Bidder by other provisions of this Contract.*

ARTICLE III--PAYMENT

Section 1. Payments to Bidder.

a. *Upon the shipment of any Equipment hereunder, the Bidder shall submit to the Owner a detailed statement of the Equipment shipped. The Owner shall, upon receipt of the Equipment, pay the Bidder ninety percent (90%) of the contract price of the Quipment. When the Equipment has been installed, placed in satisfactory operation, tested and accepted by the Owner, the Owner shall make final payments therefore to the Bidder; provided, however, such final payment shall be made not later than* 90 *days after delivery of all Equipment plus installation and field services and receipt of Bidder's Statement as described above , unless such acceptance by the Owner shall be withheld because of the fault of the Bidder.*

b. No payment shall be due while the Bidder is in default in respect of any of the provisions of this Contract and the Owner may withhold from the Bidder the amount of any claim by a third party against either the Bidder or the Owner based upon an alleged failure of the Bidder to perform the work hereunder in accordance with the provisions of this Contract.

ARTICLE IV--PARTICULAR UNDERTAKINGS OF THE BIDDER

The provisions of this Article IV apply to any work performed by the Bidder at the project site.

Section 1. Protection to Persons and Property. *The Bidder shall at all times take all reasonable precautions for the safety of employees on the project and of the public, and shall comply with all applicable provisions of federal, state, and local laws, rules, and regulations and building and construction codes, in addition to the safety rules and procedures of the Owner.*

The following provisions shall not limit the generality of the above requirements:

a. The Bidder shall at no time and under no circumstances cause or permit any employee of the Bidder to perform any work upon energized lines, or upon poles carrying energized lines, unless otherwise specified in the Notice and Instructions to Bidders.

b. The Bidder shall transport and store all material in facilities and vehicles which are designed to protect the material from damage. The Bidder shall ensure that all vehicles, trailers, and other equipment used comply with all applicable licensing, traffic, and highway requirements.

c. The Bidder shall conduct its operations to cause the least possible obstruction of public highways.

d. The Bidder shall make good and fully repair all injuries and damages to the project or any portion thereof under the control of the Bidder by reason of any act of God or other casualty or cause whether or not the same shall have occurred by reason of the Bidder's negligence.

(i) To the maximum extent permitted by law, Bidder shall defend, indemnify, and hold harmless Owner and Owner's directors, officers, and employees from all claims, causes of action, losses, liabilities, and expenses (including reasonable attorney's fees) for personal loss, injury, or death to persons (including but not limited to Bidder's employees) and loss, damage to or destruction of Owner's property or the property of any other person or entity (including but not limited to Bidder's property) in any manner arising out of or connected with the Contract, or the materials or equipment supplied or services performed by Bidder, its subcontractors and suppliers of any tier. But nothing herein shall be construed as making Bidder liable for any injury, death, loss, damage, or destruction caused by the sole negligence of Owner.

(ii) To the maximum extent permitted by law, Bidder shall defend, indemnify, and hold harmless Owner and Owner's directors, officers, and employees from all liens and claims filed or asserted against Owner, its directors, officers, and employees, or Owner's property or facilities, for services performed or materials or equipment furnished by Bidder, its subcontractors and suppliers of any tier, and from all losses, demands, and causes of action arising out of any such lien or claim. Bidder shall promptly discharge or remove any such lien or claim by bonding, payment, or otherwise and shall notify Owner promptly when it has done so. If Bidder does not cause such lien or claim to be discharged or released by payment, bonding, or otherwise, Owner shall have the right (but shall not be obligated) to pay all sums necessary to obtain any such discharge or release and to deduct all amounts so paid from the amount due Bidder.

(iii) Bidder shall provide to Owner's satisfaction evidence of Bidder's ability to comply with the indemnification provisions of subparagraphs I and ii above, which evidence may include by may not be limited to a bond or liability insurance policy obtained for this purpose through a licensed surety or insurance company.

e. Upon violation by the Bidder of any of the provisions of this section, after written notice of such violation given to the Bidder by the Owner, the Bidder shall immediately correct such violation. Upon failure of the Bidder so to do the Owner may correct such violation at the Bidder's expense: Provided, however, that the Owner may, if it deems it necessary or advisable, correct such violation at the Bidder's expense without such prior notice to the Bidder.

Section 2. **Insurance.** *The Bidder shall take out and maintain throughout the period of its operations at the project site the types and minimum amounts of insurance as specified in Exhibit A:*

ARTICLE V--REMEDIES

Section 1. **Liquidated Damages.** *The time of the delivery of the Equipment is of the essence of the Contract. Should the Bidder neglect, refuse or fail to deliver the Equipment within the time herein agreed upon, after giving effect to extensions of time, if any, herein provided, then, in that event and in view of the difficulty of estimating with exactness damages caused by such delay, the Owner shall have the right to deduct from and retain out of such moneys which may be then due, or which may become due and*

payable to the Bidder the sum of One Thousand *dollars (* $1,000.00 *) per day for each and every day that such delivery is delayed beyond the specified time, as liquidated damages and not as a penalty; if the amount due and to become due from the Owner to the Bidder is insufficient to pay in full any such liquidated damages, the Bidder shall pay to the Owner the amount necessary to effect such payment in full: Provided, however, that the Owner shall promptly notify the Bidder in writing of the manner in which the amount retained, deducted or claimed as liquidated damages was computed.*

Section 2. **General.** *If either party to this Agreement shall institute any action or proceeding against the other party to enforce its rights and remedies herein, the prevailing party shall be entitled to recover from the other party reasonable attorneys' fees and expenses. As used herein, "prevailing party" shall mean, in the case of claimant, one who is successful in obtaining substantially all of the relief sought, and in the case of a defendant or respondent, one who is successful in denying substantially all of the relief sought. Otherwise each party hereto shall pay the fees and disbursements of its own attorneys, accountants, investment advisers and other professionals.*

Section 3. **Cumulative Remedies.** *Every right or remedy herein conferred upon or reserved to the Owner or the Government shall be cumulative, shall be in addition to every right and remedy now or hereafter existing at law or in equity or by statute and the pursuit of any right or remedy shall not be construed as an election: Provided, however, that the provisions of Section 1 of this Article shall be the exclusive measure of damages for failure by the Bidder to deliver the Equipment within the time herein agreed upon.*

ARTICLE VI--MISCELLANEOUS

Section 1. **Definitions.**

a. The term ''Administrator'' shall mean the Administrator of the Rural Utilities Service of the United States of America and his or her duly authorized representative or any other person in whom or authority in which may be vested the duties and functions which the Administrator is now authorized by law to perform.

b. The term ''Engineer'' shall mean the Engineer employed by the Owner, to provide engineering services for the project and said Engineer's duly authorized assistants and representatives.

Section 2. **Materials and Supplies**. *In the performance of this contract there shall be furnished only such unmanufactured articles, materials, and supplies as have been mined or produced in the United States or in any eligible country, and only such manufactured articles, materials, and supplies as have been manufactured in the United States or in any eligible country substantially all from articles, materials, or supplies mined, produced or manufactured, as the case may be, in the United States or in any eligible country ; provided that other articles, materials, or supplies may be used in the event and to*

the extent that the Administrator shall expressly in writing authorize such use pursuant to the provisions of the Rural Electrication Act of 1938, being Title IV of Public Resolution No. 122, 75th Congress, approved June 21, 1938. For the purposes of this section, an ''eligible'' country'' is any country that applies with respect to the United States an agreement ensuring reciprocal access for United States products and services and suppliers to the markets of that country, as determined by the United States Trade Representative. The Bidder agress to submit to the Owner such certificates with respect to compliance with the foregoing provision as the Administrator from time to time may require.

Section 3. Patent Infringement. *The Bidder shall hold harmless and indemnify the Owner from any and all claims, suits and proceedings for the infringement of any patent or patents covering Equipment purchased hereunder.*

Section 4. Compliance with Laws. *The Bidder shall comply with all federal, state, and local laws, rules, and regulations applicable to its performance under the contract and the construction of the project. The Bidder acknowledges that it is familiar with the Rural Electrication Act of 1936, as amended, the Anti Kick-Back Act of 1986 (41 U.S.C. 51 et seq), and 18 U.S.C. SS286, 287, 641, 661, 874, 1001, and 1366, as amended.*

The Bidder represents that to the extent required by Executive Orders 12549 (3 CFR, 1985-1988 Comp., p. 189) and 12689 (3 CFR, 1989 Comp, p. 235), Debarment and Suspension, and 7 CFR part 3017, it has submitted to the Owner a duly executed certification in the form prescribed in 7 CFR part 3017.

The Bidder represents that, to the extent required, it has complied with the requirements of Pub. L. 101-121, Section 319, 103 Stat.701, 750-765 (31 U.S.C. 1352), entitled "Limitation on use of appropriated funds to influence certain Federal contracting and financial transactions." and any rules and regulations issued pursuant thereto.

Section 5. Equal Opportunity Provisions.

a. Bidder's Representations.

The Bidder represents that:

It has ___, does not have ___, 100 or more employees, and if it has, that it has ___, has not ___, furnished the Equal Employment Opportunity-Employers Information Report EEO-1, Standard Form 100, required of employers with 100 or more employees pursuant to Executive Order 11246 of September 24, 1965, and Title VII of the Civil Rights Act of 1964.

The Bidder agrees that it will obtain, prior to the award of any subcontract for more than $10,000 hereunder to a subcontractor with 100 or more employees, a statement, signed by the proposed subcontractor, that the proposed subcontractor has filed a current report on Standard Form 100.

The Bidder agrees that if it has 100 or more employees and has not submitted a report on Standard Form 100 for the current reporting year and that if this Contract will amount to more than $10,000, the Bidder will file such report, as required by law, and notify the owner in writing of such filing prior to the Owner's acceptance of this Proposal.

b. Equal Opportunity Clause. During the performance of the Contract, the Bidder agrees as follows:

(1) The Bidder will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Bidder will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotions or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection of training, including apprenticeship. The Bidder agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this Equal Opportunity Clause.

(2) The Bidder will, in all solicitations or advertisements for employees placed by or on behalf of the Bidder, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.

(3) The Bidder will send to each labor union or representative of workers, with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the Bidder's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The Bidder will comply with all provision of Executive Order 11246 of September 24, 1965, and the rules, regulations and relevant orders of the Secretary of Labor.

(5) The Bidder will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the Bidder's noncompliance with the Equal Opportunity Clause of this Contract or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated, or suspended in whole or in part, and the Bidder may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as provided by law.

(7) The Bidder will include this Equal Opportunity Clause in every subcontractor purchase order unless exempted by the rules, regulations, or order of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Bidder will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance; Provided, however, that in the event Bidder becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the Bidder may request the United States to enter into such litigation to protect the interests of the United States.

c. Certificate of Nonsegregated Facilities. The Bidder certifies that it does not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The Bidder certifies further that it will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it will not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The Bidder agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this Contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise. The Bidder agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity Clause, and that it will retain such certifications in its files.

Section 6. Successors and Assigns. *Each and all of the covenants and agreements herein contained shall extend to and be binding upon the successors and assigns of the parties hereto.*

Section 7. **Independent Contractor.** *The Bidder shall perform the work as an independent contractor, not as a subcontractor, agent, or employee of the Owner. Upon acceptance of this Proposal, the successful Bidder shall be the Contractor and all references in the Proposal to the Bidder shall apply to the Contractor.*

Section 8. **Approval by the Administrator:** *This contract does ____, does not _X_, require approval of the Administrator. No acceptance of a Proposal for a contract upon which approval of the Administrator is required shall become effective until the contract has been approved by the Administrator; provided that no obligation shall arise hereunder unless such approval is given within one-hundred twenty (120) days after the date set for the opening of the proposals. The acceptance of a Proposal for a contract upon which approval of the Administrator is not required shall become effective the date of acceptance by the Owner.*

PROPOSAL SIGNATURE SHEET (BIDDER)

Attest

_____
Bidder

_____
Secretary

_____
President

Dated _____

_____
Address

The Proposal must be signed with the full name of the Bidder. If the Bidder is a partnership, the Proposal must be signed in the partnership name by a partner. If the Bidder is a corporation, the Proposal must be signed in the corporate name by a duly authorized officer and the corporate seal affixed and attested by the Secretary of the Corporation.

ACCEPTANCE

The Owner hereby accepts the foregoing Proposal of the Bidder, _____

_____

_____ *for the following Equipment:*

Miami 1 Substation: Switchgear

for a total contract price of $ _____ (_____ *dollars.)*

Marshall Municipal Utilities

Owner

by _____

_____

Secretary

_____ *, 20* 25

Date of Contract

Exhibit A:

Insurance Requirements

EXHIBIT A:

INSURANCE REQUIREMENTS

1. *The Bidder shall take out and maintain throughout the period of this Agreement the following types and minimum amounts of insurance:*

    a. *Workers' compensation and employers' liability insurance, as required by law, covering all its employees who perform any of the obligations of the Bidder under the contract. If any employer or employee is not subject to the workers' compensation laws of the governing state, then insurance shall be obtained voluntarily to extend to the employer and employee coverage to the same extent as though the employer or employee were subject to the workers' compensation laws.*

    b. *Public liability insurance covering all operations under the contract shall have limits for bodily injury or death of not less than $1 million each occurrence, limits for property damage of not less than $1 million each occurrence, and $2 million aggregate for accidents during the policy period. A single limit of $1 million of bodily injury and property damage is acceptable. This required insurance may be in a policy or policies of insurance, primary and excess including the umbrella or catastrophe form.*

    c. *Automobile liability insurance on all motor vehicles used in connection with the contract, whether owned, nonowned, leased or hired, shall have limits for bodily injury or death of not less than $1 million per person and $1 million each occurrence, and property damage limits of $1 million for each occurrence. This required insurance may be in a policy or policies of insurance, primary and excess including the umbrella or catastrophe form.*

    d. *Builders' Risk and/or Installation Floater with limits not less than the total contracted value of the project. The completed value of the project shall provide for Contractor's labor, equipment, materials (including Owner Furnished Materials), and fixtures to be installed, in-transit, or stored off-site during the performance of this Contract. The policy shall include as loss payee the Owner, the Engineer, the Contractor and its subcontractors as their interest may appear.*

    e. *Each subcontractor shall have as a minimum the same amounts of insurance shown in parts "a", "b" and "c" above unless otherwise approved by the Owner. Each subcontractor may also be required to provide the Builders' Risk and/or Installation Floater described in part "d" if the Owner or Engineer deems it necessary. All insurance shall be paid for by each subcontractor prior to beginning any work on this project.*

2. *The cost of all insurance for this project shall be covered in the Bidder's proposal price.*

3. *Evidence of all insurance must be provided to the Engineer prior to construction Commencement Date. The Owner and Engineer shall be supplied a copy of the "Certificate of Insurance" from each subcontractor prior to any work performed by the subcontractor.*

4. *Insurance shall be placed with companies with a minimum Best's rating of at least A:VII and a Standard and Poors Rating (if rated) of at least BBB.*

5. *The Owner or Engineer shall have the right at any time to require public liability insurance and property damage liability insurance greater than those required in subsection "b" and "c" of this Section. In any such event, the additional premium or premiums payable solely as the result of such additional insurance shall be added to the Contract price.*

6. *The Owner and Engineer shall be named as Additional Insured on all policies of insurance required in subsections "b", "c" and "d" of this Section. The Bidder shall be the Named Insured.*

7. *The policies of insurance shall be in such form and issued by such insurer as shall be satisfactory to the Owner. The Bidder shall furnish the Owner and Engineer a certificate evidencing compliance with the foregoing requirements which shall provide not less than (30) days prior written notice to the Owner and Engineer of any cancellation or material change in the insurance.*

INSURANCE SUMMARY (*)					
Project Name:		Miami 1 Substation Rebuild: Switchgear			
Named Insured:		Bidder			
Project Owner:		Marshall Municipal Utilities			
Project Engineer:		Toth and Associates, Inc.			
				Additional Insured	
	item	type	limit	Owner	Engineer
The cost of the following policies shall be covered in the Bidder's proposal price:					
	1.a.	Workers' Comp + Employers' Liability	**	no	no
	1.b.	Public Liability	$ 1,000,000/ $ 2,000,000	yes	yes
	1.c.	Auto Liability	$ 1,000,000	yes	yes
	1.d.	Builders' Risk Installation Floater	Completed value of project	yes	yes
**	as required by Contractor employer/employee's governing state.				

(*) THIS SUMMARY CHECKLIST IS PROVIDED AS AN AID IN DETERMINING THE INSURANCE REQUIREMENTS DEFINED. USE OF THIS CHART DOES NOT RELIEVE THE CONTRACTOR AND/OR INSURER FROM REVIEW, UNDERSTANDING, AND COMPLIANCE WITH ALL OF THE INSURANCE REQUIREMENTS CONTAINED HEREIN.

SUBMIT INSURANCE TO: **TOTH & ASSOCIATES, INC.**
1550 E. Republic Road
SPRINGFIELD, MO 65804

Exhibit B:

Addendums – Intentionally Blank

Exhibit C:

Contract Forms

EXHIBIT C:

CONTRACT FORMS

Agency/Form No.	Form Title/Description
RUS Form 168b	Contractor's Bond
RUS Form 307	Bid Bond
OSHA	OSHA Information Transfer Addendum
	Certificate Regarding Debarment
	Lobbying Certification
TOTH	Contractor's Request for Information Form
MO Division of Labor	Annual Wage Order 31
MO Division of Labor	Affidavit of Compliance with the Prevailing Wage Law

U.S. Department of Agriculture
Rural Utilities Service

CONTRACTOR'S BOND

1. *Know all persons that we,* _____, *as*

   Principal, and _____ , *as Surety,*

   are held and firmly bound unto Marshall Municipal Utilities *(hereinafter called the "Owner") and unto the United States of America (hereinafter called the "Government") and unto all persons, firms and corporations who or which may furnish materials for or perform labor on a*

   Rural Utilities Service project known as Miami 1 Substation: Switchgear

   and to their successors and assigns, in the penal sum of _____

   dollars ($_____), as hereinafter set forth and for the payment of which sum well and truly to be made we bind ourselves, our executors, administrators, successors and assigns jointly and severally by these presents. Said project is described in a certain construction contract (hereinafter called the

   "Construction Contract") between the Owner and the Principal, dated _____, 20_____, pursuant and subject to a certain loan contract (hereinafter called the "Loan Contract") between the Owner and the Government, acting through the Administrator of the Rural Utilities Service (hereinafter called the "Administrator").

2. *The condition of this obligation is such that if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of the Construction Contract and any amendments thereto, whether such amendments are for additions, decreases, or changes in materials, their quantity, kind or price, labor costs, mileage, routing or any other purpose whatsoever, and whether such amendments are made with or without notice to the Surety, and shall fully indemnify and save harmless the Owner and the Government from all costs and damages which they, or either of them, shall suffer or incur by reason of any failure so to do, and shall fully reimburse and repay the Owner and the Government for all outlay and expense which they, or either of them shall incur in making good any such failure of performance on the part of the Principal, and shall promptly make payment to all persons working on or supplying labor or materials for use in the construction of the project contemplated in the Construction Contract and any amendments thereto, in respect of such labor or materials furnished and used therein, to the full extent thereof, and in respect of such labor or materials furnished but not so used, to the extent of the quantities estimated in the Construction Contract and any amendments thereto to be required for the construction of the project, and shall well and truly reimburse the Owner and the Government, as their respective interests may appear, for any excess in cost of construction of said project over the cost of such construction as provided in the Construction Contract and any amendments thereto, occasioned by any default of the Principal under the Construction Contract and any amendments thereto, then this obligation shall be null and void, but otherwise shall remain in full force and effect.*

3. *It is expressly agreed that this bond shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon any amendment to the Construction Contract, so as to bind the Principal and the Surety to the full and faithful performance of the Construction Contract as so amended, provided only that the total amount of all increases in the cost of construction shall not exceed 20 percent of the amount of the maximum price set forth in the Construction Contract. The term "Amendment," wherever used in this bond, and whether referring to this bond, the Construction Contract or the Loan Contract shall include any alteration, addition, extension, modification, amendment, rescission, waiver, release or annulment, of any character whatsoever.*

4. *It is expressly agreed that any amendment which may be made by agreement or otherwise between the Principal and the Owner in the terms, provisions, covenants and conditions of the Construction Contract, or in the terms, provisions, covenants and conditions of the Loan Contract (including, without limitation, the granting by the Administrator to the Owner of any extension of time for the performance of the obligations of*

the Owner under the Loan Contract or the granting by the Administrator or the Owner to the Principal of any extension of time for the performance of the obligations of the Principal under the Construction Contract, or the failure or refusal of the Administrator or the Owner to take any action, proceeding or step to enforce any remedy or exercise any right under either the Construction Contract or the Loan Contract, or the taking of any action, proceeding or step by the Administrator or the Owner, acting in good faith upon the belief that the same is permitted by the provisions of the Construction Contract or the Loan Contract) shall not in any way release the Principal and the Surety, or either of them or their respective executors, administrators, successors or assigns, from liability hereunder. The Surety hereby acknowledges receipt of notice of any amendment, indulgence or forbearance, made, granted or permitted.

5. *This bond is made for the benefit of all persons, firms and corporations who or which may furnish any materials or perform any labor for or on account of the construction to be performed under the Construction Contract and any amendments thereto, and they, and each of them, are hereby made obligees hereunder with the same force and effect as if their names were written herein as such, and they and each of them may sue hereon.*

In witness whereof, the undersigned have caused this instrument to be executed and their respective corporate seals to be affixed and attested by their duly authorized representatives this

_____ *day of* _____ *, 20_____ .*

_____ *(Seal)*
Principal

ATTEST: *By* _____

_____ _____
Secretary

_____ *(Seal)*
Surety

ATTEST: *By* _____

_____ _____
Secretary

_____
Address of Surety's Home Office

By _____
Resident Agent of Surety

_____

Signatures: *The Contractor's Bond must be signed with the full name of the Contractor. If the Contractor is a partnership the Contractor's Bond must be signed in the partnership name by a partner. If the Contractor is a corporation the Contractor's Bond must be signed in the corporate name by a duly authorized officer and the corporate seal affixed and attested by the Secretary of the corporation. A typewritten copy of all such names and signatures shall be appended.*

Power of Attorney: *The Contractor's Bond must be accompanied by a power of attorney authorizing execution on behalf of the Surety and, in jurisdictions so requiring should be countersigned by a duly authorized resident agent of the Surety.*

U.S. Department of Agriculture
Rural Utilities Service

BID BOND

1. *KNOW ALL PERSONS that we, _____*

   _____ as Principal, and

   _____ ,

   as Surety, are held and firmly bound unto Marshall Municipal Utilities

   _____ (hereafter called the "Owner") in the penal sum of ten percent (10%) of the amount of the bid referred to in paragraph 2 below, but not to exceed _____ dollars ($ _____), as hereinafter set forth and for the payment of which sum well and truly to be made we bind ourselves, our executors, administrators, successors and assigns, jointly and severally, by these presents;

2. *WHEREAS, the Principal has submitted a bid to the Owner for the construction of the Rural Utilities Service project known as* Miami 1 Substation: Switchgear.

3. *NOW, THEREFORE, the condition of this obligation is such that if the Owner shall accept the bid of the Principal, and*

   a. *the Principal shall execute such contract documents, if any, as may be required by the terms of the bid and give such Contractor's Bond or Bonds for the performance of the contract and for the prompt payment of labor and material furnished for the project as may be specified in the bid, or*

   b. *in the event of the failure of the Principal to execute such contract documents, if any, and give such Contractor's Bond or Bonds, if the Principal shall pay to the Owner the difference, not to exceed the penal sum hereof, between the amount specified in the bid and such larger amount for which the Owner may in good faith contract with another party to construct the project, then this obligation shall be void, otherwise to remain in full force and effect.*

IN WITNESS WHEREOF, the undersigned have caused this instrument to be executed and their respective corporate seals to be affixed and attested by their duly authorized representatives this

_____ *day of* _____ *, 20_____ .

_____ *(Seal)*
Principal

ATTEST: *By* _____

_____ _____
Secretary *Title*

_____ *(Seal)*
Surety

ATTEST: *By* _____

_____ _____
Secretary *Title*

OSHA INFORMATION TRANSFER ADDENDUM

A. Existing Characteristics and Conditions: Characteristics of host employer's installation related to safety of work to be performed, provided from existing records or other source:

i. Nominal voltages of lines and equipment: Attached: ___ Described below: X

161kV/13.2kV

ii. Maximum switching-transient voltages: Attached: ___ Described below: X

170kV/15kV

iii. Presence of hazardous induced voltages: Attached: ___ Described below: X

Unknown.

iv. Presence of protective grounds/equipment grounding conductors: Attached: ___ Described below: X

Station Grounding.

v. Locations of circuits and equipment, supply lines, communication lines, and fire-protective signaling circuits: Attached: ___ Described below: X

Above-grade line present on-site. Below-grade lines present near project location.

B. Additional Characteristics and Conditions: Conditions related to safety of work to be performed by contract employer, if known to host employer, and without worksite inspection:

vi. Condition of protective grounds and equipment grounding conductors: Attached: ___ Described below: X

Unknown.

vii. Condition of poles: Attached: ___ Described below: X

N/A

viii. Environmental conditions relating to safety: Attached: ___ Described below: X

Existing station is energized.

ANY ADDITIONAL existing characteristics or conditions relating to the safety of Contract Employer's Work: Not applicable: X Attached: ___ Described: N/A

C. Design and Operation: Information about design and operation of host employer's installation required by contract employer to make an assessment under 1910.269, provided from host employer's existing records or other source: Attached: ___ Described below: X

N/A

D. Other Requested Information: Information about design or operation of host employer's installation that is known to host employer, requested by contract employer and related to protection of contract employer's employees, provided from host employer's existing records or other source, without host employer's worksite inspection: Attached: ___ Described below: X

N/A

All attachments to this Addendum, including any specified document(s), report(s) or other materials identified above, are incorporated by reference and are part of this completed Addendum. The above information is provided pursuant to 29 CFR 1910.269(a)(3) based on host employer's exercise of reasonable diligence, but is not a comprehensive summary of all safety information or potential hazards. Contract employer is solely responsible for obtaining all applicable safety information other than this Addendum.

Exhibit to: Miami 1 Substation: Switchgear Issued for Bid: January 2025

(Name/Date of Agreement/Bid/Proposal/Other)

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION – LOWER TIER COVERED TRANSACTIONS

INSTRUCTIONS FOR CERTIFICATION

1. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.

2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or had become erroneous by reason of changed circumstances.

4. The terms *covered transaction, debarred, suspended, ineligible, lower tier covered transaction, participant, person, primary covered transaction, principal, proposal, and voluntarily excluded*, as used in this clause, have the meaning set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

5. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transactions with a person who is proposed for debarment under 48 CFR part 9, subpart 9.4, debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

6. The prospective lower tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not proposed for debarment under 48 CFR part 9, subpart 9.4, debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the List of Parties Excluded from Federal Procurement and Nonprocurement Programs.

8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is proposed for debarment under 48 CFR part 9, subpart 9.4, suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

CERTIFICATION

(1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Marshall Municipal Utilities
Miami 1 Substation Rebuild
Switchgear

Organization Name PR/Award or Project Name

Name and Title

Signature Date

LOBBYING CERTIFICATION

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Marshall Municipal Utilities
Miami 1 Substation Rebuild
Switchgear

Organization Name — PR/Award or Project Name

Name and Title

Signature — Date

Contractor's Request for Information (RFI) Form

Technical questions regarding this solicitation should be submitted no later than 5:00 pm local time on May 1, 2025, utilizing this RFI Form. Email completed RFI forms in PDF format to Mr. Zachary Marsden at zmarsden@tothassociates.com or submit by fax to (417) 888-0657. RFIs not submitted in compliance with these instructions may not be acknowledged. Please use a separate form for each inquiry.

Project: Miami 1 Substation Rebuild: Switchgear
Owner: Marshall Municipal Utilities
Bid Due Date: 05/08/2025

TO BE COMPLETED BY CONTRACTOR

Information Requested (include drawing number or specification page number, if applicable):	
Submitted By:	Date:

TO BE COMPLETED BY TOTH & ASSOCIATES

Response:	
Response By:	Date:

Missouri
Division of Labor Standards
WAGE AND HOUR SECTION

MICHAEL L. PARSON, Governor

Annual Wage Order No. 31

Section 101
SALINE COUNTY

In accordance with Section 290.262 RSMo 2000, within thirty (30) days after a certified copy of this Annual Wage Order has been filed with the Secretary of State as indicated below, any person who may be affected by this Annual Wage Order may object by filing an objection in triplicate with the Labor and Industrial Relations Commission, P.O. Box 599, Jefferson City, MO 65102-0599. Such objections must set forth in writing the specific grounds of objection. Each objection shall certify that a copy has been furnished to the Division of Labor Standards, P.O. Box 449, Jefferson City, MO 65102-0449 pursuant to 8 CSR 20-5.010(1). A certified copy of the Annual Wage Order has been filed with the Secretary of State of Missouri.

Original Signed by
Todd Smith, Director
Division of Labor Standards

Filed With Secretary of State: **March 8, 2024**

Last Date Objections May Be Filed: **April 8, 2024**

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	$25.72*
Boilermaker	$25.72*
Bricklayer-Stone Mason	$25.72*
Carpenter	$55.77
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	$25.72*
Plasterer	
Communication Technician	$25.72*
Electrician (Inside Wireman)	$70.91
Electrician Outside Lineman	$25.72*
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	$25.72*
Glazier	$25.72*
Ironworker	$70.10
Laborer	$25.72*
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	$25.72*
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	$25.72*
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	$25.72*
Plumber	$77.69
Pipe Fitter	
Roofer	$25.72*
Sheet Metal Worker	$25.72*
Sprinkler Fitter	$25.72*
Truck Driver	$25.72*
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

*The Division of Labor Standards received fewer than 1,000 reportable hours for this occupational title. The public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.
**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title as defined in RSMo Section 290.210.

Heavy Construction Rates for
SALINE County

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Carpenter	$54.25
Millwright	
Pile Driver	
Electrician (Outside Lineman)	$25.72*
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Laborer	$43.99
General Laborer	
Skilled Laborer	
Operating Engineer	$57.56
Group I	
Group II	
Group III	
Group IV	
Truck Driver	$25.72*
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

Use Heavy Construction Rates on Highway and Heavy construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(3).

Use Building Construction Rates on Building construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(2).

If a worker is performing work on a heavy construction project within an occupational title that is not listed on the Heavy Construction Rate Sheet, use the rate for that occupational title as shown on the Building Construction Rate Sheet.

*The Division of Labor Standards received fewer than 1,000 reportable hours for this occupational title. Public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.

**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title.

OVERTIME
and
HOLIDAYS

OVERTIME

For all work performed on a Sunday or a holiday, not less than twice (2x) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work.

For all overtime work performed, not less than one and one-half (1½) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work or contractual obligation. For purposes of this subdivision, **"overtime work"** shall include work that exceeds ten hours in one day and work in excess of forty hours in one calendar week; and

A thirty-minute lunch period on each calendar day shall be allowed for each worker on a public works project, provided that such time shall not be considered as time worked.

HOLIDAYS

January first;
The last Monday in May;
July fourth;
The first Monday in September;
November eleventh;
The fourth Thursday in November; and
December twenty-fifth;

If any holiday falls on a Sunday, the following Monday shall be considered a holiday.

DIVISION OF LABOR STANDARDS

MISSOURI DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

AFFIDAVIT
COMPLIANCE WITH THE PREVAILING WAGE LAW

I, _____, upon being duly sworn upon my oath state that: (1) I am the
(Name)

_____ of _____; (2) all requirements of
(Title) *(Name of Company)*

§§ 290.210 to 290.340, RSMo, pertaining to the payment of wages to workers employed on public works projects have been fully satisfied with regard to this company's work on _____;
(Name of Project)

(3) I have reviewed and am familiar with the prevailing wage rules in 8 CSR 30-3.010 to 8 CSR 30-3.060; (4) based upon my knowledge of these rules, including the occupational titles set out in 8 CSR 30-3.060, I have completed full and accurate records clearly indicating (a) the names, occupations, and crafts of every worker employed by this company in connection with this project together with an accurate record of the number of hours worked by each worker and the actual wages paid for each class or type of work performed, (b) the payroll deductions that have been made for each worker, and (c) the amounts paid to provide fringe benefits, if any, for each worker; (5) the amounts paid to provide fringe benefits, if any, were irrevocably made to a fund, plan, or program on behalf of the workers; (6) these payroll records are kept and have been provided for inspection to the authorized representative of the contracting public body and will be available, as often as may be necessary, to such body and the Missouri Department of Labor and Industrial Relations; (7) such records shall not be destroyed or removed from the state for one year following the completion of this company's work on this project; and (8) there has been no exception to the full and complete compliance with the provisions and requirements of Annual Wage Order No. _____ Section _____ issued by the Missouri Division of Labor Standards and applicable to this project located in _____ County, Missouri, and completed on the ____ day of _____, _____.

The matters stated herein are true to the best of my information, knowledge, and belief. I acknowledge that the falsification of any information set out above may subject me to criminal prosecution pursuant to §§290.340, 570.090, 575.040, 575.050, or 575.060, RSMo.

_____
Signature

Subscribed and sworn to me this ____ day of _____, _____.

My commission expires _____, _____.

_____
Notary Public

_____
Receipt by Authorized Public Representative

Missouri Department of Labor and Industrial Relations is an equal opportunity employer/program.

Exhibit D:

Switchgear Enclosure Specifications

ASSEMBLY 15
MEDIUM-VOLTAGE CIRCUIT BREAKER SWITCHGEAR

PART 1 GENERAL

1.1 SUMMARY

A. Design, fabricate, assemble, deliver, offload, and install one (1) metal-clad, medium-voltage switchgear lineup with draw-out, vacuum-interrupting type circuit breakers and auxiliary equipment housed in an outdoor protected aisle enclosure as specified herein and as shown on the Contract Drawings. Manufacturer may construct the enclosure on-site for installation of the switchgear lineup on-site by Manufacturer or deliver the enclosure with switchgear installed.

B. The switchgear lineup shall be factory assembled and installed in a sectioned, outdoor protected aisle enclosure at manufacturer's facility or on-site. The complete assembly shall include all interconnecting bus work, wiring, enclosure weather seals, and testing to ensure a fully functional switchgear lineup with minimum on-site external connection and testing.

C. The equipment provided by this Contract will replace an existing outdoor switchgear lineup located in the Owner's distribution substation. The existing switchgear and enclosure will be removed. If determined to be necessary based on switchgear structural calculations and drawings, existing foundation will be removed and a new concrete foundation will be installed by Others prior to shipment of the new outdoor switchgear. Schedule is of the essence, so manufacturer will need to provide on-site construction schedule agreeable to Owner if enclosure is to be built on-site.

D. The switchgear provided by this Contract will supply, control, and protect distribution substation feeder circuits. One (1) switchgear main breaker will be connected to a distribution substation transformer by copper bus duct. This bus duct will be supplied by this Contract as detailed in Assembly 18 – Outdoor Protected Aisle Switchgear Enclosure specifications. Distribution circuits will be connected to feeder breakers by underground, shielded, insulated copper or aluminum cable.

E. The switchgear and circuit breaker equipment design and installation shall provide reliable operation and long life in a distribution substation application where feeder circuits are subject to numerous and repetitive fault operations.

F. Construction of the switchgear shall be performed by qualified personnel and shall be accomplished in a professional manner. Only new and unused, top quality materials shall be incorporated into the project.

G. Miami Substation is located at 310 N Miami Ave, Marshall, Missouri, 65340.

H. Related Assemblies:
1. Assembly 18 – Outdoor Protected Aisle Switchgear Enclosure.

1.2 REFERENCES

A. Comply with all applicable industry standards, including, but not limited to, the latest revisions of the following:
   1. Institute of Electrical and Electronics Engineers:
      a. IEEE C37.04 – IEEE Standard Rating Structure for AC High-Voltage Circuit Breakers.
      b. IEEE C37.06 – AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis – Preferred Ratings and Related Required Capabilities.
      c. IEEE C37.09 – Standard Test Procedure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
      d. IEEE C37.010 – Application Guide for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
      e. IEEE C37.011 – Application Guide for Transient Recovery Voltage for AC High-Voltage Circuit Breakers.
      f. IEEE C37.11 – Standard Requirements for Electrical Control for AC High-Voltage Circuit Breakers Rated on A Symmetrical Current Basis.
      g. IEEE C37.12 – Guide for Specifications of High-Voltage Circuit Breakers (Over 1,000 Volts).
      h. IEEE C37.20.2 – IEEE Standard for Metal-Clad Switchgear.
      i. IEEE C37.081 – Guide for Synthetic Fault Testing of AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
      j. IEEE C57.13 – IEEE Standard Requirements for Instrument Transformers.
   2. National Electrical Manufacturers Association:
      a. NEMA C37.55 – Medium-Voltage Metal-Clad Switchgear Assemblies – Conformance Test Procedures.
   3. National Fire Protection Association:
      a. NFPA 70 – National Electrical Code (NEC).

1.3 SUBMITTALS

A. After award of purchase order, all engineering drawings, calculations, supporting data, bills of material, etc., shall be submitted electronically to Owner's Engineer and MMU for review before the manufacturing cycle begins. MMU will provide Supplier approval to proceed with manufacturing following engineering review. All documentation transmittals shall be identified with MMU's name, project designation, purchase order number, description, etc., and shall properly identify the purpose of the transmittal.

B. No design drawings, data, etc., will be considered for review which are not complete in all respects and which have not been thoroughly checked by the Supplier. Design drawings, data, etc., will not be considered for review that are contingent upon other features/drawings, which have not been submitted for review.

C. Owner's Engineer will review the drawings, data, etc., for compliance with the Specifications, will mark them to indicate whether changes or corrections are required and will return one (1) set to the Supplier. The Supplier shall resubmit the corrected or changed drawings, data, etc. Changes or corrections, etc., shall be clearly indicated.

NOTE: The Owner's Engineer review does not relieve the Supplier from any liability or responsibility for proper design, fabrication, or compliance with this Specification.

D. Design information shall be included on the Certified Drawings. The fact that such design information may later be included in the instruction and/or operating manuals does not relieve the Supplier from compliance with this requirement. Where standard drawings are furnished which cover a number of variations of the general class of equipment, each such drawing shall be individually endorsed to describe exactly which parts of the drawing apply to the equipment being furnished. Such endorsement shall also include the job name, purchase order/Contract number, and serial number of the particular item covered. Separate sheets of paper bearing this endorsement will not be acceptable.

E. Final Record: Two (2) final record documentation sets shall be submitted no later than ten (10) days following the final test of equipment. Any modifications required during the warranty period shall be accompanied by revised final documentation as required to update the copies furnished. Final documentation shall be labeled on the outside with Owner's name and location, description, order numbers, shop numbers, etc.

F. Prints and Instruction Books: Drawings shall be legible and shall be referenced as to project, purchase order number, etc. Final drawings, instruction books, parts data, etc., shall be indexed and bound into a common binder. The cover sheet shall reference the project. Legible drawings and data submitted to Owner shall be of such quality that said drawings and data shall be capable of yielding hard copy reproductions with every line, character, and letter clearly legible.

G. All final drawings and documents, except reproducible drawings, shall be bound in the instruction book with complete order data and index. All final drawings shall be complete with test values.

H. Final (Certified) Drawings shall be issued in the instruction books. As-built drawings shall be issued to replace all drawings in each instruction book only when said drawings have been modified.

I. Documents submitted to Engineer that do not conform to the requirements of this Specification shall be subject to rejection by Engineer. Supplier shall resubmit conforming documents. If conforming submittals cannot be obtained from the source documents, such source documents shall be retraced, redrawn, or photographically restored as may be necessary to meet such requirements. Supplier's failure to initially satisfy the legible quality requirements herein set forth, will not relieve Supplier from meeting the required schedule for submittal of drawings and data.

J. Mailing of Drawings and Data:

1. Approval drawings, etc., shall be transmitted by First Class mail, overnight by a suitable carrier, or email to the Engineer and Owner as follows:

Mr. Zachary R Marsden, P.E.
Toth & Associates, Inc.
1550 E. Republic Road
Springfield, MO 65804
Phone: (417) 888-0645
zmarsden@tothassociates.com

Mr. Doug Root
Marshall Municipal Utilities
75 E. Morgan Street
Marshall, MO 65340
Phone: (660) 886-6966 ext. 1300
droot@mmumo.net

2. A letter of transmittal must accompany drawings, data, etc. All transmittals received without a letter of transmittal containing such information will be returned to sender. In his letter, the Supplier may include other pertinent data or information.

NOTE: No payment will be made until all drawings and test reports have been received by the Engineer. Owner will not pay interest or assessments if payment is withheld due to Supplier's delay in fulfilling his entire obligation.

K. Electronic Copies of Drawings and Data:
1. All final drawings shall be furnished as AutoCAD® drawing files on CD. AutoCAD® (.dwg format) version 2019 is the preferred format, version 2015 minimum. CD shall be marked with the AutoCAD® software version number.
2. Electronic copies of the final instruction book shall be furnished in Acrobat® Adobe® (.pdf format) in addition to the paper copies furnished.
3. Electronic copies of all test reports shall be furnished in Acrobat® Adobe® (.pdf format) in addition to the paper copies furnished.

L. Two (2) certified copies of all tests shall be furnished by the Supplier, included in each copy of the instruction book.

M. A representative of Owner shall be allowed an opportunity to witness any or all tests. Notify Owner minimum four (4) weeks before testing.

N. Submittals shall include, but shall not be limited to, the following:
1. Outline and arrangement drawings showing:
   a. Switchgear floor plan view showing dimensions and locations of floor cutouts for power/control cable exits.
   b. Switchgear front elevations showing door-mounted equipment.
   c. Switchgear rear elevations showing bus arrangements, incoming line terminal arrangements, and feeder load terminal arrangements.
   d. Switchgear sectional views showing bus and compartment arrangements.
   e. Section interior views showing terminal block locations, fuse block.
   f. Shipping splits (if used).
2. One-line diagrams.
3. Three-line diagrams for relaying and metering.
4. Nameplate schedules.
5. Bill of materials.
6. Circuit breaker DC control schematic diagrams.
7. Accessory device AC and DC control schematic diagrams.
8. Compartment terminal and equipment wiring diagrams.

9. Breaker ratings and weights.
10. Instrument voltage transformer data.
11. Instrument current transformer data, including:
    a. Ratio correction curves.
    b. Excitation curves.
12. Product data for all components, relays, meter, and accessories.
13. Certified factory test results.
14. Recommended spare parts list.
15. Instruction manuals (O&M manuals).

O. For product data submittals, number of copies submitted shall be as follows:
1. Initial Submittal: Electronic Adobe® pdf copy to Engineer and Owner.
2. Re-submittal: Electronic Adobe® pdf copy to Engineer and Owner.
3. Distribution: Two (2) copies to Engineer and Owner.

1.4 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance (O&M) data in accordance with Item 1.3 – Submittals.
1. Submit sample instruction manuals during drawing approval process to Engineer and Owner for review for limited purpose of checking for conformance with Contract requirements.
2. Provide operation and maintenance data. Submit two (2) sets of data bound into hard-back, post-type binders in 8-1/2 by 11-inch text pages. Snap-ring binders are not acceptable.
3. Prepare binder cover and spine with printed title as follows:
    a. Manufacturer name.
    b. Type of manual (instruction, operation, maintenance, etc.).
    c. Equipment name.
    d. Project name.
    e. Contract name and number.
4. Internally subdivide binder contents with permanent page dividers, logically organized as described below, with tab titling clearly printed under reinforced laminated plastic tabs.
5. Operation and maintenance data books shall include:
    a. Table of contents.
    b. Appropriate design criteria.
    c. List of equipment.
    d. Parts list.
    e. Operating instructions.
    f. Maintenance instructions.
    g. Shop drawings and product data.
    h. Photocopies of warranties.
    i. Divider for Owner’s insertion of test reports.
    j. CD-ROM containing all electronic final drawings and reports.

B. O&M manuals shall include installation, operation, and maintenance instructions.
1. In addition to the above, O&M manuals shall include all data listed in this Item 1.3 – Submittals.

1.5 SPARE PARTS

A. The following spare parts shall be furnished and included in the base bid price:
   1. Three (3) voltage transformer primary fuses.
   2. Two (2) station power transformer primary fuses.
   3. One (1) box of power and/or control circuit fuses for each type and amp rating.
   4. Two (2) surge arresters.
   5. Two (2) circuit breaker spring-charging motors.
   6. Two (2) circuit breaker trip coils.
   7. Two (2) circuit breaker close coils.
   8. Three (3) LED-type pilot lamp assemblies with color cap for each color used.
   9. One (1) quart or two (2) 16-oz aerosol cans of touch-up paint to match switchgear section structure finish.

B. Submit an itemized price list with firm pricing valid for at least one (1) year after shipment for all recommended spare parts for the switchgear equipment, including any special tools, as required by the Contract Specifications.

1.6 WARRANTY

A. The manufacturer shall warrant all equipment supplied against defects in material and workmanship and shall supply a copy of this standard warranty (18 months from date of shipment or 12 months from date of energization) with the proposal.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Switchgear shall be shipped as completely assembled and installed in the outdoor protected aisle switchgear enclosure as possible within shipping limitations, unless manufacturer constructs enclosure on-site for switchgear installation on-site.

B. The outdoor protected aisle switchgear assembly shall be shipped in pieces as applicable shipping laws and regulations allow.

C. Any loose-shipped switchgear and circuit breaker equipment and materials shall be ~~placed in the outdoor protected aisle switchgear enclosure and~~ securely fastened in place prior to shipping.

D. See Item 1.7 of Assembly 18 (Outdoor Protected Aisle Enclosure) Specifications for additional enclosure shipping requirements.

PART 2 PRODUCTS

2.1 ACCEPTABLE OEM EQUIPMENT MANUFACTURERS

A. 15kV Switchgear shall be as manufactured by one of the following:
   1. ABB
   2. Eaton
   3. GE
   4. Siemens
   5. Square D

6. Approved Equal

2.2 CIRCUIT BREAKER SWITCHGEAR DESIGN

A. Indoor, metal-clad, medium-voltage circuit breaker switchgear assembly conforming to IEEE C37.20.2.

B. Single-high, draw-out, vacuum-interrupter type circuit breaker lineup with disconnecting drawer-mounted voltage transformers and power fuses. Circuit breaker installation shall be limited to the lower compartment, no exceptions.

2.3 RATINGS

A. Nominal Voltage Class: 13.2 kV RMS, three phase.

B. Rated Maximum Voltage: 15.0 kV RMS.

C. Rated Frequency: 60 hertz.

D. Low-Frequency Withstand Voltage: 36 kV RMS.

E. Impulse Withstand Voltage: 95 kV peak.

F. Main Bus Ampacity: 2,000 amperes, continuous.

G. Short-Circuit Current (at maximum rated kV): 27 kA RMS.

H. Main Bus Withstand Short Circuit Momentary Current: 27 kA RMS.

2.4 SWITCHGEAR CONSTRUCTION

A. The switchgear lineup shall be indoor construction, installed in an environmentally conditioned outdoor protected aisle enclosure.

B. The switchgear assembly shall consist of individual, freestanding vertical sections with compartments housing circuit breakers or auxiliaries bolted together to form a rigid self-supporting structure. Metal side sheets shall provide grounded barriers between adjacent compartments and sections and solid removable metal barriers shall isolate the major primary areas in each section.

C. Each switchgear section, except unit 11, shall be furnished with an upper and lower steel hinged front door, complete with handles and provisions for padlocking. No special tools shall be required to latch the front compartment doors. Doors shall be furnished with turned-back edges and additional bracing as required for rigidity. Positive stops and latches shall be provided for control of each door in the open and closed positions. The lower compartment door for the circuit breaker section shall be free of any devices or openings. All circuit breaker controls, pilot lamps, protective relays, lockouts, and other auxiliary devices shall be located in the upper compartment with a separate door. Relays and test switches shall be rack mounted in the upper compartment door. Pilot lamps, lockout relays, and control switches shall be flush mounted in the upper compartment door. Control devices, terminal blocks, fuses, and auxiliary relays shall be located in the

upper compartment on steel mounting pans. The upper compartment shall be fully barricaded and isolated from the lower breaker compartment with metal panels.

D. Unit 11 shall be furnished with a single hinged front door, complete with a handle and provisions for padlocking. No special tools shall be required to latch the front compartment door. Door shall be furnished with turned-back edges and additional bracing as required for rigidity. Positive stops and latches shall be provided for control of door in the open and closed positions. The compartment door shall be free of any devices or openings, except for a protective window for easy switch viewing.

E. Hinged and gasketed rear doors, complete with positive stops, latches, and handles with provisions for padlocking shall be provided for each section to access incoming bushing leads and cable terminations, surge arresters, and the station power transformers. Refer to Assembly 18 - Outdoor Protected Aisle Switchgear Enclosure for details of rear access doors.

F. Each compartment shall be completely barricaded and isolated from adjacent compartments and the rear compartment.

G. Each switchgear section breaker compartment and rear cable compartment shall be furnished with space heaters to prevent condensation of moisture within the switchgear. Space heaters shall be supplied from a thermostat-controlled, 240/120-volt AC, three-wire bus which shall extend the entire length of the switchgear lineup. Power for the space heater bus shall be supplied from an AC distribution panel in the outdoor protected aisle enclosure. Thermostat controls, wiring, and bus supply overcurrent protection and disconnection integral to the switchgear assembly shall be provided.

H. Each switchgear section breaker compartment, low-voltage compartment, and rear cable compartment shall be furnished with an LED light. Lights shall be controlled by a single pole light switch. Lights shall be supplied from 120-volt, AC, three-wire bus which shall extend the entire length of the switchgear lineup. Power for the lighting bus shall be supplied from an AC distribution panel in the outdoor protected aisle enclosure.

I. Sections shall be arranged in the order as shown on the Contract Drawings.

J. Circuit Breaker Compartments:
   1. Designed to house a horizontal drawout circuit breaker.
   2. Provide screw-type circuit breaker racking mechanism for manual operation by a field-engaged crank for positioning the circuit breaker in the compartment.
   3. Circuit breaker racking mechanism shall permit and indicate disconnect, test, and connect positioning of the circuit breaker in the compartment.
   4. Circuit breakers shall be direct roll-in type and have four or more wheels for movement.
   5. Provide design and hardware for circuit breaker racking operation with door closed. Each compartment will have AC receptacle for remote racking operator, mounting brackets for remote racking operator where applicable, and port with removal cover for remote racking.
   6. Main bus and load primary insulated bus stab connections shall be stationary, silver-plated copper contacts located behind an automatic steel shutter which covers the contacts when the circuit breaker is racked out of the connected position.

7. Main bus and load primary insulated bus stab connections shall have provisions for line and load-side current transformer mounting.
8. Compartment secondary control circuit contacts shall be stationary, mounted within the compartment so as to automatically engage the control circuit contacts on the circuit breaker in both the test and connected positions.
9. Both switch operator and switch must be visible and accessible from the front of the low voltage compartment when the circuit breaker is in the fully connected position.
10. A stationary, mechanism-operated cell switch (MOC) shall be mounted in each circuit breaker compartment.
    a. Directly activated by the circuit breaker mechanism when the circuit breaker is in the connected or test position only.
    b. Minimum ten (10) pole with five (5) NO and five (5) NC contacts.
    c. 20-amp continuous rating.
11. A stationary, truck-operated cell switch (TOC) shall be mounted in each circuit breaker compartment.
    a. Mechanically activated switch that changes state when the circuit breaker element is racked into or out of the connected position.
    b. Minimum ten (10) pole with five (5) NO and five (5) NC contacts.
    c. 20-amp continuous rating.

K. Voltage Transformer Compartments:
1. Designed to house horizontal, fused, draw-out voltage transformers mounted on drawers.
2. Each compartment drawer shall have guide rails and a roll-out tray suitable for mounting up to three (3) voltage transformers.
3. The roll-out trays shall disengage from bus connections and operate bus shutters when pulled forward and shall automatically ground the primary side of the voltage transformers.

L. Low-Voltage Compartments:
1. Designed to house interior-mounted control devices and terminal block wiring interfaces for circuit breaker control, metering, and relaying.
2. Circuit breaker control switches, indicating lights, auxiliary control switches, protective relays, and lockout relays shall be mounted per Item 2.4.C above.
3. Cubicle 2 will have provisions for a rack-mount ethernet switch. Ethernet switch to be provided by MMU.

M. Rear Compartments:
1. General: The structural sub-base of the outdoor protected aisle enclosure shall be inset 24 inches from the switchgear exterior rear cable compartment doors to prevent slab duct stub-ups from being enclosed by the switchgear enclosure structural base. Each rear compartment shall have a removable 11-gauge metal bottom plate for bottom cable entry conduit connection.
2. Supplier shall install accessible grounding studs on each phase and neutral bus in each switchgear section rear compartment.
3. Supplier shall install phase label identifiers on all accessible bus in each switchgear section rear compartment.
4. Furnish polyvinyl boots to fully insulate all terminations, including Owner furnished 15-kV, 500, 750 and 1,000-kcmil conductors.
5. Main Breakers:

a. Provide for top entry through enclosure via extension of bus conductors to the exterior gasketed, bus duct.
b. Provide hinged rear door on main breaker for access to lower bushing stud connectors.
c. Horizontal main bus shall be barricaded.
d. Surge arresters shall be located in each Main Breaker compartment.

6. Feeder Breakers:
   a. Provide for bottom power cable entry. Termination point for power cables shall be coordinated with Engineer to permit termination of existing cables.
   b. Sections shall be furnished with horizontal members to support conductors and relieve strain on termination bus.
   c. Horizontal main bus shall be completely barricaded.
   d. Surge arresters shall be located in each Feeder Breaker compartment.
7. Bus Tie Breaker:
   a. Horizontal main bus shall be completely barricaded.
8. Auxiliary Compartments:
   a. Mounting and insulated connections for primary leads to auxiliary section roll-out station power transformer primary fuse tray in Cubicle 2.
   b. Mounting and connections for the bus section three-phase voltage transformers, including insulated connections for primary leads to auxiliary section roll-out voltage transformer drawers in Cubicles 1 and 5 through 10.
   c. Mounting and connections for 1200A load interrupt switch in Cubicle 11.

N. Main Bus:
1. Copper with silver-plating along the entire length to a thickness between 0.0001 inches and 0.0005 inches.
2. Insulated with track-resistant, fluidized-bed epoxy, flame-retardant coating.
3. Bus insulator supports shall be rigid, flame-retardant, track-resistant, and non-hygroscopic.
4. Bus joints shall be insulated with polyvinyl boots.
5. Insulation inserts are required whenever bus passes through a barrier of any type.
6. Main bus shall be completely barricaded and shall be fully accessible.
7. All buses, bus supports, and connections shall be capable of withstanding the mechanical forces imposed by short-circuit currents equal to the momentary current rating of the circuit breakers.

O. Switchgear Neutral/Ground Bus:
1. An uninsulated copper neutral/ground bus (intact rectangular bus bar) with a momentary rating at least equal to the momentary rating of the circuit breakers shall extend the entire length of the switchgear lineup.
2. All switchgear equipment requiring grounding shall be connected to this neutral/ground bus.
3. The neutral/ground bus shall extend into compartments for circuit breaker, voltage transformer, station power transformer, safety shutter, and drawer grounding.
4. All spliced connections of the bus bar shall be accessible to allow bolting/unbolting and inspection.
5. The switchgear neutral/ground bus shall be factory connected to the powerhouse enclosure interior grounding bus in one location, and extend outside the enclosure

near both ends of the switchgear cubicle lineup for connection of 4/0 AWG bare copper stranded cables to the station ground grid.

6. The ground bus shall be accessible in the rear compartments for surge arrester, concentric neutral, and conductor shield grounding.
7. Furnish compression lugs for concentric neutral grounding termination using NEMA two-hole design.

2.5 CIRCUIT BREAKERS

A. Furnish nine (9) circuit breakers as specified herein and as shown on the Contract Drawings. Quantity includes one (1) spare feeder breaker.

B. Design:

1. Vacuum-interrupting type.
2. Horizontal, draw-out construction, roll-in breakers. Breakers withdrawn on rails with a dockable dolly are not acceptable.
3. Mechanically operated by a front-accessible, spring-charged, stored-energy mechanism, normally charged by an integral 125-volt DC motor.
4. Stored energy mechanism shall also be capable of manual charging by means of a manual handle for emergency operation and testing.
5. Electrically and mechanically trip-free design which will allow tripping during closing operation.
6. Mechanical tripping of a closed circuit breaker shall only be possible with the front cubicle door closed.
7. Vacuum Interrupters:
    a. Individual-phase, hermetically sealed, high-vacuum, maintenance-free design.
    b. Contact wear indicator for each vacuum interrupter.
    c. Low-current chopping characteristics.
8. Mechanical Interlocks:
    a. Prevent insertion or withdrawal of a closed circuit breaker.
    b. Prevent closing a circuit breaker between positions.
    c. Prevent closing a circuit breaker during any portion of the racking process.
    d. Automatically discharge stored energy mechanism on circuit breaker withdrawal.
    e. Circuit breaker cannot be racked into connected position without being connected to the control power.
9. Capable of being padlocked in a trip-free condition.
10. Provide steel front panel to barrier operating personnel from the stored energy mechanism, interrupters, and contacts. Panel shall be removable when the circuit breaker is withdrawn.
11. Circuit breaker front panel shall include:
    a. Mechanical open/close indication.
    b. Mechanical operator charged/discharged indication.
    c. Manual close button.
    d. Manual trip button.
    e. Operation counter.
12. Silver-plated copper primary contact fingers that engage the compartment stationary contacts when the circuit breaker is moved to the connect position.

13. Secondary control circuit contacts that engage the compartment stationary control circuit contacts when the circuit breaker is moved to the test and connect position.
14. Provide an integral auxiliary switch as follows:
    a. Mounted directly on circuit breaker with sufficient number of contacts to provide all necessary interlocks for operation of the circuit breaker.
    b. Minimum of two (2) NO and two (2) NC contacts shall be wired out for remote interlocking service.
    c. 20-amp continuous rating.
15. Provisions for operating compartment-mounted MOC and TOC switches.
16. Circuit breaker ratings shall be as follows:
    a. Rated Nominal Voltage Class: 13.2 kV RMS.
    b. Rated Maximum Voltage: 15 kV RMS.
    c. Rated Voltage Range Factor, K: 1.0.
    d. Rated Low-Frequency Withstand Voltage: 36 kV RMS.
    e. Rated Impulse Withstand Voltage: 95 kV peak.
    f. Rated Continuous Current: 2,000 amps for main breaker and one (1) tie breaker; 1,200 amps for feeder and generator breakers and one (1) tie breaker.
    g. Maximum Rated Short Circuit Current: 27 kA RMS symmetrical.
    h. Maximum Symmetrical Interrupting Capability: 27 kA RMS symmetrical or up to 15 percent higher of the maximum rated short circuit current.
    i. Short-Time Current-Carrying Capability: 27 kA RMS symmetrical or up to 15 percent higher of the maximum rated short circuit current.
    j. Closing and Latching Capability: 65 kA crest.
    k. Rated Interrupting Time: Five cycles.
    l. Nominal Control Voltage: 125-volts DC.

2.6 VOLTAGE TRANSFORMERS (VT)

A. Furnish, install, and wire all VTs of the design, quantity, and type as specified herein and as shown on the Contract Drawings.

B. Each set of VTs and associated fuse assemblies shall be installed in a separate, horizontal draw-out drawer located in a front-accessible VT compartment.

C. Where physical size restrictions do not allow the voltage transformer to be mounted in a draw out assembly, the voltage transformer may be stationary mounted with the fuses only mounted in the draw out unit. Appropriate interlocks shall be provided to ensure maximum operator safety.

D. Design:
1. Indoor, dry type.
2. Epoxy cast or molded thermoplastic design.
3. Integral mounted primary current-limiting fuses.
4. Externally mounted, accessible and stationary secondary fuses.
5. Three-phase sensing shall be provided by three transformers connected grounded wye as indicated on the attached one-line sketch.
6. 13200V Delta, 70:1 ratio, 95-kV BIL.
7. ANSI C57.13 Design:
    a. Accuracy Class 0.3.

b. Burdens W, X, and Y.
c. Thermal rating of 1,000 VA at 55 degrees C.

2.7 CURRENT TRANSFORMERS (CT)

A. Furnish all relaying CTs of the design, quantity, and size as specified herein and as shown on the Contract Drawings.

B. IEEE C57.13 relaying accuracy class unless otherwise noted herein or shown on the Contract Drawings.

C. Phase CTs:
1. Toroidal-window type, single ratio, 600 volt, 10 kV BIL.
2. Installed on the stationary, insulated line and load bus tubes in each circuit breaker compartment.
3. CTs shall be front accessible (after removal of safety shutter on circuit breakers).
4. CTs shall be wired to shorting-type terminal blocks in each low-voltage compartment. Marathon 1500 SC or approved equal.
5. Minimum continuous thermal rating factor shall be 1.5 at 55 degrees C ambient.
6. Minimum accuracy ratings shall be as follows:
   a. 3,000/5A, 2,000/5A, 1,500/5A, and 1,200/5A ratios, C200 accuracy.
   b. 1,000/5A, 800/5A, and 600/5A ratios, C200 accuracy.
   c. 500/5A, 400/5A, and 300/5A ratios, C100 accuracy.
   d. 250/5A, 200/5A, and 150/5A ratios, C50 accuracy.
   e. 100/5A, 75/5A, and 50/5A ratios, C20 accuracy.

2.8 CONTROL WIRING

A. Furnish and install all circuit breaker control, metering, and relaying wiring, terminal blocks, and wiring identification.

B. Wiring:
1. Switchboard type SIS VW-1, 600 volts, 90 degrees C, extra flexible stranded.
2. Minimum 12 AWG copper.
3. CT Secondary Wiring: Minimum 10 AWG copper.
4. Control power supply wiring shall be sized based upon the overcurrent protection provided and the connected load.
5. Relay Communication Wiring: Prefabricated cable assemblies with pre-terminated DB connectors or fiber-optic connectors suitable for the application, supplied to support SEL relay and communications processor equipment. Relay communications wiring, if required, shall also include all fiber-optic interface cables, modems, and transceivers.
6. Panduit ring-tongue, insulated, crimp connector terminations utilizing Panduit crimp tool.
7. Plastic wire markers of either the slip on or heat shrink variety with opposite end designation shall be provided at each termination.
8. Wire numbers shall be labeled to match the equipment connection diagrams.
9. All interior wiring shall be neatly installed in wiring gutters or conduit and shall be terminated at terminal blocks.
10. Splicing of control wire is not permitted. Control wiring must be a continuous length from terminal to terminal.

11. Exposed wiring shall be suitably protected against contact with sharp edges. Throughout the assembly it must be neatly bundled and secured with nylon wire ties.
12. Where control wiring passes from cubicle to door, it must be wrapped with suitable protection so as to prevent damage.
13. Control wires leaving the cubicle of origin must first terminate on a terminal block. No control wire may leave a cubicle directly from any other device. Space heater circuits are an exception.
14. Holes cut to allow control wires to pass from cubicle to cubicle shall have a grommet for protection.
15. Switchgear units that are split for shipment shall be furnished with all wiring required to interconnect the switchgear units tagged and provided with ring tongue terminators ready for field connection by Supplier.

C. Grounding:
1. All CT shorting-type terminal blocks and devices utilizing electrical energy or connected to voltage (VT) and current (CT) circuits shall have their enclosure, case, or ground terminal wired directly to the switchgear ground bus.
2. Each device shall have a dedicated ground wire connected to the switchgear ground bus. Wire looping between terminal block points and devices will not be acceptable.
3. Ground wire shall be minimum 12 AWG copper with green-colored insulation.

D. Terminal Blocks:
1. External field wiring interfaces shall be located at terminal blocks in low-voltage compartments.
2. Marathon, heavy-duty, 600-volt, 30-amp design.
3. Binding screw-type terminals capable of terminating two (2) 10 AWG copper wires per terminal. All terminal blocks shall utilize pan head, slotted screws.
4. Shorting type for external CT secondary leads.
5. Permanently marked terminal block points at each termination.
6. All breaker MOC and TOC auxiliary contacts, lockout relay contacts, and protective relay auxiliary contacts shall be wired out to sliding link terminal blocks in the breaker low-voltage compartment.
7. A minimum of ten percent (10%) spare or twelve (12) spare terminal block points, whichever is more, shall be provided in the low-voltage compartment at each breaker for Owner's use.
8. Terminal block points shall be numbered to match the equipment connection diagrams.

2.9 PROTECTIVE RELAYS AND CONTROLS

A. Provide protective relays and other control equipment in accordance with Contract drawings.

B. The switchgear configuration and protection is shown on Drawing ER-101 – Switchgear No. 1 Relay One Line.

C. Each protective relay output that is utilized shall be able to be fully isolated by opening one test switch. Coordinate with Engineer regarding test switch layout.

D. Protective interface descriptions for each breaker/relay will be provided by Engineer.

E. Supplier must make provisions for transformer protection lockout relay contacts into the trip and block close circuits of the switchgear main circuit breaker. Contacts will be assigned by Engineer.

2.10 CIRCUIT BREAKER CONTROL

A. Local Breaker Control Switch Indicating Lights (Breaker Position):
1. Red-closed light shall be wired to monitor trip coil continuity.
2. Green-open light shall be wired in series with breaker auxiliary "b" contact.

B. 13.2-kV Main Breaker BKR 1 Control:
1. Local close and trip control for breaker shall be permitted in the test and connected breaker positions.
2. Remote close and trip control for breaker shall be permitted in the test and connected breaker positions.
3. Closing of the Main Breaker shall be supervised by a "sync-check" output from the main breaker relay.

C. 13.2-kV Generator Breaker BKR 3, BKR 4 Control:
~~1.~~ Remote close and trip control for breaker shall be permitted in the test and connected breaker positions.
~~2.~~1.
~~3.~~2. Closing of the Generator Breakers shall be supervised by a "sync-check" output from the generator breaker relays.

D. 13.2-kV Tie Breaker BKR 5, BKR 9 Control:
1. Local close and trip control for breaker shall be permitted in the test and connected breaker positions.
2. Remote close and trip control for breaker shall be permitted in the test and connected breaker positions.
3. Closing of the Tie Breaker shall be supervised by a "sync-check" output from the tie breaker relay.

E. 13.2-kV Distribution Feeder Breaker BKR 6, BKR 7, BKR 8, BKR 10 Control:
1. Local close and trip control for breaker shall be permitted in the test and connected breaker positions.
2. Remote close and trip control for breaker shall be permitted in the test and connected breaker positions.
3. Closing of the Distribution Feeder Breaker shall be supervised by a "sync-check" output from the distribution feeder breaker relay.

2.11 FUSE BLOCKS AND FUSES

A. Furnish and install all fuse blocks and fuses required to distribute power and provide protection to all circuit breaker control circuits, voltage transformer secondary connections, and switchgear condensation heater bus circuits.

B. Furnish and install two (2) sets of control power fusing for each circuit breaker: one (1) set of fuses for the closing power circuit and one (1) set of slugs for the tripping power circuit.

C. Furnish and install branch circuit power fusing for section lineup condensation heaters. Each section shall have its condensation heaters individually protected by branch circuit fusing tapped off a common lineup condensation heater bus circuit.

D. Furnish and install voltage transformer secondary fusing.

E. Design:
   1. Bussmann, heavy-duty, phenolic, insulated, pull-out type or heavy-duty, phenolic, integral knife-switch type.
   2. Fuse blocks shall be grouped or ganged as required to ensure multi-pole switching and disconnection.
   3. Fuse blocks shall be supplied with indicating light fuse covers to provide blown fuse indication.

2.12 125-VOLT DC CONTROL POWER BUS

A. Furnish, install, and wire 125-volt DC control power buses, No. 8 AWG minimum, for the switchgear lineup, circuited from branch circuit breakers of the DC panelboard. Each switchgear section shall be fed by a separate circuit breaker in the DC panelboard(s).

B. Each control power bus shall extend the length of the switchgear sections to provide a control power supply in the circuit breaker and auxiliary low-voltage compartments.

C. The design for each control power bus shall include incoming supply disconnection and overcurrent protection.

2.13 AC POWER BUS

A. Furnish, install, and wire 240/120-volt AC, three-wire power buses for the switchgear lineup, circuited from branch circuit breakers of the AC panelboard.

B. Each power bus shall extend the length of the switchgear sections to provide a power supply to the switchgear lineup condensation heaters and lights.

C. The design for each power bus shall include incoming supply disconnection and overcurrent protection.

D. Each section shall be provided with branch circuit fusing for the section condensation heaters, as indicated in Item 2.11C above.

2.14 SURGE ARRESTERS

A. Furnish, install, and wire surge arresters as specified herein and as shown on the Contract Drawings.

B. Connected to each breaker termination in the rear compartment.

C. The surge arresters shall be rear accessible.

D. Design:
   1. Three, single-pole design.
   2. Metal-oxide, polymer housing.
   3. 13.2-kV rated station class.
   4. 8.4-kV MCOV rated.

2.15 NAMEPLATES

A. Furnish and install nameplates to identify each compartment. All front panel-mounted switches, etc. and all major internal-mounted equipment and devices, including VT drawers, primary fuse drawers, circuit breakers, fuse blocks, and terminal blocks shall have a nameplate for identification.

B. Design:
   1. 1/8-inch thick laminated phenolic.
   2. Black face, white core shall be used on identification nameplates unless otherwise noted on the Contract Drawings.
   3. Yellow face, black core shall be used on caution nameplates unless otherwise noted on the Contract Drawings.
   4. Red face, white core shall be used on warning nameplates unless otherwise noted on the Contract Drawings.
   5. Minimum 3/16-inch high engraved characters.
   6. Screw mounting.
   7. Engraving designations shall be reviewed by the Engineer and Owner prior to manufacture.

2.16 SPECIAL TOOLS

A. Furnish, as a minimum, the following special tools for proper installation, maintenance, and adjustment of the switchgear:
   1. One (1) manual circuit breaker racking crank.
   2. One (1) manual circuit breaker spring charging lever.
   3. One (1) tube of contact lubricant.
   4. One (1) quart on touch-up paint for switchgear structure interior and exterior doors.
   5. One (1) circuit breaker test jumper for checking circuit breaker operation outside the compartment utilizing front door controls.
   6. Spare parts as listed in Item 1.5 - Spare Parts above.

B. Circuit Breaker Test Cabinet:
   1. Furnish, install, and wire one (1) wall-mount circuit breaker test cabinet with test connection cable.
   2. The test kit shall be installed in the outdoor protected aisle switchgear enclosure with a two pole breaker to permit setup prior to spring charge motor charging.

C. Circuit Breaker Remote Racking Operator:
   1. Furnish circuit breaker remote racking operator to permit remote-controlled insertion or removal of a circuit breaker device between test/disconnect and connect positions.
   2. Motorized device which permits installation and remote racking with the circuit breaker compartment door in the closed position only.

3. Furnished with a control switch station connected by a flexible cable assembly to permit operation outside the exterior entry door of the outdoor protected aisle switchgear enclosure. Remote control device cable length shall be minimum 50-feet long.
4. Power supply shall be 120-volts AC via a flexible cord with a three-prong plug connected to the operator.
5. Integral motorized racking mechanism installed for each circuit breaker is an acceptable alternate.

2.17 FINISH

A. All metal framework, doors, barriers, and panels shall be degreased and phosphatized after cutting, drilling, or punching for assembly, access, and equipment mountings.

B. Provide manufacturer's standard corrosion-resistant primer coatings.

C. Shelter Aisle Finish Coat: ANSI 61 Light Gray.

D. Cubicle Interior Finish Coat: Bright White Enamel

E. Minimum two (2) finish coats.

F. Coating process shall be done by electrostatic application of polyester powder with an average final baked thickness between 1.5 and 4.0 mils.

G. Furnish one (1) quart of touch-up paint each for both ANSI 61 Light Gray and Bright White Enamel.

2.18 ASSEMBLY

A. The Supplier shall completely assemble and install the switchgear, circuit breakers, test cabinet, lighting, emergency lighting, receptacles, and miscellaneous equipment in the outdoor protected aisle switchgear enclosure prior to shipment to ensure proper fit and functional operation. If manufacturer constructs the enclosure on-site, the switchgear shall be assembled as much as possible prior to shipment.

B. The assembly shall include, as a minimum, all interconnecting bus work, wiring, and testing prior to shipment.

C. The assembly shall also include mounting, wiring, and operation of the circuit breaker test cabinet prior to shipment.

2.19 QUALITY CONTROL

A. Factory test switchgear in accordance with IEEE C37.20.2 and all other applicable ANSI and IEEE standards.

B. Witness Testing and Factory Inspections:
1. The Owner reserves the right to witness factory and shop testing of the switchgear equipment.

a. The Supplier shall notify Owner a minimum of four (4) weeks prior to the date when factory and shop testing will begin.

2. The Owner reserves the right to factory and shop-inspect the switchgear equipment prior to packaging for shipment.
   a. The Supplier shall notify Owner a minimum of four (4) weeks prior to the date when assembled and installed inspection will be allowed.
3. The Supplier shall be responsible for making any repairs or changes to the switchgear equipment that is not in compliance with the Contract Specification requirements, Contract Drawings, or Supplier's Shop Drawings.

C. Test Results:
1. The Supplier shall notify the Owner of any unusual event or damage occurring during the fabrication, assembly, and installation of the switchgear lineup, and of all tests which do not meet specified standards. The Owner reserves the right to inspect such damages or test failures. Corrective measures to overcome such damage or failure shall be subject to acceptance by the Owner.
2. Two (2) copies of the certified test report shall be delivered to the Owner not later than ten (10) days after completion of all factory and shop tests.
3. A copy of the test report shall also be included in each copy of the Contract Operations and Maintenance (O&M) manual.

2.20 PROJECT MILESTONES

A. Work is to be in accordance with the following project milestone dates. Dates are tentative.

1.	Advertise for Bid	04/10/2025 to 05/08/2025
2.	Available to Bidders	April 10, 2025
3.	Bid Opening	May 8, 2025
4.	Recommendation and PO Issued	June 5, 2026
5.	Delivery to Project Site	August 31, 2026

B. This Schedule is prepared for the Bidder’s information and convenience of understanding the content and scheduling of the work. Contractor shall prepare and submit his schedule in taking indicated information into account. Modifications in the Bidder’s schedule shall be reviewed for approval by Owner.

C. Owner will not accept delivery before the window stated in Item 2.20-A.5. The Supplier shall be responsible for storage facilities and fees if the Supplier completes the manufacturing before the delivery window.

D. Owner may elect to request storage of the enclosure at Supplier’s facility for up to six (6) months after the delivery date stated in Item 2.20-A.5. Supplier shall provide pricing for these storage durations as requested on the Bid Form, and any Supplier terms and conditions for storage of this equipment.

E. Should the Supplier neglect, refuse, or fail to deliver the material within the time set forth above, or any proper extension thereof granted by the Owner, the Supplier shall pay to the Owner $1,000 (One Thousand Dollars) per day for each and every day that such delivery is delayed beyond the specified time. Said obligation of the Supplier is not a penalty, but is liquidated damages for loss to the Owner and the public, after the expiration of the time stipulated in the purchase agreement, as adjusted by duly executed

change orders, and will be deducted from any money due the Supplier under this purchase agreement. The Supplier and surety of record shall be liable for any and all liquidated damages. Nothing contained herein shall preclude claims by the Owner for damages caused by Supplier errors, omissions, or negligence unrelated to delay in delivering within the time for completion in the purchase agreement.

PART 3 EXECUTION

3.1 SUPPLIER'S FIELD SERVICES

A. The Supplier shall be responsible for providing factory-trained service personnel at the project site to supervise and perform equipment unloading, positioning, alignment, leveling, anchoring, connection, and wiring reconnections of the switchgear. The Supplier's site personnel shall be familiar with the unloading and erection procedures for the equipment supplied and have previous experience supervising and performing similar projects. The Supplier's price shall include all costs associated with the field service activities, including, but not limited to materials, tools, equipment, hardware, travel expense, lodging, meals, and man-hours for the field service site personnel.

B. Additional trips to the site shall be reimbursed only if trip was requested in writing by the Owner. Provide technical assistance for inspection, installation, adjustment, testing, and initial energization. Provide on-site training and instruction in the operation and maintenance techniques pertaining to the equipment. Correct all wiring and other manufacturing errors discovered in the field promptly and at no cost to the Owner.

C. Submit a written inspection and test report to the Owner, with a signed statement that the equipment has been properly installed, tested, and is ready for energization.

D. If equipment arrives with visible damage or probable hidden damage, the Supplier's field service personnel shall inspect the equipment and make repairs as required. Such trip costs and related expenses shall be borne by the Supplier. Forward a written report to the Owner and have the field service personnel itemize the damage incurred.

E. Documentation: Two (2) copies of the field services report shall be delivered to the Owner not later than five (5) days after completion of all field services.

3.2 TRAINING

A. Supplier shall provide option pricing for a training session at the Owner's site.

B. The training session shall be conducted by a manufacturer's qualified representative. Training program shall include instructions on the assembly, circuit breaker, protective devices, and other major components.

END OF SECTION

ASSEMBLY 18
OUTDOOR PROTECTED AISLE SWITCHGEAR ENCLOSURE

PART 1 GENERAL

1.1 SUMMARY

A. Design, fabricate, assemble, deliver, offload, and install one (1) outdoor protected aisle enclosure with all service equipment and facilities as specified herein and as shown on the Contract Drawings to house medium-voltage circuit breaker switchgear and accessories. Manufacturer may construct the enclosure on-site for installation of the switchgear lineup on-site by Manufacturer or deliver the enclosure with switchgear installed.

B. The Supplier shall assemble and install the medium-voltage circuit breaker switchgear lineup, service equipment, and accessories in the enclosure at manufacturer's facility or on-site. Installation shall include all interconnecting bus work, wiring, and testing to ensure a fully functional enclosure package, with minimum on-site assembly, external connection, and testing.

C. The outdoor protected aisle switchgear enclosure scope shall generally include the following:
1. Weatherproof, all metal construction, pitched roof enclosure with structural steel base and insulated floor, walls, and ceiling.
2. Wall-mounted package HVAC and thermostat for interior space conditioning, including wiring.
3. Interior LED light fixtures, three-way switching, and wiring.
4. Interior self-contained, battery-type, LED emergency lights and wiring.
5. Exterior photocell-controlled LED light fixtures and wiring.
6. Interior and exterior convenience receptacles and wiring.
7. AC distribution panelboard(s) and wiring.
8. DC distribution panelboard(s) and wiring.
9. Enclosure, equipment, and raceway system grounding.
10. Enclosure and equipment wiring, conduit, and raceway systems.
11. Provisions for exterior structure grounding connections.
12. Provisions for bottom entry raceways into switchgear cable compartments and interior vertical cable riser.
13. Exterior roof-mounted, gasketed bus duct for connection of exterior copper bus duct supply between power transformer low-voltage bushings and the switchgear main breakers.
14. Class C, 20-lb carbon dioxide fire extinguisher and bracket wall-mounted next to each enclosure exit door.

D. The enclosure design and construction shall provide long life as an electrical equipment powerhouse enclosure at an outdoor distribution substation site.

E. Construction of the enclosure shall be performed by qualified personnel and shall be accomplished in a professional manner. Only new and unused, top quality materials shall be incorporated into the project.

F. The existing switchgear and enclosure will be removed. Owner preference is to re-use existing foundation. Existing foundation should only be replaced if it can not be used as is or modified to be used. If determined to be necessary based on enclosure structural calculations and drawings, existing foundation will be removed and a new concrete foundation will be installed by Others prior to shipment of the new enclosure. Schedule is of the essence, so manufacturer will need to provide on-site construction schedule agreeable to Owner if enclosure is to be built on-site.

G. Miami Substation is located at 310 N Miami Ave, Marshall, Missouri, 65340.

H. Related Assemblies:
   1. Assembly 15 – Medium-Voltage Circuit Breaker Switchgear.

1.2 REFERENCES

A. Comply with all latest revisions of the applicable industry standards of the following organizations:
   1. American Hot Dipped Galvanizers Association (AHDGA).
   2. American Institute of Steel Construction (AISC).
   3. American Iron and Steel Institute (AISI).
   4. American National Standards Institute (ANSI).
   5. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)
   6. American Society of Mechanical Engineers (ASME).
   7. American Society for Testing and Materials (ASTM).
   8. American Welding Society (AWS).
   9. Insulated Cable Engineers Association (ICEA).
   10. Institute of Electrical and Electronics Engineers (IEEE).
   11. International Code Council, Inc. (ICC).
   12. Metal Building Manufacturers Association (MBMA).
   13. National Electrical Contractors Association (NECA).
   14. National Electrical Manufacturers Association (NEMA).
   15. National Electrical Testing Association (NETA).
   16. National Fire Protection Association (NFPA).
   17. Occupational Safety and Health Administration (OSHA).
   18. Steel Structures Painting Council (SSPC).
   19. Underwriters' Laboratories, Inc. (UL).

1.3 SUBMITTALS

A. After award of purchase order, all engineering drawings, calculations, supporting data, bills of material, etc., shall be submitted electronically to Owner's Engineer and MMU for review before the manufacturing cycle begins. MMU will provide Supplier approval to proceed with manufacturing following engineering review. All documentation transmittals shall be identified with MMU's name, project designation, purchase order number, description, etc., and shall properly identify the purpose of the transmittal.

B. No design drawings, data, etc., will be considered for review which are not complete in all respects and which have not been thoroughly checked by the Supplier. Design drawings, data, etc., will not be considered for review that are contingent upon other features/drawings which have not been submitted for review.

C. Owner's Engineer will review the drawings, data, etc., for compliance with the Specifications, will mark them to indicate whether changes or corrections are required and will return one (1) set to the Supplier. The Supplier shall resubmit the corrected or changed drawings, data, etc. Changes or corrections, etc., shall be clearly indicated.

NOTE: The Owner's Engineer review does not relieve the Supplier from any liability or responsibility for proper design, fabrication, or compliance with this Specification.

D. Design information shall be included on the Certified Drawings. The fact that such design information may later be included in the instruction and/or operating manuals does not relieve the Supplier from compliance with this requirement. Where standard drawings are furnished which cover a number of variations of the general class of equipment, each such drawing shall be individually endorsed to describe exactly which parts of the drawing apply to the equipment being furnished. Such endorsement shall also include the job name, purchase order/Contract number, and serial number of the particular item covered. Separate sheets of paper bearing this endorsement will not be acceptable.

E. Final Record: Two (2) final record documentation sets shall be submitted no later than ten (10) days following the final test of equipment. Any modifications required during the warranty period shall be accompanied by revised final documentation as required to update the copies furnished. Final documentation shall be labeled on the outside with Owner's name and location, description, order numbers, shop numbers, etc.

F. Prints and Instruction Books: Drawings shall be legible and shall be referenced as to project, purchase order number, etc. Final drawings, instruction books, parts data, etc., shall be indexed and bound into a common binder. The cover sheet shall reference the project. Legible drawings and data submitted to Owner shall be of such quality that said drawings and data shall be capable of yielding hard copy reproductions with every line, character, and letter clearly legible.

G. All final drawings and documents, except reproducible drawings, shall be bound in the instruction book with complete order data and index. All final drawings shall be complete with test values.

H. Final (Certified) Drawings shall be issued in the instruction books. As-built drawings shall be issued to replace all drawings in each instruction book only when said drawings have been modified.

I. Documents submitted to Owner that do not conform to the requirements of this Specification shall be subject to rejection by Owner. Supplier shall resubmit conforming documents. If conforming submittals cannot be obtained from the source documents, such source documents shall be retraced, redrawn, or photographically restored as may be necessary to meet such requirements. Supplier's failure to initially satisfy the legible quality requirements herein set forth, will not relieve Supplier from meeting the required schedule for submittal or drawings and data.

J. Mailing of Drawings and Data:

1. Approval drawings, etc., shall be transmitted by First Class mail, overnight by a suitable carrier, or email to the Engineer and Owner as follows:

Mr. Zachary R Marsden, P.E.
Toth and Associates
1550 E. Republic Road
Springfield, MO 65804
Phone: (417) 888-0645
zmarsden@tothassociates.com

Mr. Doug Root
Marshall Municipal Utilities
75 E. Morgan Street
Marshall, MO 65340
Phone: (660) 886-6966 ext. 1300
droot@mmumo.net

2. A letter of transmittal must accompany drawings, data, etc. All transmittals received without a letter of transmittal containing such information will be returned to sender. In his letter, the Supplier may include other pertinent data or information.

NOTE: No payment will be made until all drawings and test reports have been received by the Engineer. Owner will not pay interest or assessments if payment is withheld due to Supplier's delay in fulfilling his entire obligation.

K. Electronic Copies of Drawings and Data:
1. All final drawings shall be furnished as AutoCAD® drawing files on CD. AutoCAD® (.dwg format) version 2019 is the preferred format, version 2015 minimum. CD shall be marked with the AutoCAD® software version number.
2. Electronic copies of the final instruction book shall be furnished in Acrobat® Adobe® (.pdf format) in addition to the paper copies furnished.
3. Electronic copies of all test reports shall be furnished in Acrobat® Adobe® (.pdf format) in addition to the paper copies furnished.

L. Two (2) certified copies of all tests shall be furnished by the Supplier, included in each copy of the instruction book.

M. A representative of Owner shall be allowed an opportunity to witness any or all tests. Notify Owner minimum four (4) weeks before testing.

N. Submittals shall include, but shall not be limited to, the following:
1. Enclosure design, layout, detail, and construction drawings:
   a. Base plan with dimensions and section views showing all lifting, grounding, and anchoring information.
   b. Interior floor plan with dimensions and section views showing all equipment, lighting, and external wiring entry openings.
   c. Exterior and interior wall elevations with dimensions and section views showing all door and equipment access openings, external wiring entry openings, and wall-mounted equipment.
   d. Roof exterior and interior plan with dimensions and section views showing all roof openings.

e. Shipping split weights (if applicable), assembled enclosure weight and foundation design information.
f. Gasketed, bus duct elevations with dimensions and sections views showing all equipment and connections.
g. Structural design calculations reviewed and sealed by an engineer registered in the State of Missouri.
h. Doors and hardware.
i. Grounding design, location, and routing.
j. Lifting plan for enclosure section unloading, including rigging diagrams and instructions.
k. Provide four (4) copies of all construction drawings to Owner for permitting. One (1) copy shall be reviewed and sealed by an engineer registered in the State of Missouri.

2. Mechanical and electrical equipment manufacturer's shop drawings and data:
a. HVAC and thermostat.
b. Interior and exterior lighting fixtures.
c. Wiring and control devices.
d. Distribution equipment, panelboards, disconnect switches, etc.
e. Interior temperature alarm thermostats.
f. Interior smoke alarms and relay modules.
3. Enclosure equipment and wiring identification; materials, methods, and nameplate schedules.
4. Wiring, conduit, and raceway system routing plans, sizing calculations, and details for lighting, receptacles, and equipment.
5. Wiring schedules, one-lines, schematics, wiring diagrams, and interconnection data.
6. Interior lighting and emergency lighting system design and calculations.
7. HVAC schematics and wiring diagrams.
8. HVAC equipment design and sizing calculations.
9. AC station service design and sizing calculations.
10. Certified factory and shop test reports.
11. Enclosure, equipment, and system warranties.
12. Instruction manuals (O&M manuals) for all equipment.
13. Wiring drawings indicating terminations of all installed wiring.

O. For product data submittals, number of copies submitted shall be as follows:
1. Initial Submittal: Electronic Adobe® ·pdf copy to Engineer and Owner.
2. Re-submittal: Electronic Adobe® ·pdf copy to Engineer and Owner.
3. Distribution: Two (2) copies to Engineer and Owner.

1.4 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance (O&M) data in accordance with Item 1.3 – Submittals.
1. Submit sample instruction manuals during drawing approval process to Engineer and Owner for review for limited purpose of checking for conformance with Contract requirements.
2. Provide operation and maintenance data. Submit two (2) sets of data bound into hard-back, post-type binders in 8-1/2 by 11-inch text pages. Snap-ring binders are not acceptable.
3. Prepare binder cover and spine with printed title as follows:

a. Manufacturer name.
b. Type of manual (instruction, operation, maintenance, etc.).
c. Equipment name.
d. Project name.
e. Contract name and number.

4. Internally subdivide binder contents with permanent page dividers, logically organized as described below, with tab titling clearly printed under reinforced laminated plastic tabs.
5. Operation and maintenance data books shall include:
   a. Table of contents.
   b. Appropriate design criteria.
   c. List of equipment.
   d. Parts list.
   e. Operating instructions.
   f. Maintenance instructions.
   g. Shop drawings and product data.
   h. Photocopies of warranties.
   i. Divider for Owner's insertion of test reports.
   j. CD-ROM containing all electronic final drawings and reports

B. O&M manuals shall include installation, operation, and maintenance instructions.
   1. In addition to the above, O&M manuals shall include all data listed in Item 1.3 - Submittals.

1.5 SPARE PARTS

A. The following spare parts shall be furnished and included in the base bid price:
   1. Two (2) LED fixtures that match the interior fixtures.
   2. Two (2) LED fixtures that match the exterior fixtures.
   3. Three (3) spare filters for wall-mount HVAC unit.
   4. One (1) quart or two (2) 16-oz aerosol cans of touch-up paint to match enclosure exterior finish.
   5. Two (2) sets of spare keys for switchgear enclosure entry doors. Keys and locks shall be patterned for Owner's master key pattern.

1.6 WARRANTY

A. The manufacturer shall warrant all equipment supplied against defects in material and workmanship and shall supply a copy of this standard warranty (18 months from date of shipment or 12 months from date of energization) with the proposal.

1.7 SHIPPING

A. General:
   1. Supplier shall be responsible for packaging, loading, delivery, or construction of the outdoor protected aisle switchgear enclosure and all equipment to the Owner's project site.
   2. The switchgear enclosure shall be shipped in pieces as applicable shipping laws and regulations allow. The Supplier shall be responsible for determining shipping routes based on container size and route restrictions pertaining to oversize loads.

Supplier shall be responsible for obtaining all necessary permits for delivery of the switchgear enclosure to the specified location.

3. Supplier is responsible for verifying the accessibility of the specified delivery location based on proposed shipping equipment. Supplier shall accommodate shipping equipment selection to existing site location constraints to greatest extent possible. If Supplier deems that any site modifications are necessary for delivery, such as fence removal, road improvement, trench reinforcement, etc., such modifications shall be clearly stated in the Supplier's proposal.
4. If required, wall-mounted or roof-mounted equipment (package heat pumps, ventilation fans, bus duct, etc.) may be removed for shipment, with openings in exterior walls or roof protected with watertight blank plates or exterior grade plywood.
5. All exterior doors shall be securely fastened to prevent opening during shipment.
6. All interior equipment shall be securely fastened in place to prevent movement during shipping.
7. Split section openings in powerhouse enclosure shall be structurally braced to prevent member deformation or collapse during shipping.
8. Split section openings shall be adequately weatherproofed and sealed to prevent water or dust entry during shipping.
9. Repair and/or replacement of any and all damage caused to the control enclosure during shipment shall be at the sole cost of the Supplier.

B. Unloading:

1. Upon arrival at the Owner's project site, the equipment sections will be unloaded onto a concrete foundation, leveled, aligned, and anchored. Unloading, leveling, alignment, and anchoring will be performed by the Supplier or Supplier's contractor. Supplier shall have necessary personnel onsite to supervise and direct offloading.
2. The Supplier shall be responsible for submitting a lifting plan for unloading the sections from the Supplier's delivery trucks. The lifting plan shall include detailed instructions for cable attachments to lifting points, sling arrangements and cable angles, spreader bar position, lift weights, etc.
3. The Supplier or Supplier's contractor shall be responsible for providing all labor (including supervision as required), material, tools, equipment, and hardware necessary for unloading and assembling the switchgear enclosure sections to provide fully assembled facilities, including, but not limited to:
    a. Crane
    b. Spreader bars.
    c. Cable slings.
    d. Shackles.
    e. Cable clamps.
    f. Lift lug extensions.
4. After enclosure section alignment and anchoring, the Supplier or Supplier's contractor will complete base, wall, and roof joint connections, and weatherproofing in accordance with Supplier's instructions and materials.

PART 2 PRODUCTS

2.1 OUTDOOR PROTECTED AISLE SWITCHGEAR ENCLOSURE

A. General:

1. The enclosure shall be a weatherproof, all metal construction, pitched roof design with structural steel base and insulated floor, walls, and ceiling.
2. The switchgear enclosure shall be shipped in pieces as applicable shipping laws and regulations allow. Terminal boxes shall be mounted at each side of the shipping split for easy reconnection of switchgear enclosure auxiliary and control wiring. The terminal boxes for shipping split wiring shall be wall or ceiling mounted.
3. The enclosure size and interior equipment arrangement shall generally be as specified herein and as shown on the attached Contract Drawings.
    a. Enclosure design shall include an unobstructed aisle at front of switchgear lineup for switchgear and circuit breaker operation, maintenance, and testing. Area shall not be restricted by wall-mounted enclosure electrical service or heating and air conditioning equipment.
4. The enclosure height design shall be as required to accommodate:
    a. Interior-mounted equipment height, access, maintenance, and clearances.
    b. Interior ceiling-mounted lighting fixtures and devices.
    c. Enclosure entry and equipment exterior access.
    d. Minimum interior headroom clearance height of 96 inches above floor at lowest point (not including light fixture depth).

B. Loading Design:

1. The structural system shall, at a minimum, be designed to meet the requirements of the International Building Code (IBC) 2021 Edition. The Risk Category for the Structure is IV.
2. Roof Load: Minimum 65 pounds per square foot (psf) total load, consisting of self-weight, plus 10 psf collateral dead load, plus 25 psf ceiling-mounted equipment/lighting system load allowance and 30 psf live load. The roof shall also be capable of supporting a 300-pound point load in accordance with the IBC. Minimum design load shall be increased as required by gasketed bus duct loading and ceiling loading.
3. Roof Snow Load: Ground Snow Load (p_g) of 20 psf, Importance factor of 1.1, and snow drift in accordance with the IBC.
4. Horizontal Wall Load: Minimum 30 pounds per square foot (psf); increase as required by maximum specified wind velocity loading and wall-mounted equipment load.
5. Floor Load: Minimum self-weight plus 250 pounds per square foot (psf) live load; freestanding equipment floor areas shall be greater if required by the equipment static and dynamic load.
6. Wind loads shall be determined in accordance with the applicable codes based on the following criteria:
    a. Exposure Category = C
    b. Basic Wind Speed = 121 mph
    c. Topographic Factor $K_{zt} = 1.0$
    d. Directionality Factor $K_d = 0.85$
7. Seismic loads shall be determined in accordance with the applicable codes based on the following criteria:

a. Seismic Importance Factor = 1.5
b. S_1 = 0.078g
c. S_s = 0.121g
d. S_{DS} = 0.129g
e. S_{D1} = 0.124g
f. Site Class = D

C. Base:
1. Welded ASTM A36 structural steel I-beam construction rigidly braced for enclosure lifting and jacking. The base shall be designed for installation on a pad foundation.
2. The base shall be designed to withstand all shipping and erection loads in addition to enclosure and equipment dead and live loads.
3. Base design shall be rigidly braced as required to support personnel and equipment loading without causing floor to bend or sag.
4. The bottom of the base shall be covered with a corrosion-resistant undercoating.
5. Base anchor bolt plate shall be provided. Preferred method of anchoring is anchor bolts and clips.
6. External perimeter lifting lug or eye provisions for four-point top lifting.
7. External NEMA two-hole design, stainless steel grounding pads shall be provided at each corner, four (4) total.

D. Floor:
1. Minimum 1/4-inch thick, ASTM A36 steel plate, welded to base structural members.
2. Floor design shall be as required to support the personnel and equipment loading without causing floor to bend or sag.
3. Floor design shall include all openings with gasketed, steel cover plates at enclosure and equipment external conduit and wiring entry areas.
4. Structural floor bracing shall be arranged to maximize the size of floor openings.
5. The bottom of the floor shall be covered with a corrosion-resistant undercoating.
6. The complete floor area shall be insulated, including areas under equipment.
7. A non-skid paint system shall be applied to unobstructed aisle, and storage areas.

E. Walls:
1. Minimum 11-gauge, continuous seam-welded, weatherproof steel exterior panels.
2. Wall panels shall be continuous length from base to roof line of the enclosure at side and end walls.
3. Wall design shall consist of exterior and interior panels, with space between for insulation. Interior wall panels shall be minimum 14-gauge steel.
4. Exterior and interior wall designs shall be as required to support exterior- and interior-mounted equipment, devices, lighting fixtures, and raceway systems without compromising specified wind velocity loading.
5. Wall design shall include all door openings as required for enclosure entry, equipment access, and equipment removal/placement.
6. Walls shall be designed to carry the entire weight of conduit, wireway, and raceway systems fully loaded with cables and wires.

F. Roof:
   1. Gable roof design.
   2. Minimum 11-gauge, continuous seam-welded, weatherproof steel exterior panels.
   3. Roof panels shall be single continuous length from eave line to ridge line.
   4. Roof design shall consist of exterior and interior panels, with space between for insulation. Interior roof panels shall be minimum 14-gauge steel.
   5. Roof design shall include a minimum 2-inch overhang at all enclosure side and end walls.
   6. Roof design shall be as required to support all exterior bus duct, terminations and interior ceiling-mounted equipment, devices, lighting fixtures, and raceway systems.
   7. Roof design shall include all weatherproof openings, connection flanges, and supports for termination of bus duct.
   8. Bus duct connections to the switchgear main breaker shall be as specified in Assembly 15 - Medium-Voltage Circuit Breaker Switchgear.

G. Insulation:
   1. The enclosure shall be completely insulated, including floor areas under equipment and exterior walls.
   2. Insulation Design and Minimum Effective R-Value:
      a. Floor: Spray-on foam, fire-resistant design, R-25.
      b. Walls: Fiberglass, fire-resistant design, R-19.
      c. Roof/Ceiling: Fiberglass, fire-resistant design, R-38.

H. Doors:
   1. General:
      a. Provide enclosure entry and equipment access doors as specified herein and as shown on Drawings.
      b. Provide one (1) enclosure entry door at each end of the enclosure.
      c. Provide exterior, full height, hinged access doors for rear access to each switchgear vertical section.
   2. Each entry access door into the powerhouse switchgear enclosure and each exterior access door into the rear cable section of switchgear shall have a sign or signs mounted on the exterior face reading “DANGER - AUTHORIZED ACCESS ONLY”.
   3. Design:
      a. Enclosure entry doors shall be minimum 11-gauge, double wall, seamless steel construction with R-19 rated, 1.5-hour fire-resistant, thermal insulation core.
      b. All doors shall open outward and have a minimum swing of 105 degrees.
      c. Two (2) 48-inch wide by 84-inch high door for switchgear enclosure entry access.
      d. Enclosure entry doors shall be furnished with all steel construction frames, weatherproof stripping, thresholds, watersheds, and exterior drip caps/rain shields extending 3 inches past doors.
      e. Rear equipment access doors shall be minimum 11-gauge steel, three-point latch, padlockable, and gasketed design with vault handle, door stop, and rainshield. Top and bottom filter boxes with back-to-back louvers with intervening filter shall be provided in each door.
   4. Hardware:

a. Enclosure entry doors shall be furnished with interior panic-type, touch bar-exit device, hinges, screw hardware, and exterior keyed entry handle.
b. Enclosure entry doors shall be furnished with hydraulic door closer with hold-open feature.
c. All enclosure entry and equipment access door hardware shall be stainless steel.
d. Enclosure entry door locks shall be equipped with cylinder locks keyed alike. Keys shall be patterned for Owner's master key pattern.
e. Provide two (2) spare sets of keys in accordance with Item 1.5 – Spare Parts.

I. Painting:
1. Exterior: ANSI-61, light gray.
2. Interior:
a. Floor: Non-skid epoxy, ANSI 61, light gray.
b. Walls and Roof/Ceiling: High-gloss white.

2.2 ENVIRONMENTAL CONTROL

A. General:
1. The purpose of the environmental control system is to provide a regulated temperature inside the switchgear enclosure during outside ambient temperature extremes.
2. The environmental control equipment shall be designed, sized, installed, wired, and tested by the Supplier.
3. The environmental control system shall maintain interior temperature at maximum 77 degrees F in the summer and minimum 60 degrees F in the winter. Ambient temperature extremes for environmental system design and equipment selection shall be based on historical weather data for Marshall, Missouri.
4. The environmental control equipment shall consist of a 100 percent rated semi-flush, wall-mounted packaged heat pump or dual 75 percent rated heat pumps as manufactured by Bard.
5. Heat pumps shall be sized and selected to maintain the temperatures indicated above based on local historic ambient temperatures and heat load of present and future enclosure equipment. Minimum capacity ratings for heat pump units shall be 34,000 BTUH cooling and 35,400 BTUH heating in reverse cooling mode.
6. Each unit shall have an integral supplemental electric heater, minimum 10 kW, circuited with a separate branch circuit supply.
7. Each package heat pump shall include integral controls and circuit protective devices, high pressure compressor cutoff, adjustable barometric damper with washable filter, and a disposable, pleated return air filter.
8. Each package heat pump shall be provided with extruded aluminum, fixed blade supply and return air grilles.
9. Each package heat pump shall be continuously energized and controlled by a single wall-mounted thermostat controller with sub-base, adjustable temperature setting, and automatic changeover from heating to cooling.
10. Package heat pump enclosures shall be provided with manufacturer's standard gray finish.
11. Each package heat pump unit shall be supplied by two (2) single-phase power circuits, one (1) for the heat pump cooling compressor and reverse cooling heating, and one (1) for the supplemental electric heater. Heat pump unit power

circuits shall be wired from the 120/240-volt AC, single-phase, three-wire AC distribution panelboard.

12. A two-stage mechanical thermostat with SPDT contacts and 30-degree F to 110-degree F adjustment shall be provided. The high temperature alarm shall be set at 84-degree F and the low temperature alarm shall be set at 50-degree F. The thermostat shall be Dayton 1UHH3, or equivalent.
13. Smoke alarms and associated relay modules shall be provided. Smoke alarms and relay modules shall be Kidde i12040A and SM120X, or equivalent.

2.3 INTERIOR AND EXTERIOR LIGHTING

A. General:

1. The interior and exterior lighting systems shall be designed, installed, wired, and tested by the Supplier.
2. The interior lighting system shall be designed to provide a minimum of 50 foot-candles average measured at the enclosure floor and a minimum of 30 foot-candles measured at the front of switchgear and wall-mounted equipment.
3. The interior lighting fixtures shall be ceiling mounted and located so as to not interfere with switchgear or equipment enclosure door swings, or cable raceways.
4. The interior lighting system shall be controlled by three-way, wall-mounted light switches installed at each door entrance.
5. The interior lighting system design shall also include self-contained battery pack emergency egress lighting.
6. Interior and exterior emergency egress lighting shall meet the minimum requirements of NFPA 101.
7. The emergency lights shall be automatically energized upon loss of voltage to the interior lighting branch circuit. A minimum of two (2) emergency light units shall be installed in the powerhouse enclosure, unless additional emergency lights are required to meet NFPA 101.
8. The exterior lighting system shall be designed to illuminate exterior door egress with one (1) fixture at each powerhouse enclosure door.
9. Exterior lighting shall be photocell controlled.

B. Design:

1. Interior Light Fixtures:
   a. 4-foot, industrial grade, ceiling-mounted, enclosed and gasketed LED fixtures with acrylic diffuser.
   b. LED fixtures shall have a 5,000K color temperature and a minimum 80 CRI. Fixture shall deliver a minimum of 3,500 lumens.
   c. Power Supply: 120 volt AC, three wire.
2. Emergency Light Fixtures:
   a. Self-contained, continuously charged, battery-powered fixtures with two (2) adjustable LED head lamps.
   b. Fixture battery shall be a 6-volt, nickel-cadmium type with capacity to maintain emergency lighting for a minimum of 1-1/2 hours.
   c. Power Supply: 120 volt AC, three wire.
3. Exterior Light Fixtures:
   a. Outdoor, wall-mounted, wet location, LED fixtures with integral photocell switch.

b. Outdoor fixtures shall be shielded type with downward light distribution to prevent direct exposure of the lamp when viewed from the horizontal plane.
c. Fixture paint finish to be similar to enclosure wall finish (gray).
d. Each outdoor light fixture shall be controllable by an interior wall-mounted switch to override the fixture photocell automatic on function.
e. Power Supply: 120 volt AC, three wire.

4. Lighting Control Switches:
   a. Rating: Minimum 120 to 277 volt AC, 20 amp.
   b. Industrial, heavy-duty, gray-colored, toggle-handle devices with grounding screw.
   c. Boxes shall be malleable iron, cast type with threaded conduit hub.
   d. Box covers shall be sheet steel.
   e. Boxes and covers shall have an electrogalvanized finish.

2.4 INTERIOR AND EXTERIOR RECEPTACLES

A. General:
1. The interior and exterior receptacle system shall be designed, installed, wired, and tested by the Supplier.
2. The interior receptacle system shall be designed to provide conveniently located wall-mounted duplex receptacles. The distance (measured along the wall) between consecutive receptacles shall not exceed 8 feet. A receptacle shall be installed near each door entrance.
3. The exterior receptacle system shall be designed to provide a minimum of two (2) flush, wall-mounted duplex receptacles. One (1) receptacle shall be installed at each door entrance.
4. All receptacles shall be installed 24 inches above the enclosure floor.
5. Exterior receptacles shall be protected by a common GFCI circuit breaker installed at the enclosure AC distribution panel.

B. Design:
1. Receptacles:
   a. Rating: Minimum 125-volt AC, 20-amp, three-wire grounding, NEMA 5-20R configuration.
   b. Industrial, heavy-duty, corrosion-resistant, ivory-colored, duplex devices.
   c. Interior box covers shall be sheet steel with an electrogalvanized finish.
   d. Exterior box covers shall be weatherproof, cast aluminum type with gasketed, weatherproof while in use, clear acrylic covers.

2.5 AC DISTRIBUTION SYSTEM

A. General:
1. An AC distribution system for the switchgear enclosure shall be designed, installed, wired, and tested by the Supplier.
2. The distribution system shall be designed to distribute power to all enclosure loads as specified herein.
3. Enclosure AC loads shall include the enclosure HVAC, interior and exterior lighting, receptacles, switchgear lineup space heaters and lights, bus duct heaters, and external control enclosure equipment.

B. Design:

1. The AC distribution system for the switchgear enclosure shall be 240/120-volt, 225-amp, single-phase, three-wire service design.
2. ~~2.~~ The AC distribution system shall provide AC distribution panelboard(s) with branch circuit overcurrent protection.
3. ~~3.~~2.

C. AC Distribution Panelboards:

1. Provide design required quantity of 240/120-volt, 225-amp, 42-pole minimum, 60-pole maximum, single-phase, three-wire, solid-neutral, surface-mounted panelboards.
2. Panelboard shall be a NEMA PB1, fully rated, service entrance, circuit breaker design.
3. Panelboard enclosure shall be a surface-mounted, NEMA 1 design with front trim cover. The front trim cover shall be a concealed clamp or screw attached design with hinged door equipped with flush lock.
4. Panelboard bus shall be tin-plated copper with 225-amp main breaker design. If design requires multiple panelboards, panelboards shall include sub-feed lugs.
5. Panelboard minimum branch circuit breaker rating shall be 15 amp. Branch breaker ratings shall be selected based on NEC requirements for dedicated loads and general service lighting or receptacle branch circuit loads.
6. Panelboard shall be furnished with full-capacity neutral bus and an equipment grounding bus.
7. Panelboard bus and all circuit breakers shall have a minimum short circuit rating of 10,000 amps RMS symmetrical. Series rating of branch breakers is not allowed.
8. Circuit breakers shall be NEMA AB1, molded case, bolt-on, thermal magnetic trip design.
9. All available unused panelboard branch spaces shall be provided with 20-amp single-pole breakers designated in directory as “SPARE”.
10. Panelboard shall be furnished with a typed circuit directory.
11. Panelboard enclosure box, interior, and front trim cover shall be painted the manufacturer's standard gray enamel.
12. Panelboards shall be installed to enclosure wall on a mounting rack, constructed from Unistrut P-1000 series channel. Rack shall be galvanized or stainless steel and include all necessary fittings, anchors, hardware, etc. for mounting equipment.
13. Manufacturer: Square D, Eaton Cutler Hammer, GE, or approved equivalent.

2.6 DC DISTRIBUTION SYSTEM

A. General:

1. A DC distribution system for the switchgear enclosure shall be designed, installed, wired, and tested by the Supplier.
2. The distribution system shall be designed to distribute DC power to all switchgear enclosure DC loads.
3. Enclosure DC loads shall include the switchgear lineup circuit breaker close and charging motor circuits, and trip circuits.

B. Design:

1. The DC distribution system for the switchgear enclosure shall be 125-volt, 100-amp minimum, two-wire ungrounded design. The DC distribution system shall be designed to be supplied from Owner's existing control building.
2. The feed(s) to the enclosure power panelboard(s) shall be from the Owner's existing control building to the top of the panelboard(s). Supplier shall ensure sufficient provisions (raceways, lugs, etc.) are provided for these feeds.

C. DC Distribution Panelboards:
1. Provide design required quantity of 125-volt DC, 100-amp, 48-pole minimum, 60-pole maximum, surface-mounted panelboards.
2. Panelboard shall be a NEMA PB1, fully rated, circuit breaker design.
3. Panelboard enclosure shall be a surface-mounted, NEMA 1 design with front trim cover. The front trim cover shall be a concealed clamp or screw attached design with hinged door equipped with flush lock.
4. Panelboard bus shall be tin-plated copper with 100-amp main breaker design. If design requires multiple panelboards, panelboards shall include sub-feed lugs.
5. Panelboard bus and all circuit breakers shall have a minimum short circuit and interrupt rating of 10,000-amps DC.
6. Panelboard branch circuit breakers shall be two-pole with amp rating selected to match branch circuit requirements.
7. All available unused panelboard branch spaces shall be provided with 20-amp, two-pole breakers designated in directory as "SPARE".
8. Circuit breakers shall be NEMA AB1, molded case, bolt-on, thermal magnetic trip design.
9. Panelboard shall be furnished with a typed circuit directory.
10. Panelboard enclosure box, interior, and front trim cover shall be painted the manufacturer's standard gray enamel.
11. Panelboards shall be installed to enclosure wall on a mounting rack, constructed from Unistrut P-1000 series channel. Rack shall be galvanized or stainless steel and include all necessary fittings, anchors, hardware, etc. for mounting equipment.
12. Manufacturer: Square D, Eaton Cutler Hammer, GE, or approved equivalent.

2.7 GROUNDING

A. The Supplier shall design, furnish, and install an enclosure, equipment, and raceway grounding system.

B. Enclosure Grounding:
1. Furnish and install at each enclosure corner at the base an external, accessible ground pad.
2. Ground pads shall be stainless steel, drilled and tapped, NEMA two-hole connection design.
3. An exposed ground bus (intact rectangular bus bar) shall be installed inside the enclosure, approximately 12 inches above the floor along the side wall of the enclosure.
4. The ground bus shall be fully insulated from the DC distribution system at all points of attachment.
5. The interior ground bus shall also be physically connected to the assembled switchgear neutral bus in one location.

6. All spliced connections of the ground bus bar shall be accessible to allow bolting/unbolting and inspection.

C. Equipment Grounding:
1. All equipment, panels, and enclosures shall be connected to the enclosure grounding system by direct copper conductor connections.
2. All AC and DC loads, lighting, receptacles, heat pump unit(s), and ventilation system equipment shall be grounded by an insulated equipment-grounding conductor carried with the power circuit conductors.
3. The metal raceway system and enclosure steel shall not be considered as an equipment grounding or power system grounding conductor.
4. Furnish and install grounding lugs in each feeder cubicle.

D. Power System Grounding: Furnish and install enclosure AC service grounding by direct copper conductor connection to the enclosure grounding system.

E. Conduit and Raceway System Grounding:
1. Ground at all terminal points.
2. Bond conduit to enclosures with a grounding bushing connected by copper conductor to the metal enclosure or the equipment ground bus.
3. Maintain ground continuity along entire conduit and raceway run by copper conductor or mechanical connection bonding.
4. Flexible metallic conduit shall be bonded by copper conductor connected to grounding fittings at each end.

F. Grounding Materials:
1. Conductors shall be copper. 8 AWG and smaller shall be solid construction. 6 AWG and larger shall be stranded.
2. Bus work shall be copper bar. Minimum size shall be 1/4 inch by 2 inch.
3. Conductor connections shall be tin-plated copper compression lugs. Bolts shall be silicon bronze with lock washers.
4. All grounding materials shall be listed and classified by Underwriters Laboratories, Inc. as suitable for grounding.

G. Grounding Installation:
1. Install ground conductor continuous from termination point to termination point.
2. Where exposed, protect and support conductors and bus work at minimum 3-foot intervals.
3. All connections shall be low-resistance with a resistance drop of less than 1 ohm.
4. Design, size, support, and install grounding in accordance with the National Electrical Code.

2.8 WIRING, CONDUIT, AND RACEWAY SYSTEMS

A. General:
1. The Supplier shall design, furnish, and install all wiring, conduit, and raceway systems to provide a functional enclosure as specified herein.
2. All enclosure AC service distribution and branch circuit wiring shall be installed in conduit or wireway.
3. All enclosure DC service distribution and branch circuit wiring shall be isolated and segregated in dedicated conduit runs.

4. Where flexible wiring connections are required, wiring shall be installed in liquidtight, flexible-metal conduit.
5. Terminate all conduit runs at equipment and panels with grounding bushings.
6. Install conduit hubs where conduit runs terminate at the top of equipment and panels.
7. Terminate conduit runs at equipment, panels, wireways, enclosures, and boxes with a minimum of two (2) locknuts.
8. Provide equipment and floor openings for conduit and wiring entry.
    a. Floor openings for power conductor entry into the bottom of feeder cable sections and for conductor entry into the bottom of the interior cable riser shall be provided with removable metal plates and cantilevered over the structural base rails.
9. Design, size, support, and install wiring, conduit, wireway, and raceway systems in accordance with the National Electrical Code.
10. Cable tray shall be sized, provided and installed as shown on the Contract drawings.

B. Conduit:
1. Minimum Size: 3/4 inch.
2. Exposed conduit shall be rigid, hot-dipped, galvanized steel or intermediate metal conduit (IMC).

C. Conduit Bodies, Boxes, and Fittings:
1. Conduit bodies, boxes, and fittings shall be ferrous metal.
2. Conduit bodies and boxes shall be malleable iron, cast type with threaded hubs and gasketed, steel screw covers.
3. Locknuts shall be malleable iron or steel.
4. Bushings shall be insulated, malleable iron or steel design.
5. Grounding bushings shall be insulated, malleable iron or steel design with bronze lug.
6. Conduit hubs shall be malleable iron, raintight type with recessed O-ring gasket.

D. Liquidtight Flexible-Metal Conduit:
1. Interlocked galvanized steel core construction with PVC jacket.
2. Continuous copper ground built into core.
3. Malleable iron fittings with sealing rings.
4. Grounding fittings shall be furnished with integral cast lug.
5. Conduit and fittings shall be UL listed for grounding.

E. Wireway:
1. Furnish and install a minimum 4-inch by 4-inch wireway for AC service branch circuit wiring from the enclosure distribution panelboards.
2. Wireway shall be wall mounted near the enclosure ceiling line.
3. Wireway shall extend the full enclosure perimeter of all accessible walls.
4. Wireway shall be NEMA 1, lay-in, painted steel construction.

F. Cable Tray:
1. Description: NEMA VE 1, Class 20C ladder-type cable tray.
2. Material: Cable tray system components, including straight sections, fittings, splice plates, divider strips, covers, hardware, etc., shall be constructed of aluminum.

3. Inside Width: Supplier to size with input from Engineer on field cabling.
4. Inside Depth: 6 inches (minimum).
5. Straight Section Transverse Member (Rung) Spacing: 9 inches on center.
6. Transverse members (rung) shall have a minimum cable bearing surface of 3/4 inch.
7. Inside Radius of Fittings: 12 inches (minimum).
8. Furnish all vertical and horizontal fittings required to make a complete installation.
9. Fittings shall be designed to provide the same load capacity as straight sections.
10. Fittings cross-sectional dimensions shall be compatible with straight sections.
11. Provide manufacturer's standard clamps, hangers, brackets, splice plates, reducer plates, blind ends, barrier strips, connectors, and grounding straps.
12. Coordinate tray routing as required for location of interior cable tray riser for field cable.
13. Furnish vertical ladder cable tray riser on inside of building and connect with radius tray to overhead tray system. Indoor tray riser shall continue to base of building at conduit entry for interface to Owner installed conduits.
14. Vertical tray riser shall be furnished with a ventilated tray cover and a metal plate to cover the conduit entry around the riser tray.
15. The tray support system shall be designed to support the cable tray and all cabling installed.
    a. Mount tray to provide a minimum 12 inches between top of tray system and enclosure ceiling.

G. Wiring:
1. All wire and cable shall be installed in conduit or wireway.
2. Control Cable:
    a. Multi-conductor cable used for connections between control and relay panels and local devices. Color coding shall be ICEA Method No. 1, Table E-2.
    b. Minimum Size: 14 AWG, copper.
    c. Insulation: Cross-linked, thermosetting polyethylene (XLPE).
    d. Jacket: Chlorinated polyethylene (CPE).
    e. Cable shall be cable tray rated.
    f. Cable shall meet ICEA Standard S-73-532 (NEMA WC 57).
3. Lighting, receptacle, and dedicated branch circuit wiring:
    a. Minimum Size: 12 AWG, copper.
    b. 600 volt, thermoplastic, 90 degrees C dry or wet location insulation.
    c. Type: THHN/THWN-2 or XHHW-2.
4. DC power feeders and equipment branch circuit wiring:
    a. Minimum Size: 10 AWG, stranded copper.
    b. 600 volt, thermoset, 90 degrees C dry or wet location insulation.
    c. Type: XHHW-2.
5. Control circuit wiring:
    a. Minimum Size: 12 AWG, stranded copper for potential circuits, 10 AWG, stranded copper for current circuits.
    b. 600 volt, thermoset, 90 degrees C dry or wet location insulation.
    c. Type: XHHW-2.
6. Neatly train, bundle, circuit group, and lace wiring inside wireways, equipment, and panels.

7. Wiring shall be continuous from termination point to termination point without splices.
8. At equipment without integral set-screw or clamp-type connectors, terminate wiring with compression-type, rectangular or ring-tongue, tin-plated copper lugs.
9. Receptacles shall not be supplied from lighting branch circuits.
10. Branch circuit neutral and grounding conductors shall not be shared. Dedicated neutral and grounding conductors shall be installed for each branch circuit.
11. All compression type terminations shall be completed with ratchet type non-reversible tool made by the same company as the terminals (Panduit or approved equivalent).

H. Bus Duct:
1. Furnish and install a gasketed, roof-mounted bus duct that will connect directly from the power transformer low-voltage bushing throat flange to the outdoor-protected aisle enclosure roof. The bus duct attachment to the transformer shall be designed to match the transformer manufacturer's specific requirements. The bus duct shall be structurally supported by the switchgear roof between the two connections.
2. The enclosed bus duct shall be rated 15 kV, 2,000 amp and all operating, insulating, and support requirements of the switchgear shall apply. Adequate heaters and vents shall be provided to allow for continuous operation at rated load and operating conditions.
3. Removable, access covers shall be provided at both the switchgear enclosure and transformer ends of the bus duct, and at routine intervals over the length of the bus duct to support maintenance and inspections of the bus duct interior.
4. Use of flexible conductor for connection between the bus duct and transformer low-voltage bushings is allowable as long as the ratings for the conductor meet the main bus ratings specified in the Assembly 15 (Medium-Voltage Circuit Breaker Switchgear) specification.

I. Electrical Identification:
1. Furnish and install nameplates to identify all equipment access doors, equipment, panels, disconnect switches, etc.
    a. Laminated plastic, white letters on a black background.
    b. Arial style, minimum 1/2-inch high lettering.
    c. Engraving designations shall be reviewed by the Engineer and Owner prior to manufacture.
    d. Secured with metal screws.
2. Furnish and install labels to identify all wiring.
    a. Printer-generated or typed, vinyl film, self-laminating, adhesive, wrap-around type.
    b. Character size shall be a minimum of 3/16-inch high.
    c. Labels, method of identification, and attachment shall be reviewed by the Engineer and Owner.
    d. Attach a wire-circuit identification label to each wire at terminal connection point, at termination entry point, and at all accessible points along the route.
    e. Wire identification shall match enclosure wiring diagrams.
    f. Wire markers with opposite end designation shall be used.
3. Furnish and install color coding to identify wiring service:
    a. Colored insulation shall be furnished for all wiring 6 AWG and smaller.

b. Conductors larger than 6 AWG shall be identified by half-lapped bands of colored tape applied at wiring terminations.
c. Color Code:
1) 240/120-Volt AC Phase Identification:
a) Black - L1
b) Red - L2.
c) White - Neutral.
d) Green or Bare - Grounding.
2) DC Identification:
a) Red - Positive
b) Black - Negative.

2.9 MISCELLANEOUS ACCESSORIES

A. General:
1. Provide the following accessories mounted and shipped with the outdoor protected aisle switchgear enclosure:
a. Class C, 20-lb, carbon dioxide fire extinguisher with metal bracket wall mounted next to each enclosure exit door.
b. Wall-mounted drop/lift wall racks and three 30” long hanging clamps at each rack for hanging Owner’s 24” X 36” drawings.
c. Wall-mounted equipment storage rack for special tools and spare switchgear equipment provided by Assembly 15 – Medium-Voltage Circuit Breaker Switchgear.

2.10 FACTORY AND SHOP TESTING

A. General:
1. Perform factory and shop production and quality control inspection and testing on the assembled outdoor protected aisle switchgear enclosure, equipment, systems, and wiring.
2. All inspection and testing shall be performed and completed at the factory and shop prior to shipment to ensure a fully functional enclosure package upon delivery.
3. Inspection and testing shall generally include, but shall not be limited to:
a. Visual inspection and mechanical operation of enclosure systems.
b. Operational testing of enclosure environmental equipment and systems.
c. Electrical testing and operational checkout of enclosure AC distribution equipment, lighting, and receptacle systems.
d. Electrical testing and operational checkout of enclosure DC distribution equipment.

B. Witness Testing and Factory Inspections:
1. The Owner reserves the right to witness factory and shop testing of the assembled outdoor protected aisle switchgear enclosure.
a. The Supplier shall notify Owner a minimum of four (4) weeks prior to the date when factory and shop testing will begin.
2. The Owner reserves the right to factory and shop-inspect the assembled outdoor protected aisle enclosure prior to any disassembly and packaging for shipment.

a. The Supplier shall notify Owner a minimum of four (4) weeks prior to the date when assembled inspection will be allowed.

3. The Supplier shall be responsible for making any corrective changes to the enclosure that is not in compliance with Specifications, Drawings, or Submittals documents prior to shipment.

C. Test Results:

1. The Supplier shall notify the Owner of any unusual event or damage occurring during the fabrication and assembly of the enclosure and of all tests which do not meet specified standards. The Owner reserves the right to inspect such damages or test failures. Corrective measures to overcome such damage or failure shall be subject to acceptance by the Owner.
2. Two (2) copies of the certified test report shall be delivered to the Owner not later than ten (10) days after completion of all factory and shop tests.
3. A copy of the test report shall also be included in each copy of the Contract Operation and Maintenance (O&M) manual.

2.11 PROJECT MILESTONES

A. Work is to be in accordance with the following project milestone dates. Dates are tentative.

1.	Advertise for Bid	04/10/2025 to 05/08/2025
2.	Available to Bidders	April 10, 2025
3.	Bid Opening	May 8, 2025
4.	Recommendation and PO Issued	June 5, 2026
5.	Delivery to Project Site	August 31, 2026

B. This Schedule is prepared for the Bidder's information and convenience of understanding the content and scheduling of the work. Contractor shall prepare and submit his schedule in taking indicated information into account. Modifications in the Bidder's schedule shall be reviewed for approval by Owner.

C. Owner will not accept delivery before the window stated in Item 2.11-A.5. The Supplier shall be responsible for storage facilities and fees if the Supplier completes the manufacturing before the delivery window.

D. Owner may elect to request storage of the enclosure at Supplier's facility for up to six (6) months after the delivery date stated in Item 2.11-A.5. Supplier shall provide pricing for these storage durations as requested on the Bid Form, and any Supplier terms and conditions for storage of this equipment.

E. Should the Supplier neglect, refuse, or fail to deliver the material within the time set forth above, or any proper extension thereof granted by the Owner, the Supplier shall pay to the Owner $1,000 (One Thousand Dollars) per day for each and every day that such delivery is delayed beyond the specified time. Said obligation of the Supplier is not a penalty, but is liquidated damages for loss to the Owner and the public, after the expiration of the time stipulated in the purchase agreement, as adjusted by duly executed change orders, and will be deducted from any money due the Supplier under this purchase agreement. The Supplier and surety of record shall be liable for any and all liquidated damages. Nothing contained herein shall preclude claims by the Owner for

damages caused by Supplier errors, omissions, or negligence unrelated to delay in delivering within the time for completion in the purchase agreement.

PART 3 EXECUTION

3.1 SUPPLIER'S FIELD SERVICES

A. The Supplier shall be responsible for providing factory-trained service personnel at the project site to supervise and perform equipment unloading, positioning, alignment, leveling, anchoring, connection, interior wiring reconnections, and weatherproofing the outdoor protected aisle switchgear enclosure. The Supplier's site personnel shall be familiar with the unloading and erection procedures for the equipment supplied and have previous experience performing and supervising similar projects. The Supplier's price shall include all costs associated with the field service activities, including, but not limited to materials, tools, equipment, hardware, travel expense, lodging, meals, and man-hours for the field service site personnel.

B. Additional trips to the site shall be reimbursed only if trip was requested in writing by the Owner. Provide technical assistance for inspection, installation, adjustment, testing, and initial energization. Provide on-site training and instruction in the operation and maintenance techniques pertaining to the equipment. Correct all wiring and other manufacturing errors discovered in the field promptly and at no cost to the Owner.

C. Submit a written inspection and test report to the Owner, with a signed statement that the equipment has been properly installed, tested, and is ready for energization.

D. If equipment arrives with visible damage or probable hidden damage, the Supplier's field service personnel shall inspect the equipment and make repairs as required. Such trip costs and related expenses shall be borne by the Supplier. Forward a written report to the Owner and have the field service personnel itemize the damage incurred.

E. Documentation: Two (2) copies of the field services report shall be delivered to the Owner not later than five (5) days after completion of all field services.

END OF SECTION

Exhibit E:

Drawings

drawings provided under separate cover
incorporated by reference

ER-101	SWITCHGEAR NO. 1 RELAY ONE LINE
ER-300	SWITCHGEAR NO. 1 ELEVATIONS
ER-301	SWITCHGEAR NO. 1 UNIT 1 BREAKER 1 EQUIPMENT LAYOUT
ER-302	SWITCHGEAR NO. 1 UNIT 2 AUXILIARY EQUIPMENT LAYOUT
ER-303	SWITCHGEAR NO. 1 UNIT 3 BREAKER 3 EQUIPMENT LAYOUT
ER-304	SWITCHGEAR NO. 1 UNIT 4 BREAKER 4 EQUIPMENT LAYOUT
ER-305	SWITCHGEAR NO. 1 UNIT 5 BREAKER 5 EQUIPMENT LAYOUT
ER-306	SWITCHGEAR NO. 1 UNIT 6 BREAKER 6 EQUIPMENT LAYOUT
ER-307	SWITCHGEAR NO. 1 UNIT 7 BREAKER 7 EQUIPMENT LAYOUT
ER-308	SWITCHGEAR NO. 1 UNIT 8 BREAKER 8 EQUIPMENT LAYOUT
ER-309	SWITCHGEAR NO. 1 UNIT 9 BREAKER 9 EQUIPMENT LAYOUT
ER-310	SWITCHGEAR NO. 1 UNIT 10 BREAKER 10 EQUIPMENT LAYOUT
ER-311	SWITCHGEAR NO. 1 UNIT 11 EQUIPMENT LAYOUT
SE-301	SWITCHGEAR ENCLOSURE LAYOUT

Exhibit F:

Switchgear Supplement

SWITCHGEAR SUPPLEMENT

GENERAL

1.1 SUMMARY

A. This Section includes the Bidder's price proposal breakdown and data to be submitted with the bid.

1.2 BID PRICE

A. BASE BID NO. 1: OUTDOOR SWITCHGEAR

1. Supply 15-kV metal-clad switchgear lineup in outdoor protected aisle enclosure with all auxiliary equipment as specified herein, completely manufactured, wired, tested, and shipped to project site with standard warranty (18 months from date of shipment or 12 months from date of energization) in accordance with the bidding documents for the following firm price:

_____($_____)

B. BASE BID NO. 2: TECHNICAL FIELD SERVICES

1. Furnish on-site technical services, including all labor, material, tools, equipment, and hardware, as required to supervise and perform equipment unloading, switchgear enclosure alignment, leveling, anchoring, enclosure connections and weatherproofing, and interior wire reconnections for the following firm price and additional time rates:

_____($_____)

a. Per-diem rate (eight-hour day) for all labor and expenses, exclusive of round-trip travel for additional time if requested by Owner:

_____($_____)

b. Round-trip travel expense, per trip for additional time if requested by Owner:

_____($_____)

C. OPTION BID NO. 1 - TRAINING SERVICES FOR THE 15-KV VACUUM BREAKERS

1. Furnish on-site training services, if requested by Owner for the following rates:

a. Per-diem rate (eight-hour day) for all labor and expenses, exclusive of round-trip travel:

_____($_____)

b. Round-trip travel expense, per trip:

_____($_____)

D. OPTION BID NO. 2: EXTENDED WARRANTY
Provide an extended 12 month warranty beyond the standard warranty of 12 months from date of energization for all equipment supplied by this specification for the following firm price:

_____($_____)

E. OPTION BID NO. 3: FIRE WALL
Provide a two hour rated firewall only on the side of the enclosure facing the transformers for the following firm price:

_____($_____)

F. OPTION BID NO. 4: FIRE ROOF/CEILING
Provide a two hour rated fire roof/ceiling on the enclosure for the following firm price:

_____($_____)

G. OPTION BID NO. 6: ENCLOSURE STORAGE
Provide storage of the enclosure, if requested by Owner, for up to 6 months after completion for the following firm prices:

1 month storage _____($_____)

2 months storage _____($_____)

3 months storage _____($_____)

4 months storage _____($_____)

5 months storage _____($_____)

6 months storage _____($_____)

1.3 BID PRICE BREAKDOWN

A. The Bidder shall provide the following estimated price breakdowns on Base Bid No. 1. The price breakdowns shall total the Base Bid No. 1 price. The intent of these itemized prices is for internal project accounting purposes and for evaluating the Bidder's understanding of the Contract scope. These itemized prices will not be used for adjusting the Contract price.

1. 15-kV metal-clad switchgear lineup with breakers, relaying, controls, etc:
_____($_____)

2. Outdoor protected aisle enclosure structure and miscellaneous enclosure accessories including, but not limited to, lighting, receptacles, switches, wall-

mount HVAC units, AC panelboards, and DC panelboards, all completely installed and wired prior to shipment:
_____($_____)

3. Delivery costs to site:
_____($_____)

1.4 SCHEDULE

A. The Bidder shall submit the following schedule by filling in the blanks provided (in days after receipt of order):

1. Outdoor Switchgear:
   a. Outdoor switchgear dimensioned plan drawings _____
   b. Outdoor enclosure base framing drawings _____
   c. One-line diagram _____
   d. Three-line diagram _____
   e. Switchgear panel elevations _____
   f. Switchgear panel cross sections / bus layouts _____
   g. Nameplate schedules _____
   h. Bills of material _____
   i. Equipment data sheets _____
   j. Breaker DC control schematics _____
   k. Accessory AC control schematics _____
   l. Accessory DC control schematics _____
   m. Individual switchgear section wiring diagrams _____
   n. Initial submittal of O&M manual _____
   o. All material delivered to site _____

1.5 INFORMATION TO BE SUBMITTED WITH BID

A. The Bidder must furnish the information requested to allow the Owner to evaluate the bids. Failure to furnish all information may disqualify bid.

B. Preliminary dimensioned outline drawing and cross section of outdoor-protected aisle switchgear enclosure indicating:
   1. Overall enclosure length, width, and height.
   2. Interior aisle width dimension from front of switchgear to opposite wall.
   3. Location of interior auxiliary equipment.
   4. Location of shipping split(s), if applicable.
   5. Estimated shipping weight of each section.
   6. Preliminary details of base dimensions and anchoring requirements.

C. Switchgear Details:
   1. Vacuum breaker manufacturer _____
   2. Vacuum breaker model or type _____
   3. Vacuum breaker interrupt ratings _____
   4. Breaker remote racking device manufacturer and model _____

5. Switchgear Cubicle:
   a. Height, inches _____
   b. Width, inches _____
   c. Depth, inches _____

D. In addition to the specific information requested above, Bidder shall furnish complete descriptive information with the bid, sufficiently detailed to determine if the systems being offered meet the requirements of the Specifications.

1.6 CLARIFICATIONS AND EXCEPTIONS

The UNDERSIGNED declares that the following list states any and all variations from and exceptions to the requirements of the Contract Documents and that otherwise it is the intent that the work will be performed strictly in accordance therewith. If no exceptions are taken, state "NONE". (Note: Use separate page(s), if necessary.) If left blank, "NONE" will be recorded.

_____

_____

_____

_____

THE UNDERSIGNED hereby agrees to complete the entire work covered by this proposal in accordance with the schedule milestones in the Contract Documents. For every day the Notice of Award is delayed, the completion dates will be adjusted the same.

1.7 THE UNDERSIGNED understands that the right is reserved by Marshall Municipal Utilities, Marshall, Missouri, to reject any and all bids.

1.8 The Bidder is prepared to submit a financial statement on request.

1.9 The Bidder acknowledges receipt of Addendum No(s). _____.

_____
Bidder

_____
By

_____
Title

_____
Attest

_____
Date

_____

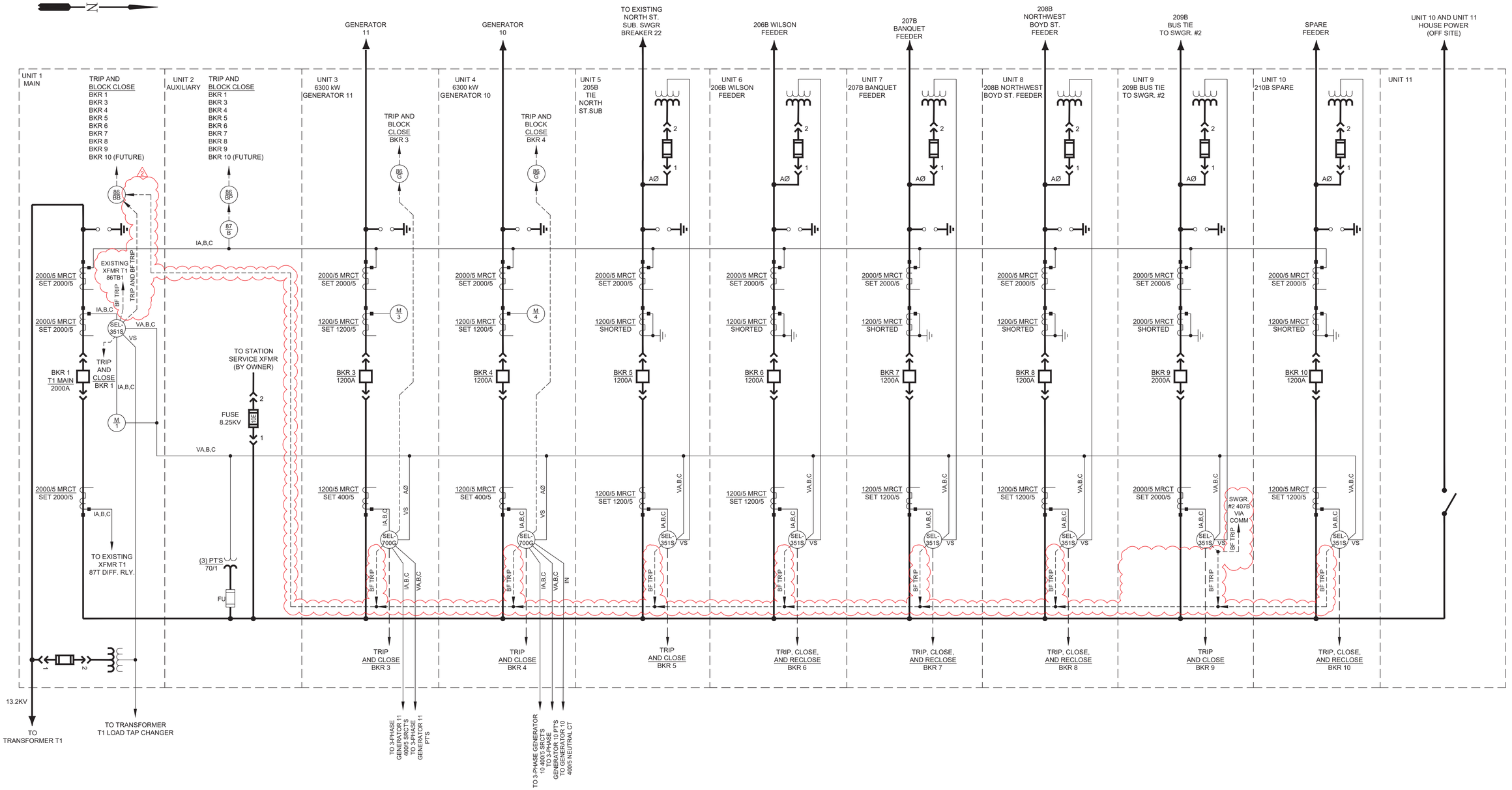
_____
Telephone Number

_____
Contact Person

Exhibit G:

Vicinity Map

Marshall Municipal Utilities
Miami 1 Substation



STATE OF MISSOURI
MELANIE JANE PARKER
NUMBER PE-2018000256
PROFESSIONAL ENGINEER

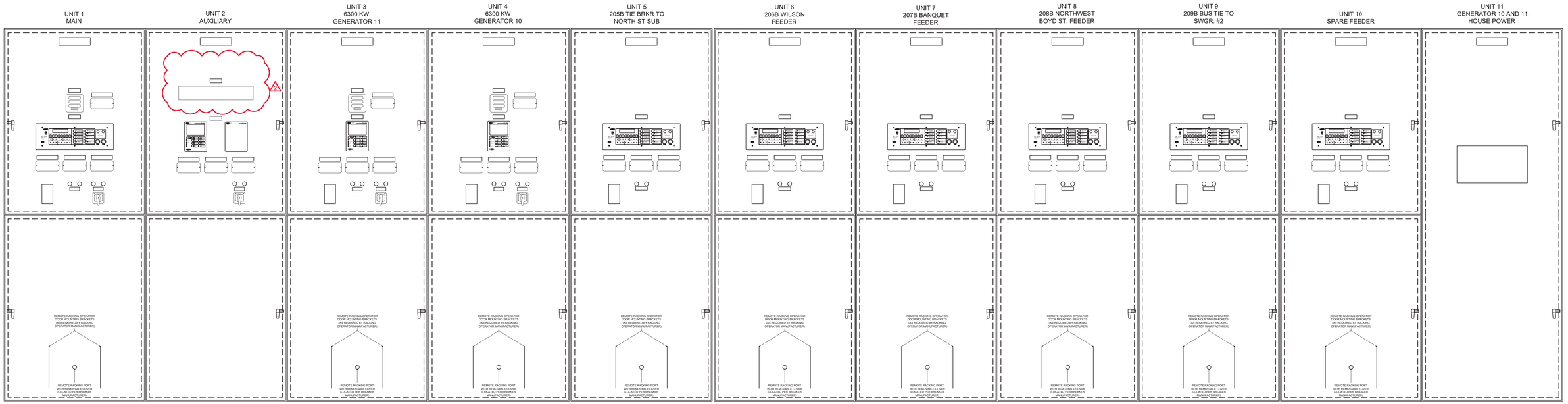
Melanie Jane Parker
2024.01.15 15:56:09-06'00'
MELANIE JANE PARKER - ENGINEER
MO# PE-2018000256

DATE	REVISION	#
12/19/2023	ISSUED FOR BID	0
01/03/2024	REVISED FOR BID	1
01/15/2024	REVISED FOR BID	2

TOTH & ASSOCIATES
1550 E. REPUBLIC ROAD
SPRINGFIELD, MO 65804
Ph: 417-888-0645 Fax: 417-888-0657
www.tothassociates.com
CERTIFICATE OF AUTHORITY:
MO# E-2004004242-D

DWN. BY: SJT
CKD. BY: NTM
APPD. BY: MJP
DATE: 11/17/2023
SCALE: NONE
Graphic scale may change due to drawing reproduction

PROJECT: MIAMI SUBSTATION
LOCATION: 310 N MIAMI AVE, MARSHALL MO 65340
CLIENT: MARSHALL MUNICIPAL UTILITIES
MARSHALL, MO
TITLE: SWITCHGEAR NO. 1 RELAY ONE LINE
SHT NO: ER-101



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MELANIE JANE PARKER - ENGINEER
MO# PE-2018000256

DATE	REVISION	#
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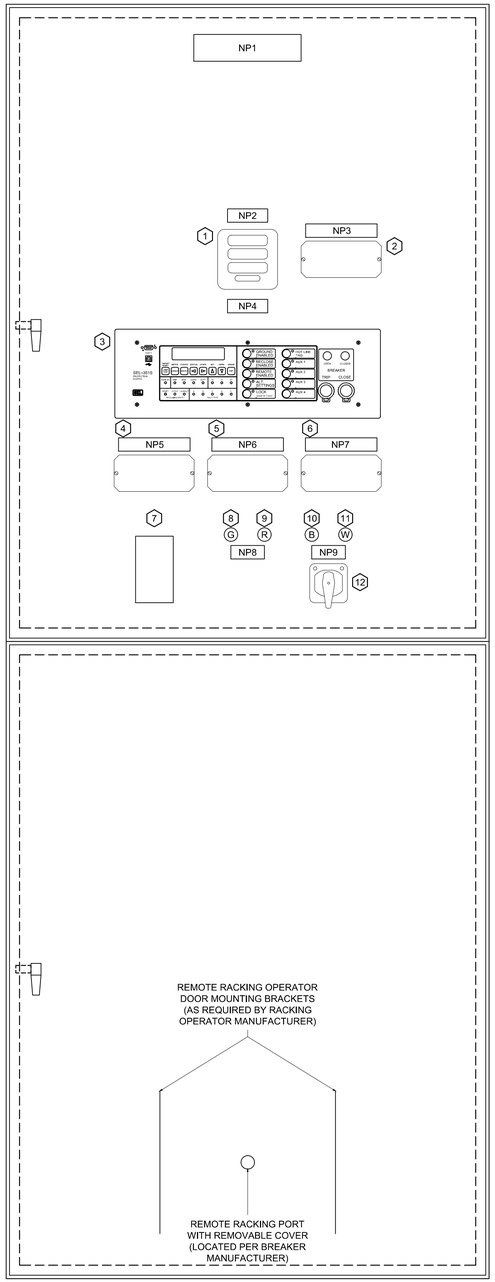
DWN. BY: SJT
CKD. BY: NTM
APPD. BY: MJP
DATE: 11/21/2023
SCALE: NONE
Graphic scale may change due to drawing reproduction

PROJECT: MIAMI SUBSTATION
LOCATION: 310 N MIAMI AVE, MARSHALL MO 65340
CLIENT: MARSHALL MUNICIPAL UTILITIES
MARSHALL, MO
TITLE: SWITCHGEAR NO. 1 ELEVATIONS
SHT NO: ER-300



UNIT 1
NAMEPLATE LEGEND

NAMEPLATE	NAMEPLATE TEXT
NP1	UNIT #1 BREAKER 1 T1 MAIN BREAKER
NP2	VOLTMETER
NP3	TS1 VOLTMETER VA | VB | VC | VN
NP4	SEL-351S OVERCURRENT RELAY
NP5	TS1 SEL-351S VA | VB | VC | VN | IA | IA+ | IB | IB+ | IC | IC+
NP6	TS2 SEL-351S VS | NS | IN 101
NP7	TS3 SEL-351S OUT 101 | OUT 102 | OUT 103 | OUT 104 | ALARM
NP8	BREAKER 1 STATUS
NP9	86BB BUS BACKUP

UNIT 1

BILL OF MATERIAL

ITEM NO.	QTY	DESCRIPTION	MANUFACTURER	CATALOG NUMBER
1	1	3-PHASE PANEL METER WITH MIN/MAX, ONE DISPLAY 3-LINE ALPHANUMERIC, VOLTS WITH MIN/MAX, 48-250VDC / 69-240VAC POWER SUPPLY, 120VAC INPUT, 1 - RS-232/485 SOFTWARE-SELECTABLE COMM PORT	BITRONICS	M350-V3-U-0-1-0
2	1	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 119, P P P P C-C C-C C-C	ABB	C670B197G18
3	1	STANDARD FIRMWARE, 3U HORIZONTAL PANEL MOUNT, NO CONFORMAL COATING, STANDARD USER INTERFACE WITH USB, INDOOR PUSHBUTTONS WITH CONFIGURABLE LABELS, 48/125VDC / 120VAC POWER SUPPLY, TWO 10/100 BASE-T WITH EIA-485 COMMUNICATIONS INTERFACE, STANDARD COMMUNICATIONS PROTOCOLS, 5A PHASE 5A NEUTRAL SECONDARY INPUT CURRENT, 125VDC CONTROL INPUT VOLTAGE, NO ADDITIONAL I/O BOARD	SEL	351S#91AM
4	1	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 119, P P P P C-C C-C C-C	ABB	C670B197G18
5, 6	2	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 001, P P P P P P P P P P	ABB	C129A501G01
7	1	GFCI DUPLEX RECEPTACLE		
8	1	LED INDICATING LIGHT, ET-16, 125VDC, GREEN LED LAMP, GREEN TRANSPARENT CAP	GE	116B6708G4-3-G73-G4
9	1	LED INDICATING LIGHT, ET-16, 125VDC, RED LED LAMP, RED TRANSPARENT CAP	GE	116B6708G4-3-R73-R4
10	1	LED INDICATING LIGHT, ET-16, 125VDC, BLUE LED LAMP, BLUE TRANSPARENT CAP	GE	116B6708G4-3-B73-B4
11	1	LED INDICATING LIGHT, ET-16, 125VDC, WHITE LED LAMP, WHITE TRANSPARENT CAP	GE	116B6708G4-3-W73-W5
12	1	SERIES 24 LOR, 8 DECKS, 125VDC TRIP COIL	ELECTROSWITCH	7808D

NOTES:
1. NAMEPLATES SHALL BE CENTERED ABOVE CORRESPONDING EQUIPMENT.
2. TEST SWITCH LABELS SHALL HAVE POLE IDENTIFIERS CENTERED ABOVE EACH POLE.

STATE OF MISSOURI
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MO# PE-2018000256

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DWN. BY: SJT
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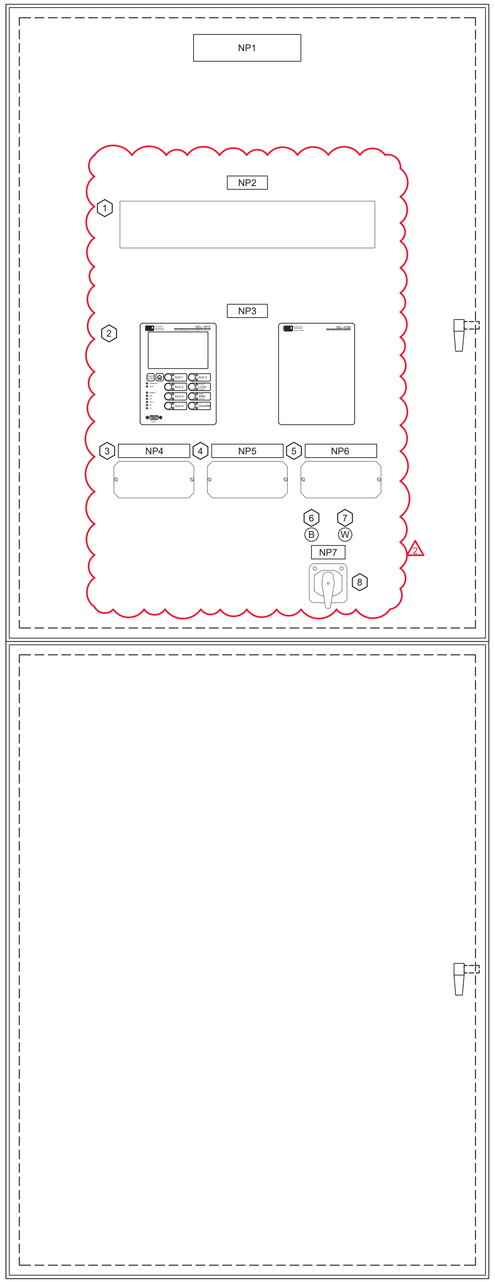
APPD. BY: MJP
DATE: 11/21/2023
SCALE: NONE
Graphic scale may change due to drawing reproduction

PROJECT: MIAMI SUBSTATION
LOCATION: 310 N MIAMI AVE, MARSHALL MO 65340
CLIENT: MARSHALL MUNICIPAL UTILITIES
MARSHALL, MO
TITLE: SWITCHGEAR NO. 1 UNIT 1 BREAKER 1 EQUIPMENT LAYOUT
SHT NO: ER-301



UNIT 2
NAMEPLATE LEGEND

NAMEPLATE	NAMEPLATE TEXT
NP1	UNIT #2 AUXILIARY
NP2	ETHERNET SWITCH
NP3	87B SWGR BUS 1 DIFFERENTIAL RELAY
NP4	TS1 87B VA | VB | VC | VN | IA | IA+ | IB | IB+ | IC | IC+
NP5	TS2 87B OUT1 | OUT2 | OUT3 | OUT4 | ALARM | | | ALARM
NP6	TS3 87B IN 101 | IN 102 | IN 103 | IN 104
NP7	86BP BUS

1

UNIT 2

BILL OF MATERIAL

ITEM NO.	QTY	DESCRIPTION	MANUFACTURER	CATALOG NUMBER
1	1	BLANK PLATE FOR OWNER FURNISHED ETHERNET SWITCH		
2	1	110-250VDC POWER SUPPLY, 125VDC DIGITAL INPUT VOLTAGE, COLOR TOUCHSCREEN WITH 8 PUSHBUTTONS, SINGLE 10/100BASE-T ETHERNET PORT, EIA-232 REAR SERIAL PORT, DNP3 PROTOCOL, ETHERNET/IP PROTOCOL, SLOT C: 4 DI / 4 DO ELECTROMECHANICAL 125VDC INPUT VOLTAGE, SLOT D: 4 DI / 4 DO ELECTROMECHANICAL 125VDC, SLOT E: EMPTY, SLOT Z: 3-PHASE AC VOLTAGE, 5A PHASE, 5A NEUTRAL, SEL-HZM HIGH-IMPEDANCE MODULE WITH 2KOHM RESISTOR, PANEL MOUNT	SEL	787Z#G46F
3	1	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 119, P P P P C-C C-C C-C	ABB	C670B197G18
4, 5	2	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 001, P P P P P P P P P P	ABB	C129A501G01
6	1	LED INDICATING LIGHT, ET-16, 125VDC, BLUE LED LAMP, BLUE TRANSPARENT CAP	GE	116B6708G4-3-B73-B4
7	1	LED INDICATING LIGHT, ET-16, 125VDC, WHITE LED LAMP, WHITE TRANSPARENT CAP	GE	116B6708G4-3-W73-W5
8	1	SERIES 24 LOR, 8 DECKS, 125VDC TRIP COIL	ELECTROSWITCH	7808D

2

NOTES:
1. NAMEPLATES SHALL BE CENTERED ABOVE CORRESPONDING EQUIPMENT.
2. TEST SWITCH LABELS SHALL HAVE POLE IDENTIFIERS CENTERED ABOVE EACH POLE.

STATE OF MISSOURI
MELANIE JANE PARKER
NUMBER PE-2018000256
PROFESSIONAL ENGINEER

Melanie Jane Parker
2024.01.15 15:05:23-06'00'
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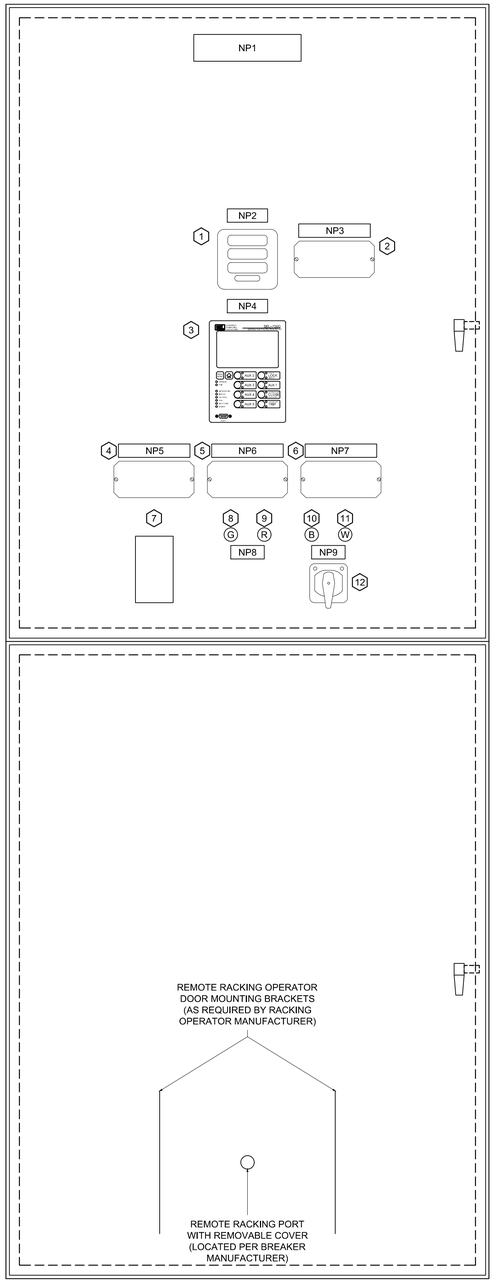
DATE: 11/21/2023
SCALE: NONE
Graphic scale may change due to drawing reproduction

PROJECT: MIAMI SUBSTATION
LOCATION: 310 N MIAMI AVE, MARSHALL MO 65340
CLIENT: MARSHALL MUNICIPAL UTILITIES
MARSHALL, MO
TITLE: SWITCHGEAR NO. 1 UNIT 2 AUXILIARY EQUIPMENT LAYOUT
SHT NO: ER-302



UNIT 3
NAMEPLATE LEGEND

NAMEPLATE	NAMEPLATE TEXT
NP1	UNIT #3 BREAKER 3 GENERATOR 11
NP2	METER
NP3	TS1 METER VA | VB | VC | VN | IA | IA+ | IB | IB+ | IC | IC+
NP4	SEL-700G GENERATOR 11 PROTECTION
NP5	TS2 SEL-700G VAX | VBX | VCX | VNX | IAY | IAY+ | IBY | IBY+ | ICY | ICY+
NP6	TS3 SEL-700G VN | NN | IN | IN+ | IAX | IAX+ | IBX | IBX+ | ICX | ICX+
NP7	TS4 SEL-700G VS | NS | OUT 101 | OUT 102 | OUT 103 | IN 101 | IN 102 | IN 103 | ALARM
NP8	BREAKER 3 STATUS
NP9	86G LOCKOUT RELAY

UNIT 3

BILL OF MATERIAL

ITEM NO.	QTY	DESCRIPTION	MANUFACTURER	CATALOG NUMBER
1	1	MULTIFUNCTION 3-PHASE SCADA MEASUREMENTS WITH COMPREHENSIVE MEASUREMENT SUITE, ONE DISPLAY 3-LINE ALPHANUMERIC, AMPS, VOLTS, WATTS, VARS, FUNDAMENTAL FREQUENCY AND OTHERS, 38-250VDC / 69-240VAC POWER SUPPLY, 120VAC 0-5AMP INPUT, 1 - RS-232/485 SOFTWARE-SELECTABLE COMM PORT	BITRONICS	M650-B3-U-5-1-0
2	1	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 119, P P P P C-C C-C C-C	ABB	C670B197G18
3	1	700G1+, BASIC GENERATOR PROTECTION PLUS 87, GEN 25, 64G, 21, 78, 78VS, AUTO SYNCHRONIZER, COLOR TOUCHSCREEN WITH 8 PUSHBUTTONS, 110-250VDC POWER SUPPLY, 125VDC DIGITAL INPUT VOLTAGE, SINGLE 10/100BASE-T ETHERNET PORT, EIA-232 REAR PORT, IEC 61850 PROTOCOL, DNP3 PROTOCOL, ETHERNET/IP PROTOCOL, SLOT C: 4 DI / 4 DO ELECTROMECHANICAL 125VDC, SLOT D: 4 DI / 4 DO ELECTROMECHANICAL 125VDC, SLOT E: 3-PHASE 5 AMP AC CURRENT INPUT / VSYNC INPUT AND VN INPUT, SLOT Z: 3-PHASE 5 AMP AC CURRENT INPUT / 5 AMP NEUTRAL AC CURRENT INPUT / 3-PHASE AC VOLTAGE	SEL	700G#NJMT
4	1	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 119, P P P P C-C C-C C-C	ABB	C670B197G18
5	1	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 184, P P C-C C-C C-C C-C	ABB	C716B562G25
6	1	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 001, P P P P P P P P P P	ABB	C129A501G01
7	1	GFCI DUPLEX RECEPTACLE		
8	1	LED INDICATING LIGHT, ET-16, 125VDC, GREEN LED LAMP, GREEN TRANSPARENT CAP	GE	116B6708G4-3-G73-G4
9	1	LED INDICATING LIGHT, ET-16, 125VDC, RED LED LAMP, RED TRANSPARENT CAP	GE	116B6708G4-3-R73-R4
10	1	LED INDICATING LIGHT, ET-16, 125VDC, BLUE LED LAMP, BLUE TRANSPARENT CAP	GE	116B6708G4-3-B73-B4
11	1	LED INDICATING LIGHT, ET-16, 125VDC, WHITE LED LAMP, WHITE TRANSPARENT CAP	GE	116B6708G4-3-W73-W5
12	1	SERIES 24 LOR, 6 DECKS, 125VDC TRIP COIL	ELECTROSWITCH	7806D

NOTES:
1. NAMEPLATES SHALL BE CENTERED ABOVE CORRESPONDING EQUIPMENT.
2. TEST SWITCH LABELS SHALL HAVE POLE IDENTIFIERS CENTERED ABOVE EACH POLE.

STATE OF MISSOURI
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DWN. BY: SJT
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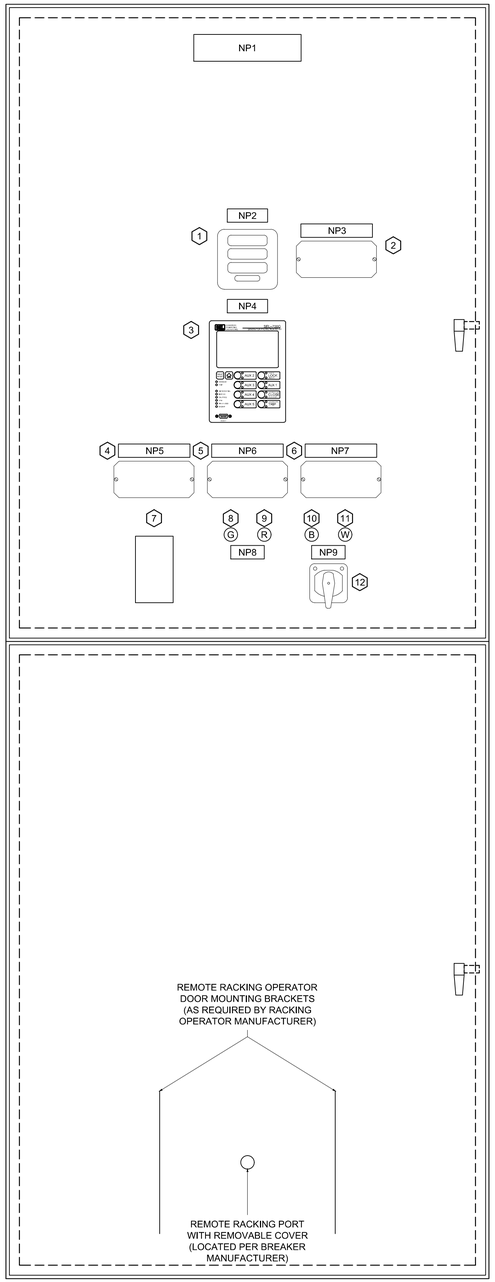
DATE: 11/21/2023
SCALE: NONE
Graphic scale may change due to drawing reproduction

PROJECT: MIAMI SUBSTATION
LOCATION: 310 N MIAMI AVE, MARSHALL MO 65340
CLIENT: MARSHALL MUNICIPAL UTILITIES
MARSHALL, MO

TITLE: SWITCHGEAR NO. 1 UNIT 3 BREAKER 3 EQUIPMENT LAYOUT
SHT NO: ER-303



UNIT 4
NAMEPLATE LEGEND

NAMEPLATE	NAMEPLATE TEXT
NP1	UNIT #4 BREAKER 4 GENERATOR 10
NP2	METER
NP3	TS1 METER VA | VB | VC | VN | IA | IA+ | IB | IB+ | IC | IC+
NP4	SEL-700G GENERATOR 10 PROTECTION
NP5	TS2 SEL-700G VAX | VBX | VCX | VNX | IAY | IAY+ | IBY | IBY+ | ICY | ICY+
NP6	TS3 SEL-700G VN | NN | IN | IN+ | IAX | IAX+ | IBX | IBX+ | ICX | ICX+
NP7	TS4 SEL-700G VS | NS | OUT 101 | OUT 102 | OUT 103 | IN 101 | IN 102 | IN 103 | ALARM
NP8	BREAKER 4 STATUS
NP9	86G LOCKOUT RELAY

UNIT 4

BILL OF MATERIAL

ITEM NO.	QTY	DESCRIPTION	MANUFACTURER	CATALOG NUMBER
1	1	MULTIFUNCTION 3-PHASE SCADA MEASUREMENTS WITH COMPREHENSIVE MEASUREMENT SUITE, ONE DISPLAY 3-LINE ALPHANUMERIC, AMPS, VOLTS, WATTS, VARS, FUNDAMENTAL FREQUENCY AND OTHERS, 38-250VDC / 69-240VAC POWER SUPPLY, 120VAC 0-5AMP INPUT, 1 - RS-232/485 SOFTWARE-SELECTABLE COMM PORT	BITRONICS	M650-B3-U-5-1-0
2	1	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 119, P P P P C-C C-C C-C	ABB	C670B197G18
3	1	700G1+, BASIC GENERATOR PROTECTION PLUS 87, GEN 25, 64G, 21, 78, 78VS, AUTO SYNCHRONIZER, COLOR TOUCHSCREEN WITH 8 PUSHBUTTONS, 110-250VDC POWER SUPPLY, 125VDC DIGITAL INPUT VOLTAGE, SINGLE 10/100BASE-T ETHERNET PORT, EIA-232 REAR PORT, IEC 61850 PROTOCOL, DNP3 PROTOCOL, ETHERNET/IP PROTOCOL, SLOT C: 4 DI / 4 DO ELECTROMECHANICAL 125VDC, SLOT D: 4 DI / 4 DO ELECTROMECHANICAL 125VDC, SLOT E: 3-PHASE 5 AMP AC CURRENT INPUT / VSYNC INPUT AND VN INPUT, SLOT Z: 3-PHASE 5 AMP AC CURRENT INPUT / 5 AMP NEUTRAL AC CURRENT INPUT / 3-PHASE AC VOLTAGE	SEL	700G#NJMT
4	1	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 119, P P P P C-C C-C C-C	ABB	C670B197G18
5	1	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 184, P P C-C C-C C-C C-C C-C	ABB	C716B562G25
6	1	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 001, P P P P P P P P P P	ABB	C129A501G01
7	1	GFCI DUPLEX RECEPTACLE		
8	1	LED INDICATING LIGHT, ET-16, 125VDC, GREEN LED LAMP, GREEN TRANSPARENT CAP	GE	116B6708G4-3-G73-G4
9	1	LED INDICATING LIGHT, ET-16, 125VDC, RED LED LAMP, RED TRANSPARENT CAP	GE	116B6708G4-3-R73-R4
10	1	LED INDICATING LIGHT, ET-16, 125VDC, BLUE LED LAMP, BLUE TRANSPARENT CAP	GE	116B6708G4-3-B73-B4
11	1	LED INDICATING LIGHT, ET-16, 125VDC, WHITE LED LAMP, WHITE TRANSPARENT CAP	GE	116B6708G4-3-W73-W5
12	1	SERIES 24 LOR, 6 DECKS, 125VDC TRIP COIL	ELECTROSWITCH	7806D

NOTES:
1. NAMEPLATES SHALL BE CENTERED ABOVE CORRESPONDING EQUIPMENT.
2. TEST SWITCH LABELS SHALL HAVE POLE IDENTIFIERS CENTERED ABOVE EACH POLE.

STATE OF MISSOURI
MELANIE JANE PARKER
NUMBER PE-2018000256
PROFESSIONAL ENGINEER

Melanie Jane Parker
2024.01.03 15:10:06-06'00'
MELANIE JANE PARKER - ENGINEER
MO# PE-2018000256

DATE	REVISION	#
12/19/2023	ISSUED FOR BID	0
01/03/2024	REVISED FOR BID	1

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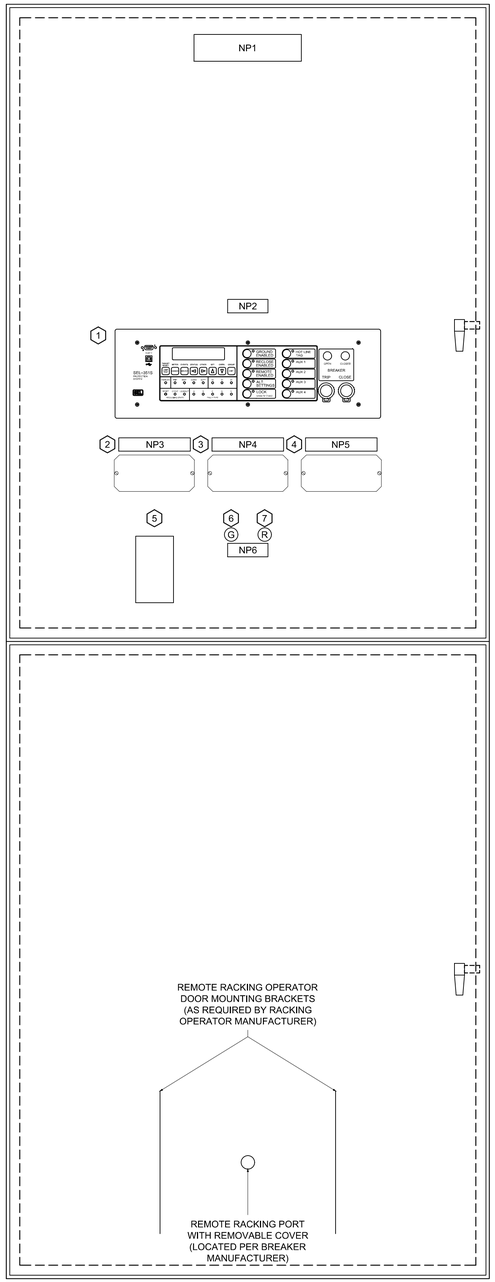
Ph: 417-888-0645 Fax: 417-888-0657
www.tothassociates.com
CERTIFICATE OF AUTHORITY:
MO# E-2004004242-D

DWN. BY: SJT
CKD. BY: NTM
APPD. BY: MJP
DATE: 11/21/2023
SCALE: NONE
Graphic scale may change due to drawing reproduction

PROJECT: MIAMI SUBSTATION
LOCATION: 310 N MIAMI AVE, MARSHALL MO 65340
CLIENT: MARSHALL MUNICIPAL UTILITIES
MARSHALL, MO

TITLE: SWITCHGEAR NO. 1 UNIT 4 BREAKER 4 EQUIPMENT LAYOUT
SHT NO: ER-304



UNIT 5
NAMEPLATE LEGEND

NAMEPLATE	NAMEPLATE TEXT
NP1	UNIT #5 BREAKER 5 205B TIE NORTH ST. SUB
NP2	SEL-351S OVERCURRENT RELAY
NP3	TS1 SEL-351S VA | VB | VC | VN | IA | IA+ | IB | IB+ | IC | IC+
NP4	TS2 SEL-351S VS | NS | IN 101
NP5	TS3 SEL-351S OUT 101 | OUT 102 | OUT 103 | OUT 104 | ALARM
NP6	BREAKER 5 STATUS

UNIT 5

BILL OF MATERIAL

ITEM NO.	QTY	DESCRIPTION	MANUFACTURER	CATALOG NUMBER
1	1	STANDARD FIRMWARE, 3U HORIZONTAL PANEL MOUNT, NO CONFORMAL COATING, STANDARD USER INTERFACE WITH USB, INDOOR PUSHBUTTONS WITH CONFIGURABLE LABELS, 48/125VDC / 120VAC POWER SUPPLY, TWO 10/100 BASE-T WITH EIA-485 COMMUNICATIONS INTERFACE, STANDARD COMMUNICATIONS PROTOCOLS, 5A PHASE 5A NEUTRAL SECONDARY INPUT CURRENT, 125VDC CONTROL INPUT VOLTAGE, NO ADDITIONAL I/O BOARD	SEL	351S#91AM
2	1	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 119, P P P P C-C C-C C-C	ABB	C670B197G18
3, 4	2	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 001, P P P P P P P P P P	ABB	C129A501G01
5	1	GFCI DUPLEX RECEPTACLE		
6	1	LED INDICATING LIGHT, ET-16, 125VDC, GREEN LED LAMP, GREEN TRANSPARENT CAP	GE	116B6708G4-3-G73-G4
7	1	LED INDICATING LIGHT, ET-16, 125VDC, RED LED LAMP, RED TRANSPARENT CAP	GE	116B6708G4-3-R73-R4

NOTES:
1. NAMEPLATES SHALL BE CENTERED ABOVE CORRESPONDING EQUIPMENT.
2. TEST SWITCH LABELS SHALL HAVE POLE IDENTIFIERS CENTERED ABOVE EACH POLE.

STATE OF MISSOURI
MELANIE JANE PARKER
NUMBER PE-2018000256
PROFESSIONAL ENGINEER

Melanie Jane Parker
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MO# PE-2018000256

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01/03/2024	REVISED FOR BID	1

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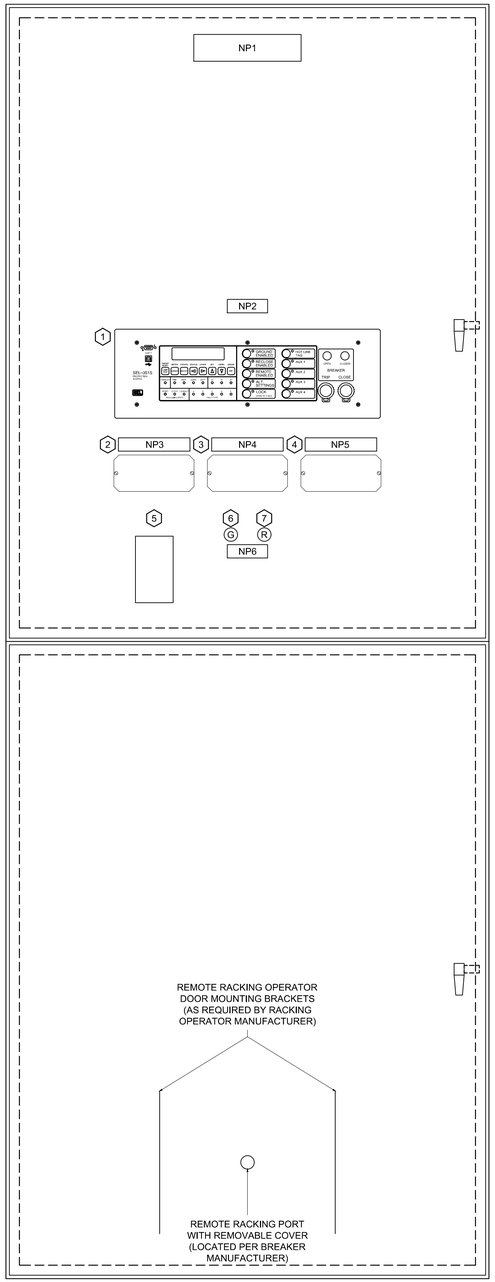
CERTIFICATE OF AUTHORITY:
MO# E-2004004242-D

DWN. BY: SJT
CKD. BY: NTM
APPD. BY: MJP
DATE: 11/21/2023
SCALE: NONE
Graphic scale may change due to drawing reproduction

PROJECT: MIAMI SUBSTATION
LOCATION: 310 N MIAMI AVE, MARSHALL MO 65340
CLIENT: MARSHALL MUNICIPAL UTILITIES
MARSHALL, MO
TITLE: SWITCHGEAR NO. 1 UNIT 5 BREAKER 5 EQUIPMENT LAYOUT
SHT NO: ER-305



UNIT 6
NAMEPLATE LEGEND

NAMEPLATE	NAMEPLATE TEXT
NP1	UNIT #6 BREAKER 6 206B WILSON FEEDER
NP2	SEL-351S OVERCURRENT RELAY
NP3	TS1 SEL-351S VA | VB | VC | VN | IA | IA+ | IB | IB+ | IC | IC+
NP4	TS2 SEL-351S VS | NS | IN 101
NP5	TS3 SEL-351S OUT 101 | OUT 102 | OUT 103 | OUT 104 | ALARM
NP6	BREAKER 6 STATUS

UNIT 6

BILL OF MATERIAL

ITEM NO.	QTY	DESCRIPTION	MANUFACTURER	CATALOG NUMBER
1	1	STANDARD FIRMWARE, 3U HORIZONTAL PANEL MOUNT, NO CONFORMAL COATING, STANDARD USER INTERFACE WITH USB, INDOOR PUSHBUTTONS WITH CONFIGURABLE LABELS, 48/125VDC / 120VAC POWER SUPPLY, TWO 10/100 BASE-T WITH EIA-485 COMMUNICATIONS INTERFACE, STANDARD COMMUNICATIONS PROTOCOLS, 5A PHASE 5A NEUTRAL SECONDARY INPUT CURRENT, 125VDC CONTROL INPUT VOLTAGE, NO ADDITIONAL I/O BOARD	SEL	351S#91AM
2	1	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 119, P P P P C-C C-C C-C	ABB	C670B197G18
3, 4	2	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 001, P P P P P P P P P P	ABB	C129A501G01
5	1	GFCI DUPLEX RECEPTACLE		
6	1	LED INDICATING LIGHT, ET-16, 125VDC, GREEN LED LAMP, GREEN TRANSPARENT CAP	GE	116B6708G4-3-G73-G4
7	1	LED INDICATING LIGHT, ET-16, 125VDC, RED LED LAMP, RED TRANSPARENT CAP	GE	116B6708G4-3-R73-R4

NOTES:
1. NAMEPLATES SHALL BE CENTERED ABOVE CORRESPONDING EQUIPMENT.
2. TEST SWITCH LABELS SHALL HAVE POLE IDENTIFIERS CENTERED ABOVE EACH POLE.

STATE OF MISSOURI
MELANIE JANE PARKER
NUMBER PE-2018000256
PROFESSIONAL ENGINEER

Melanie Jane Parker
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MELANIE JANE PARKER - ENGINEER
MO# PE-2018000256

DATE	REVISION	#
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01/03/2024	REVISED FOR BID	1

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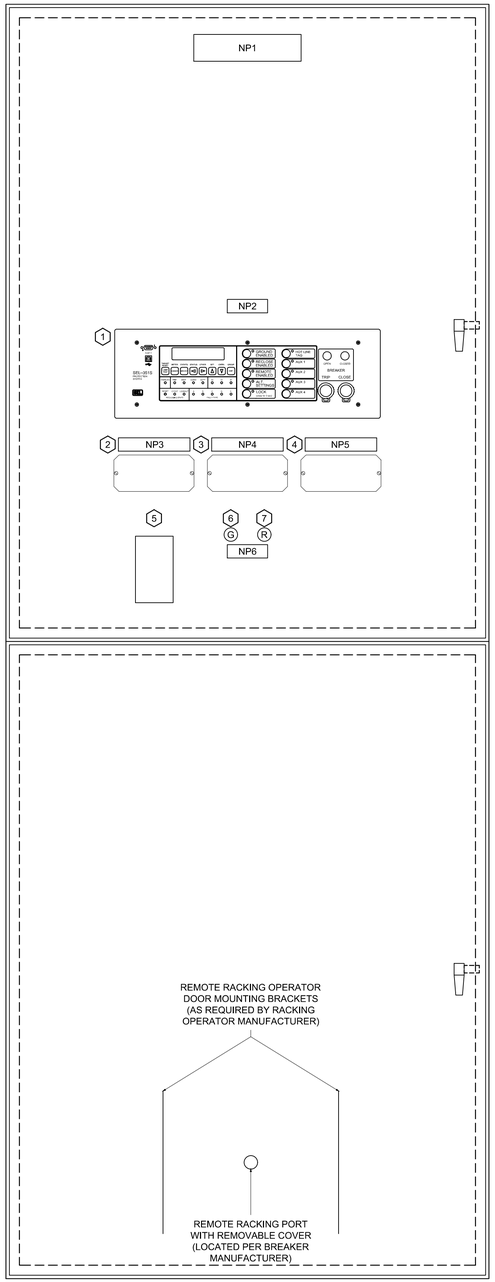
CERTIFICATE OF AUTHORITY:
MO# E-2004004242-D

DWN. BY: SJT
CKD. BY: NTM
APPD. BY: MJP
DATE: 11/21/2023
SCALE: NONE
Graphic scale may change due to drawing reproduction

PROJECT: MIAMI SUBSTATION
LOCATION: 310 N MIAMI AVE, MARSHALL MO 65340
CLIENT: MARSHALL MUNICIPAL UTILITIES
MARSHALL, MO
TITLE: SWITCHGEAR NO. 1 UNIT 6 BREAKER 6 EQUIPMENT LAYOUT
SHT NO: ER-306



UNIT 7
NAMEPLATE LEGEND

NAMEPLATE	NAMEPLATE TEXT
NP1	UNIT #7 BREAKER 7 207B BANQUET FEEDER
NP2	SEL-351S OVERCURRENT RELAY
NP3	TS1 SEL-351S VA | VB | VC | VN | IA | IA+ | IB | IB+ | IC | IC+
NP4	TS2 SEL-351S VS | NS | IN 101
NP5	TS3 SEL-351S OUT 101 | OUT 102 | OUT 103 | OUT 104 | ALARM
NP6	BREAKER 7 STATUS

UNIT 7

BILL OF MATERIAL

ITEM NO.	QTY	DESCRIPTION	MANUFACTURER	CATALOG NUMBER
1	1	STANDARD FIRMWARE, 3U HORIZONTAL PANEL MOUNT, NO CONFORMAL COATING, STANDARD USER INTERFACE WITH USB, INDOOR PUSHBUTTONS WITH CONFIGURABLE LABELS, 48/125VDC / 120VAC POWER SUPPLY, TWO 10/100 BASE-T WITH EIA-485 COMMUNICATIONS INTERFACE, STANDARD COMMUNICATIONS PROTOCOLS, 5A PHASE 5A NEUTRAL SECONDARY INPUT CURRENT, 125VDC CONTROL INPUT VOLTAGE, NO ADDITIONAL I/O BOARD	SEL	351S#91AM
2	1	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 119, P P P P C-C C-C C-C	ABB	C670B197G18
3, 4	2	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 001, P P P P P P P P P P	ABB	C129A501G01
5	1	GFCI DUPLEX RECEPTACLE		
6	1	LED INDICATING LIGHT, ET-16, 125VDC, GREEN LED LAMP, GREEN TRANSPARENT CAP	GE	116B6708G4-3-G73-G4
7	1	LED INDICATING LIGHT, ET-16, 125VDC, RED LED LAMP, RED TRANSPARENT CAP	GE	116B6708G4-3-R73-R4

NOTES:
1. NAMEPLATES SHALL BE CENTERED ABOVE CORRESPONDING EQUIPMENT.
2. TEST SWITCH LABELS SHALL HAVE POLE IDENTIFIERS CENTERED ABOVE EACH POLE.

STATE OF MISSOURI
MELANIE JANE PARKER
NUMBER PE-2018000256
PROFESSIONAL ENGINEER

Melanie Jane Parker
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MELANIE JANE PARKER - ENGINEER
MO# PE-2018000256

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01/03/2024	REVISED FOR BID	1

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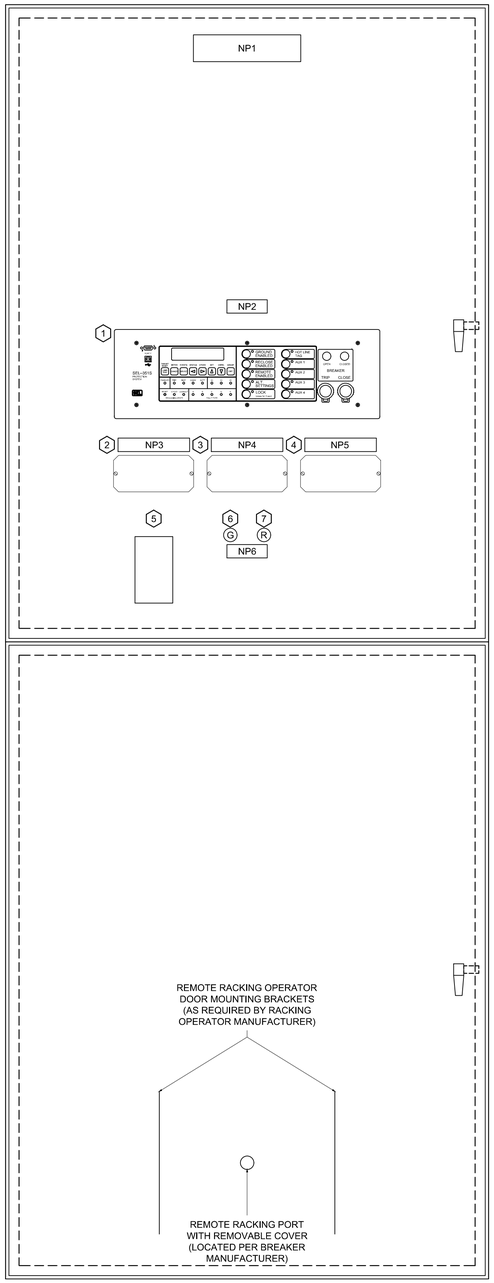
www.tothassociates.com
CERTIFICATE OF AUTHORITY:
MO# E-2004004242-D

DWN. BY: SJT
CKD. BY: NTM
APPD. BY: MJP
DATE: 11/21/2023
SCALE: NONE
Graphic scale may change due to drawing reproduction

PROJECT: MIAMI SUBSTATION
LOCATION: 310 N MIAMI AVE, MARSHALL MO 65340
CLIENT: MARSHALL MUNICIPAL UTILITIES
MARSHALL, MO

TITLE: SWITCHGEAR NO. 1 UNIT 7 BREAKER 7
EQUIPMENT LAYOUT

SHT NO: ER-307



UNIT 8
NAMEPLATE LEGEND

NAMEPLATE	NAMEPLATE TEXT
NP1	UNIT #8 BREAKER 8 208B NORTHWEST BOYD ST, FEEDER
NP2	SEL-351S OVERCURRENT RELAY
NP3	TS1 SEL-351S VA | VB | VC | VN | IA | IA+ | IB | IB+ | IC | IC+
NP4	TS2 SEL-351S VS | NS | IN 101
NP5	TS3 SEL-351S OUT 101 | OUT 102 | OUT 103 | OUT 104 | ALARM
NP6	BREAKER 8 STATUS

UNIT 8

BILL OF MATERIAL

ITEM NO.	QTY	DESCRIPTION	MANUFACTURER	CATALOG NUMBER
1	1	STANDARD FIRMWARE, 3U HORIZONTAL PANEL MOUNT, NO CONFORMAL COATING, STANDARD USER INTERFACE WITH USB, INDOOR PUSHBUTTONS WITH CONFIGURABLE LABELS, 48/125VDC / 120VAC POWER SUPPLY, TWO 10/100 BASE-T WITH EIA-485 COMMUNICATIONS INTERFACE, STANDARD COMMUNICATIONS PROTOCOLS, 5A PHASE 5A NEUTRAL SECONDARY INPUT CURRENT, 125VDC CONTROL INPUT VOLTAGE, NO ADDITIONAL I/O BOARD	SEL	351S#91AM
2	1	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 119, P P P P C-C C-C C-C	ABB	C670B197G18
3, 4	2	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 001, P P P P P P P P P P	ABB	C129A501G01
5	1	GFCI DUPLEX RECEPTACLE		
6	1	LED INDICATING LIGHT, ET-16, 125VDC, GREEN LED LAMP, GREEN TRANSPARENT CAP	GE	116B6708G4-3-G73-G4
7	1	LED INDICATING LIGHT, ET-16, 125VDC, RED LED LAMP, RED TRANSPARENT CAP	GE	116B6708G4-3-R73-R4

NOTES:
1. NAMEPLATES SHALL BE CENTERED ABOVE CORRESPONDING EQUIPMENT.
2. TEST SWITCH LABELS SHALL HAVE POLE IDENTIFIERS CENTERED ABOVE EACH POLE.

STATE OF MISSOURI
MELANIE JANE PARKER
NUMBER PE-2018000256
PROFESSIONAL ENGINEER

Melanie Jane Parker
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01/03/2024	REVISED FOR BID	1

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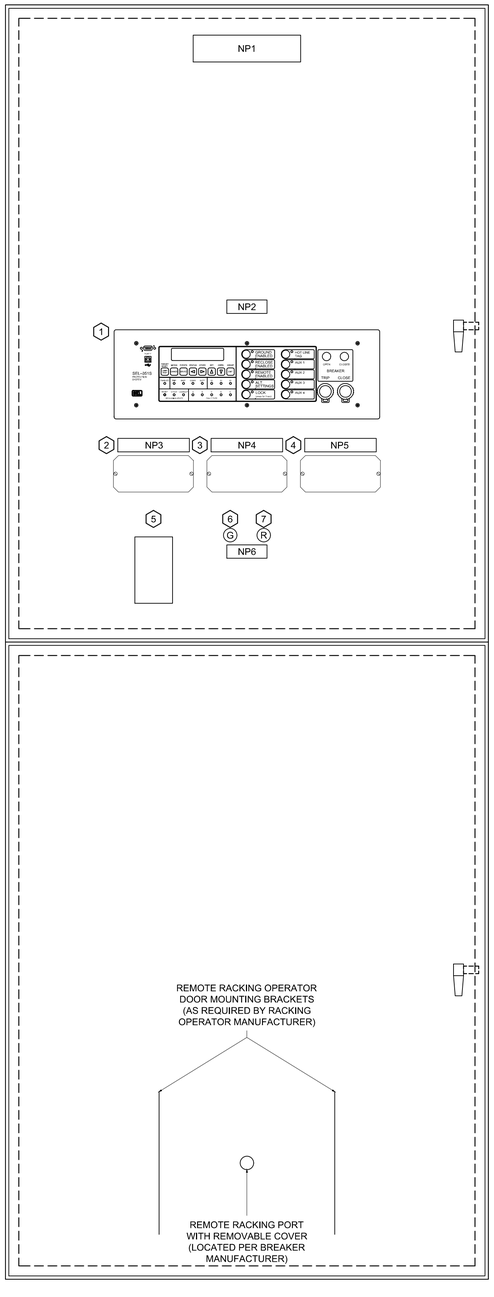
www.tothassociates.com
CERTIFICATE OF AUTHORITY:
MO# E-2004004242-D

DWN. BY: SJT
CKD. BY: NTM
APPD. BY: MJP
DATE: 11/21/2023
SCALE: NONE
Graphic scale may change due to drawing reproduction

PROJECT: MIAMI SUBSTATION
LOCATION: 310 N MIAMI AVE, MARSHALL MO 65340
CLIENT: MARSHALL MUNICIPAL UTILITIES
MARSHALL, MO
TITLE: SWITCHGEAR NO. 1 UNIT 8 BREAKER 8 EQUIPMENT LAYOUT
SHT NO: ER-308



UNIT 9
NAMEPLATE LEGEND

NAMEPLATE	NAMEPLATE TEXT
NP1	UNIT #9 BREAKER 9 209B BUS TIE TO SWGR #2
NP2	SEL-351S OVERCURRENT RELAY
NP3	TS1 SEL-351S VA | VB | VC | VN | IA | IA+ | IB | IB+ | IC | IC+
NP4	TS2 SEL-351S VS | NS | IN 101
NP5	TS3 SEL-351S OUT 101 | OUT 102 | OUT 103 | OUT 104 | ALARM
NP6	BREAKER 9 STATUS

UNIT 9

BILL OF MATERIAL

ITEM NO.	QTY	DESCRIPTION	MANUFACTURER	CATALOG NUMBER
1	1	STANDARD FIRMWARE, 3U HORIZONTAL PANEL MOUNT, NO CONFORMAL COATING, STANDARD USER INTERFACE WITH USB, INDOOR PUSHBUTTONS WITH CONFIGURABLE LABELS, 48/125VDC / 120VAC POWER SUPPLY, TWO 10/100 BASE-T WITH EIA-485 COMMUNICATIONS INTERFACE, STANDARD COMMUNICATIONS PROTOCOLS, 5A PHASE 5A NEUTRAL SECONDARY INPUT CURRENT, 125VDC CONTROL INPUT VOLTAGE, NO ADDITIONAL I/O BOARD	SEL	351S#91AM
2	1	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 119, P P P P C-C C-C C-C	ABB	C670B197G18
3, 4	2	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 001, P P P P P P P P P P	ABB	C129A501G01
5	1	GFCI DUPLEX RECEPTACLE		
6	1	LED INDICATING LIGHT, ET-16, 125VDC, GREEN LED LAMP, GREEN TRANSPARENT CAP	GE	116B6708G4-3-G73-G4
7	1	LED INDICATING LIGHT, ET-16, 125VDC, RED LED LAMP, RED TRANSPARENT CAP	GE	116B6708G4-3-R73-R4

NOTES:
1. NAMEPLATES SHALL BE CENTERED ABOVE CORRESPONDING EQUIPMENT.
2. TEST SWITCH LABELS SHALL HAVE POLE IDENTIFIERS CENTERED ABOVE EACH POLE.

STATE OF MISSOURI
MELANIE JANE PARKER
NUMBER PE-2018000256
PROFESSIONAL ENGINEER

Melanie Jane Parker
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01/03/2024	REVISED FOR BID	1

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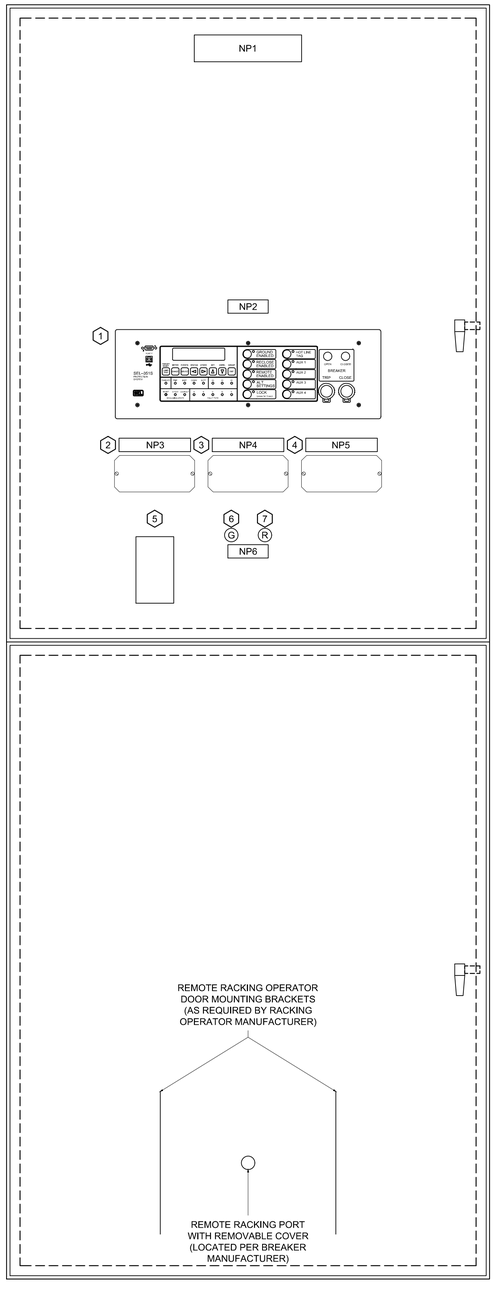
CERTIFICATE OF AUTHORITY:
MO# E-2004004242-D

DWN. BY: SJT
CKD. BY: NTM
APPD. BY: MJP
DATE: 11/21/2023
SCALE: NONE
Graphic scale may change due to drawing reproduction

PROJECT: MIAMI SUBSTATION
LOCATION: 310 N MIAMI AVE, MARSHALL MO 65340
CLIENT: MARSHALL MUNICIPAL UTILITIES
MARSHALL, MO
TITLE: SWITCHGEAR NO. 1 UNIT 9 BREAKER 9 EQUIPMENT LAYOUT
SHT NO: ER-309



UNIT 10
NAMEPLATE LEGEND

NAMEPLATE	NAMEPLATE TEXT
NP1	UNIT #10 BREAKER 10 210B SPARE FEEDER
NP2	SEL-351S OVERCURRENT RELAY
NP3	TS1 SEL-351S VA | VB | VC | VN | IA | IA+ | IB | IB+ | IC | IC+
NP4	TS2 SEL-351S VS | NS | IN 101
NP5	TS3 SEL-351S OUT 101 | OUT 102 | OUT 103 | OUT 104 | ALARM
NP6	BREAKER 10 STATUS

UNIT 10

BILL OF MATERIAL

ITEM NO.	QTY	DESCRIPTION	MANUFACTURER	CATALOG NUMBER
1	1	STANDARD FIRMWARE, 3U HORIZONTAL PANEL MOUNT, NO CONFORMAL COATING, STANDARD USER INTERFACE WITH USB, INDOOR PUSHBUTTONS WITH CONFIGURABLE LABELS, 48/125VDC / 120VAC POWER SUPPLY, TWO 10/100 BASE-T WITH EIA-485 COMMUNICATIONS INTERFACE, STANDARD COMMUNICATIONS PROTOCOLS, 5A PHASE 5A NEUTRAL SECONDARY INPUT CURRENT, 125VDC CONTROL INPUT VOLTAGE, NO ADDITIONAL I/O BOARD	SEL	351S#91AM
2	1	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 119, P P P P C-C C-C C-C	ABB	C670B197G18
3, 4	2	FT-1 STAND ALONE 10 POLE FLEXITEST SWITCH, SCREW TERNIMALS, STANDARD DEPTH, CLEAR COVER, CODE 001, P P P P P P P P P P	ABB	C129A501G01
5	1	GFCI DUPLEX RECEPTACLE		
6	1	LED INDICATING LIGHT, ET-16, 125VDC, GREEN LED LAMP, GREEN TRANSPARENT CAP	GE	116B6708G4-3-G73-G4
7	1	LED INDICATING LIGHT, ET-16, 125VDC, RED LED LAMP, RED TRANSPARENT CAP	GE	116B6708G4-3-R73-R4

NOTES:
1. NAMEPLATES SHALL BE CENTERED ABOVE CORRESPONDING EQUIPMENT.
2. TEST SWITCH LABELS SHALL HAVE POLE IDENTIFIERS CENTERED ABOVE EACH POLE.

STATE OF MISSOURI
MELANIE JANE PARKER
NUMBER PE-2018000256
PROFESSIONAL ENGINEER

Melanie Jane Parker
2024.01.03 14:47:47-06'00'
MELANIE JANE PARKER - ENGINEER
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01/03/2024	REVISED FOR BID	1

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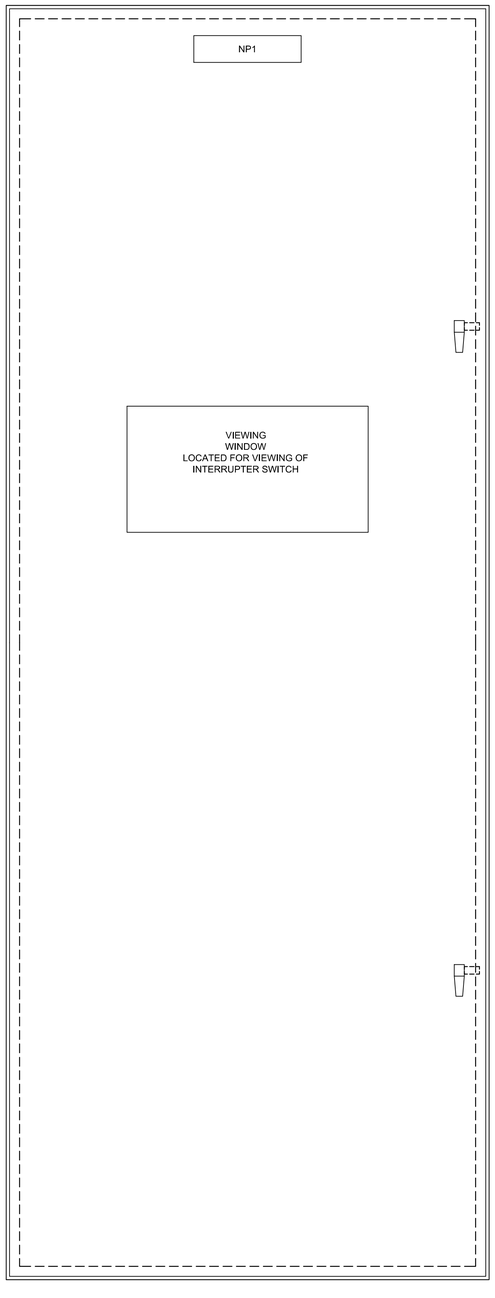
CERTIFICATE OF AUTHORITY:
MO# E-2004004242-D

DWN. BY: SJT
CKD. BY: NTM
APPD. BY: MJP
DATE: 11/21/2023
SCALE: NONE
Graphic scale may change due to drawing reproduction.

PROJECT: MIAMI SUBSTATION
LOCATION: 310 N MIAMI AVE, MARSHALL MO 65340
CLIENT: MARSHALL MUNICIPAL UTILITIES
MARSHALL, MO

TITLE: SWITCHGEAR NO. 1 UNIT 10 BREAKER 10 EQUIPMENT LAYOUT
SHT NO: ER-310



UNIT 11
NAMEPLATE LEGEND

NAMEPLATE	NAMEPLATE TEXT
NP1	GENERATOR 10 & 11 HOUSE POWER

NOTES:
1. NAMEPLATES SHALL BE CENTERED ABOVE CORRESPONDING EQUIPMENT.
2. TEST SWITCH LABELS SHALL HAVE POLE IDENTIFIERS CENTERED ABOVE EACH POLE.

STATE OF MISSOURI
MELANIE JANE PARKER
NUMBER PE-2018000256
PROFESSIONAL ENGINEER

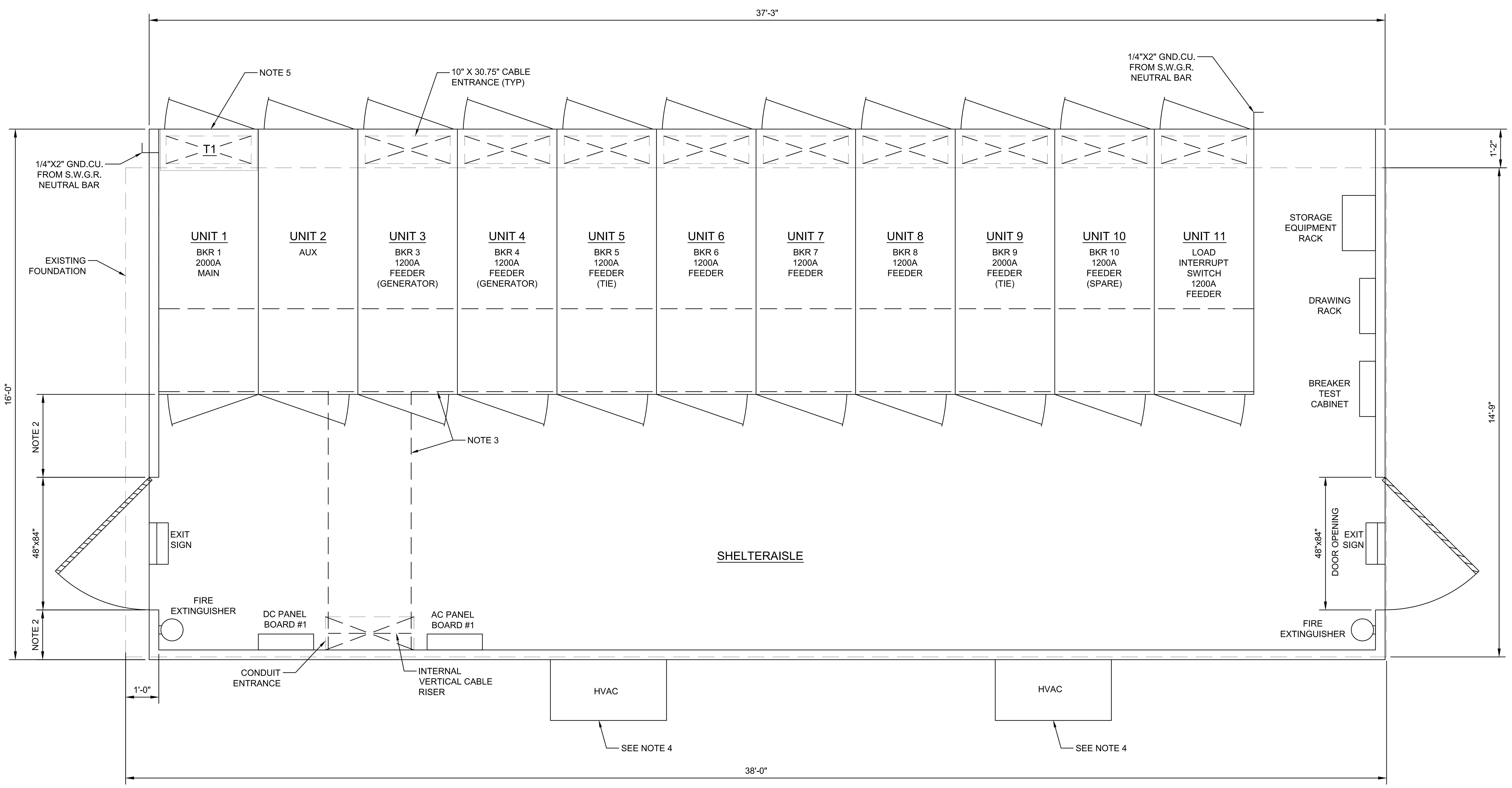
Melanie Jane Parker
2024.01.03 15:09:06-06'00'
MELANIE JANE PARKER - ENGINEER
MO# PE-2018000256

DATE	REVISION	#
12/19/2023	ISSUED FOR BID	0
01/03/2024	REVISED FOR BID	1

TOTH & ASSOCIATES
1550 E. REPUBLIC ROAD
SPRINGFIELD, MO 65804
Ph: 417-888-0645 Fax: 417-888-0657
www.tothassociates.com
CERTIFICATE OF AUTHORITY:
MO# E-2004004242-D

DWN. BY: SJT
CKD. BY: NTM
APPD. BY: MJP
DATE: 11/21/2023
SCALE: NONE
Graphic scale may change due to drawing reproduction

PROJECT: MIAMI SUBSTATION
LOCATION: 310 N MIAMI AVE, MARSHALL MO 65340
CLIENT: MARSHALL MUNICIPAL UTILITIES
MARSHALL, MO
TITLE: SWITCHGEAR NO. 1 UNIT 11
EQUIPMENT LAYOUT
SHT NO: ER-311



N

NOTES:

1. THIS DRAWING IS A CONCEPTUAL LAYOUT OF THE PROPOSED MIAMI #1 SWITCHGEAR ENCLOSURE. SUPPLIER SHALL DEVELOP FABRICATION DRAWINGS AND LOCATE EQUIPMENT AS REQUIRED BY DESIGN FOR COMPLIANCE WITH 2020 NEC, 2017 NESC AND APPLICABLE BUILDING CODES/INDUSTRY STANDARDS.
2. DIMENSIONS TO BE DETERMINED BY SUPPLIER.
3. CABLE TRAY SIZE TO BE DETERMINED BY SUPPLIER.
4. QUANTITY, SIZE, AND LOCATION OF HVAC UNITS TO BE DETERMINED BY SUPPLIER.
5. MANUFACTURER TO DESIGN, FABRICATE AND INSTALL EXTERIOR ROOF-MOUNTED GASKETED BUS DUCT AND COPPER CONDUCTOR CONNECTIONS TO TRANSFORMER T1.
6. SPARE 1200A BREAKER TO BE INSTALLED IN CUBICLE 10.

DRAWINGS AND SPECIFICATIONS ARE NOT INTENDED FOR USE ON OTHER PROJECTS AT THIS SITE OR OTHER SITES WITHOUT WRITTEN APPROVAL OF THE ENGINEER.

STATE OF MISSOURI
ZACHARY R. MARSDEN
NUMBER
PE-2017000330
PROFESSIONAL ENGINEER

Digitally signed by Zachary R. Marsden
Date: 2024.01.03 15:59:02-06'00'
ZACHARY R. MARSDEN - ENGINEER
MO# PE-2017000330

DATE	REVISION	#
12/19/23	ISSUED FOR BID	0
01/03/24	REVISED FOR BID	1

TOTH & ASSOCIATES
1550 E. REPUBLIC ROAD
SPRINGFIELD, MO 65804
Ph: 417-888-0645 Fax: 417-888-0657
www.tothassociates.com
CERTIFICATE OF AUTHORITY:
MO# E-2004004242-D

DWN. BY: AJH
CKD. BY: ZRM
APPD. BY: ZRM
DATE: 11/27/23
SCALE: NONE
Graphic scale may change due to drawing reproduction

PROJECT: MIAMI 1 SUBSTATION SUBSTATION REBUILD
LOCATION: 310 N MIAMI AVE, MARSHALL MO 65340
CLIENT: MARSHALL MUNICIPAL UTILITIES MARSHALL, MISSOURI MISSOURI - MARSHALL
TITLE: SWITCHGEAR ENCLOSURE LAYOUT
SHT NO: SE-301

Contractor's Request for Information (RFI) Form

Technical questions regarding this solicitation should be submitted no later than 5:00 pm local time on May 1, 2025, utilizing this RFI Form. Email completed RFI forms in PDF format to Mr. Zachary Marsden at zmarsden@tothassociates.com or submit by fax to (417) 888-0657. RFIs not submitted in compliance with these instructions may not be acknowledged. Please use a separate form for each inquiry.

Project: Miami 1 Substation Rebuild: Switchgear
Owner: Marshall Municipal Utilities
Bid Due Date: 05/08/2025

TO BE COMPLETED BY CONTRACTOR

Information Requested (include drawing number or specification page number, if applicable):	
Submitted By:	Date:

TO BE COMPLETED BY TOTH & ASSOCIATES

Response:	
Response By:	Date: