Event # 134

Name: GTL Switchgear Direct Purchase

Description: This project is located at 1801 Eisenhower Boulevard, in the City of Fort Lauderdale. The work to be accomplished under this contract includes, but is not limited to, furnish and deliver electrical switchgear and associated equipment.

This event replaces event #105

Buyer: Mohammed, Stefan

Status: Pending Award

Event Type: IFB

Currency: USD

Sealed Bid: Yes

Respond To All Lines: No

Q & A Allowed: Yes

Number Of Amendments: 2

Open Date: 06/12/2023 10:30:00 AM

Q And A Open: 06/12/2023 12:00:00 PM

Close Date: 07/12/2023 02:00:00 PM

Q And A Close: 07/03/2023 12:00:00 PM

Contacts

Name	Email Address
Stefan Mohammed	SMohammed@fortlauderdale.gov

Questions

Question
Did you complete all the required forms?

Attachments

Name	Attachment
1. General Conditions - Rev 10-2022.pdf	1. General Conditions - Rev 10-2022.pdf

Event # 134: GTL Switchgear Direct Purchase

Name	Attachment
Event 134- Electrical Switchgear.pdf	Event 134- Electrical Switchgear.pdf

Line Details

Line 1: ITB 12529 GTL Switchgear Direct Purchase

Description: ITB 12529 GTL Switchgear Direct Purchase

Item: ITB 12529 GTL SWITCHGEAR DIRECT ITB 12529 GTL Switchgear Direct Purchase

Long Item Description: Please see technical specifications for more information.

Commodity Code: 285-67 Power Systems Switchgears and Related Accessories

Quantity: 1.0000 **Unit of Measure:** EA **Requested Delivery Date:** 06/30/2023

Require Response: No **Price Breaks Allowed:** No **Allow Alternate Responses:** No

Add On Charges Allowed: No

SECTION I – INTRODUCTION AND INFORMATION

1.1 Purpose

The City of Fort Lauderdale, Florida (City) is seeking bids from qualified, experienced, and licensed firm(s), hereinafter referred to as the Contractor or Bidder, to furnish and deliver electrical switchgear and associated equipment for the City, in accordance with the terms, conditions, and specifications contained in this Invitation to Bid (ITB).

1.2 Point of Contact

For information concerning procedures for responding to this solicitation, contact Procurement Specialist, Stefan Mohammed, at (954) 828- 5351or email at Smohammed@fortlauderdale.gov. Such contact shall be for clarification purposes only.

For information concerning technical specifications, please utilize the question / answer feature provided by the City's on-line strategic sourcing platform. Questions of a material nature must be received prior to the cut-off date specified in the ITB schedule. Material changes, if any, to the scope of services or bidding procedures will only be transmitted by written addendum. Bidders please note: No part of your bid can be submitted via FAX. No variation in price or conditions shall be permitted based upon a claim of ignorance. Submission of a bid will be considered evidence that the Bidder has familiarized themselves with the nature and extent of the work, and the equipment, materials, and labor required. The entire bid response must be submitted in accordance with all specifications contained in this solicitation. The questions and answers submitted in the City's on-line strategic sourcing platform shall become part of any contract that is created from this ITB.

1.3 Pre-bid Conference and/or Site Visit

It will be the sole responsibility of the Bidder to become familiar with the scope of the City's requirements and systems prior to submitting a bid. No variation in price or conditions shall be permitted based upon a claim of ignorance. Submission of a bid will be considered evidence that the Bidder has familiarized themselves with the nature and extent of the work, equipment, materials, and labor required.

1.4 CITY'S ON-LINE STRATEGIC SOURCING PLATFORM

The City of Fort Lauderdale uses its own on-line strategic sourcing platform to administer the competitive solicitation process, including but not limited to soliciting bids, issuing addenda, posting results, and issuing notification of an intended decision. There is no charge to register and download the ITB from the City's on-line strategic sourcing platform. Bidders are strongly encouraged to read the supplier tutorials available in the City's on-line strategic sourcing platform well in advance of their intention of submitting a bid to ensure familiarity with the use of the City's on-line strategic sourcing platform. The City shall not be responsible for a Bidder's inability to submit a Bid by the end date and time for any reason, including issues arising from the use of the City's on-line strategic sourcing platform.

It is the sole responsibility of the Bidder to ensure that their bid is submitted electronically through the City's on-line strategic sourcing platform no later than the time and date specified in this solicitation. PAPER BID SUBMITTALS WILL NOT BE ACCEPTED. BIDS MUST BE SUBMITTED ELECTRONICALLY VIA the City's on-line strategic sourcing platform..

1.5 Electronic Bid Openings

Please be advised that effective immediately, and until further notice, all Invitation to Bids, Request for Proposals, Request for Qualifications, and other solicitations led by the City of Fort Lauderdale will be opened electronically via BIDSYNC.COM at the date and time indicated on the solicitation. All openings will be held on the BIDSYNC.COM platform.

Anyone requesting assistance or having further inquiry in this matter must contact the Procurement Specialist indicated on the solicitation, via the Question-and-Answer forum on Bidsync.com before the Last Day for Questions indicated in the Solicitation.

END OF SECTION

SECTION II - SPECIAL TERMS AND CONDITIONS

2.1 General Conditions

ITB General Conditions (Form G-107, Rev. 09/20) are included and made a part of this ITB.

2.2 Addenda, Changes, and Interpretations

It is the sole responsibility of each firm to notify the Procurement Specialist utilizing the question / answer feature provided by BidSync and request modification or clarification of any ambiguity, conflict, discrepancy, omission, or other error discovered in this competitive solicitation. Requests for clarification, modification, interpretation, or changes must be received prior to the Question and Answer (Q & A) Deadline. Requests received after this date may not be addressed. Questions and requests for information that would not materially affect the scope of services to be performed or the solicitation process will be answered within the question / answer feature provided by BidSync and shall be for clarification purposes only. Material changes, if any, to the scope of services or the solicitation process will only be transmitted by official written addendum issued by the City and uploaded to BidSync as a separate addendum to the ITB. Under no circumstances shall an oral explanation given by any City official, officer, staff, or agent be binding upon the City and should be disregarded. All addenda are a part of the competitive solicitation documents, and each firm will be bound by such addenda. It is the responsibility of each to read and comprehend all addenda issued.

2.3 Changes and Alterations

Bidder may change or withdraw a Bid at any time prior to Bid submission deadline; however, no oral modifications will be allowed. Modifications shall not be allowed following the Bid deadline.

2.4 Bidder's Costs

The City shall not be liable for any costs incurred by Bidders in responding to this ITB.

2.5 Pricing/Delivery

All pricing should be identified on the Cost page provided in this ITB. No additional costs may be accepted, other than the costs stated on the Cost page. Failure to use the City's Cost page and provide costs as requested in this ITB may deem your bid non-responsive.

All pricing must include delivery and installation and be quoted FOB: Destination. Refer to section 26 13 13 of the technical specifications for more detailed delivery instructions.

2.6 Price Validity

Prices provided in this Invitation to bid (ITB) shall be valid for at least One-Hundred and Twenty (120) days from time of ITB opening unless otherwise extended and agreed upon by the City and Bidder. The City shall award contract within this time period or shall request to the recommended awarded vendor an extension to hold pricing, until products/services have been awarded.

2.7 Invoices/Payment

Payment terms will be considered to be net 45 days after the date of satisfactory delivery at the place of acceptance and receipt of correct invoice at the office specified, whichever occurs last, in accordance with the Florida Local Government Prompt Payment Act. Bidder may offer cash discounts for prompt payment, but they will not be considered in determination of award.

2.8 Related Expenses/Travel Expenses

All costs including travel are to be included in your bid. The City will not accept any additional costs.

.

2.9 Payment Method

The City of Fort Lauderdale has implemented a Procurement Card (P-Card) program which changes how payments are remitted to its vendors. The City has transitioned from traditional paper checks to payment by credit card via MasterCard or Visa. This allows you as a vendor of the City of Fort Lauderdale to receive your payment fast and safely. No more waiting for checks to be printed and mailed. Payments will be made utilizing the City's P-Card (MasterCard or Visa). Accordingly, firms must presently have the ability to accept credit card payment or take whatever steps necessary to implement acceptance of a credit card before the commencement of a contract. See Contract Payment Method form attached.

2.10 Mistakes

The Bidder shall examine this ITB carefully. The submission of a bid shall be prima facie evidence that the Bidder has full knowledge of the scope, nature, and quality of the work to be performed; the detailed requirements of the specifications; and the conditions under which the work is to be performed. Ignorance of the requirements will not relieve the Bidder from liability and obligations under the Contract.

2.11 Acceptance of Bids / Minor Irregularities

2.11.1 The City reserves the right to accept or reject any or all bids, part of bids, and to waive minor irregularities or variances to specifications contained in bids which do not make the bid conditional in nature and minor irregularities in the solicitation process. A minor irregularity shall be a variation from the solicitation that does not affect the price of the contract or does not give a bidder an advantage or benefit not enjoyed by other bidders, does not adversely impact the interests of other firms, or does not affect the fundamental fairness of the solicitation process. The City also reserves the right to reissue an ITB.

2.11.2 The City reserves the right to disqualify Bidder during any phase of the competitive solicitation process and terminate for cause any resulting contract upon evidence of collusion with intent to defraud or other illegal practices on the part of the Bidder.

2.12 Modification of Services

2.12.1 While this contract is for services provided to the department referenced in this ITB, the City may require similar work for other City departments. Successful Bidder agrees to take on such work unless such work would not be considered reasonable or become an undue burden to the Successful Bidder.

2.12.2 The City reserves the right to delete any portion of the work at any time without cause, and if such right is exercised by the City, the total fee shall be reduced in the same ratio as the estimated cost of the work deleted bears to the estimated cost of the work originally planned. If work has already been accomplished and approved by the City on any portion of a contract resulting from this ITB, the Successful Bidder shall be paid for the work completed on the basis of the estimated percentage of completion of such portion to the total project cost.

2.12.3 The City may require additional items or services of a similar nature, but not specifically listed in the contract. The Successful Bidder agrees to provide such items or services and shall provide the City prices on such additional items or services. If the price(s) offered are not acceptable to the City, and the situation cannot be resolved to the satisfaction of the City, the City reserves the right to procure those items or services from

other vendors, or to cancel the contract upon giving the Successful Bidder thirty (30) days written notice.

2.12.4 If the Successful Bidder and the City agree on modifications or revisions to the task elements, after the City has approved work to begin on a particular task or project, and a budget has been established for that task or project, the Successful Bidder will submit a revised budget to the City for approval prior to proceeding with the work.

2.13 Non-Exclusive Contract

Bidder agrees and understands that the contract shall not be construed as an exclusive arrangement and further agrees that the City may, at any time, secure similar or identical services from another vendor at the City's sole option.

2.14 Sample Contract Agreement

A sample of the formal agreement template, which may be required to be executed by the awarded vendor can be found at our website:
https://www.fortlauderdale.gov/home/showdocument?id=1212

2.15 Responsiveness

In order to be considered responsive to the solicitation, the firm's bid shall fully conform in all material respects to the solicitation and all of its requirements, including all form and substance.

2.16 Responsibility

In order to be considered as a responsible firm, firm shall be fully capable to meet all of the requirements of the solicitation and subsequent contract, must possess the full capability, including financial and technical, to perform as contractually required, and must be able to fully document the ability to provide good faith performance.

2.17 Minimum Qualifications

To be eligible for award of a contract in response to this solicitation, the Bidder must demonstrate that they have successfully completed services, as specified in the Technical Specifications / Scope of Services section of this solicitation, are normally and routinely engaged in performing such services, and are properly and legally licensed to perform such work. In addition, the Bidder must have no conflict of interest with regard to any other work performed by the Bidder for the City of Fort Lauderdale.

2.17.1 Firm or principals shall have no record of judgments, pending lawsuits against the City or criminal activities involving moral turpitude and not have any conflicts of interest that have not been waived by the City Commission.

2.17.2 Neither firm nor any principal, officer, or stockholder shall be in arrears or in default of any debt or contract involving the City, (as a party to a contract, or otherwise); nor have failed to perform faithfully on any previous contract with the City.

2.18 Lobbying Activities

ALL CONTRACTORS PLEASE NOTE: Any contractor submitting a response to this solicitation must comply, if applicable, with City of Fort Lauderdale Ordinance No. C-11-42 & Resolution No. 07-101, Lobbying Activities. Copies of Ordinance No. C-11-42 and Resolution No. 07-101 may be obtained from the City Clerk's Office on the 7th Floor of City Hall, 100 N. Andrews Avenue, Fort Lauderdale, Florida. The ordinance may also be viewed on the City's website at http://www.fortlauderdale.gov/home/showdocument?id=6036.

2.19 Local Business Preference – N/a

2.20 Disadvantaged Business Enterprise Preference – N/A

2.21 Protest Procedure

2.21.1 Any Bidder who is not recommended for award of a contract and who alleges a failure by the city to follow the city's procurement ordinance or any applicable law, may follow the protest procedure as found in the city's procurement ordinance within five (5) days after a notice of intent to award is posted on the city's web site at the following link. https://www.fortlauderdale.gov/government/departments-a-h/finance/procurement-services/notices-of-intent-to-award.

2.21.2 The complete protest ordinance may be found on the city's web site at the following link: https://library.municode.com/fl/fort_lauderdale/codes/code_of_ordinances?nodeId=COOR_CH2AD_ARTVFI_DIV2PR_S2-182DIREPR

2.22 Public Entity Crimes

Bidder, by submitting a bid, certifies that neither the Bidder nor any of the Bidder's principals has been placed on the convicted vendor list as defined in Section 287.133, Florida Statutes (2018), as may be amended or revised. A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals, or replies on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in s. 287.017 for CATEGORY TWO for a period of 36 months following the date of being placed on the convicted vendor list.

2.23 Sub-Contractors

2.23.1 If the Contractor proposes to use sub-contractors in the course of providing these services to the City, this information shall be a part of the bid response. Such information shall be subject to review, acceptance, and approval of the City, prior to any contract award. The City reserves the right to approve or disapprove of any sub-contractor candidate in its best interest and to require Contractor to replace sub-contractor with one that meets City approval.

2.23.2 Contractor shall ensure that all of Contractor's sub-contractors perform in accordance with the terms and conditions of this Contract. Contractor shall be fully responsible for all of Contractor's sub-contractors' performance, and liable for any of Contractor's sub-contractors' non-performance and all of Contractor's sub-contractors' acts and omissions. Contractor shall defend, at Contractor's expense, counsel being subject to the City's approval or disapproval, and indemnify and hold harmless the City and the City's officers, employees, and agents from and against any claim, lawsuit, third-party action, or judgment, including any award of attorney fees and any award of costs, by or in favor of any Contractor's sub-contractors for payment for work performed for the City.

2.23.3 Contractor shall require all of its sub-contractors to provide the required insurance coverage as well as any other coverage that the Contractor may consider necessary, and any deficiency in the coverage or policy limits of said sub-contractors will be the sole responsibility of the Contractor.

2.24 Bid Security – N/A

2.25 Payment and Performance Bond – N/A

2.26 Insurance Requirements

2.26.1 As a condition precedent to the effectiveness of this Agreement, during the term of this Agreement and during any renewal or extension term of this Agreement, the Contractor, at its sole expense, shall provide insurance of such types and with such terms and limits as noted below. Providing proof of and maintaining adequate insurance coverage are material obligations of the Contractor. The Contractor shall provide the City a certificate of insurance evidencing such coverage. The Contractor's insurance coverage shall be primary insurance for all applicable policies. The limits of coverage under each policy maintained by the Contractor shall not be interpreted as limiting the Contractor's liability and obligations under this Agreement. All insurance policies shall be through insurers authorized or eligible to write policies in the State of Florida and possess an A.M. Best rating of A-, VII or better, subject to approval by the City's Risk Manager.

2.26.2 The coverages, limits, and endorsements required herein protect the interests of the City, and these coverages, limits, and/or endorsements shall in no way be relied upon by the Contractor for assessing the extent or determining appropriate types and limits of coverage to protect the Contractor against any loss exposures, whether as a result of this Agreement or otherwise. The requirements contained herein, as well as the City's review or acknowledgement, are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by the Contractor under this Agreement.

2.26.3 The following insurance policies and coverages are required:

Commercial General Liability

Coverage must be afforded under a Commercial General Liability policy with limits not less than:

- $1,000,000 each occurrence and $2,000,000 aggregate for Bodily Injury, Property Damage, and Personal and Advertising Injury
- $1,000,000 each occurrence and $2,000,000 aggregate for Products and Completed Operations

Policy must include coverage for contractual liability and independent contractors.

The City, a Florida municipal corporation, its officials, employees, and volunteers are to be covered as an additional insured with a CG 20 26 04 13 Additional Insured – Designated Person or Organization Endorsement or similar endorsement providing equal or broader Additional Insured Coverage with respect to liability arising out of activities performed by or on behalf of the Contractor. The coverage shall contain no special limitation on the scope of protection afforded to the City, its officials, employees, and volunteers.

Business Automobile Liability

Coverage must be afforded for all Owned, Hired, Scheduled, and Non-Owned vehicles for Bodily Injury and Property Damage in an amount not less than $1,000,000 combined single limit each accident.

If the Contractor does not own vehicles, the Contractor shall maintain coverage for Hired and Non-Owned Auto Liability, which may be satisfied by way of endorsement to the Commercial General Liability policy or separate Business Auto Liability policy.

Workers' Compensation and Employer's Liability

Coverage must be afforded per Chapter 440, Florida Statutes. Any person or entity performing work for or on behalf of the City must provide Workers' Compensation insurance. Exceptions and exemptions will be allowed by the City's Risk Manager, if they are in accordance with Florida Statute.

The Contractor waives, and the Contractor shall ensure that the Contractor's insurance carrier waives, all subrogation rights against the City, its officials, employees, and volunteers for all losses or damages. The City requires the policy to be endorsed with WC 00 03 13 Waiver of our Right to Recover from Others or equivalent.

The Contractor must be in compliance with all applicable State and federal workers' compensation laws, including the U.S. Longshore Harbor Workers' Act and the Jones Act, if applicable.

2.26.4 Insurance Certificate Requirements

- **a.** The Contractor shall provide the City with valid Certificates of Insurance (binders are unacceptable) no later than ten (10) days prior to the start of work contemplated in this Agreement.
- **b.** The Contractor shall provide to the City a Certificate of Insurance having a thirty (30) day notice of cancellation; ten (10) days' notice if cancellation is for nonpayment of premium.
- **c.** In the event that the insurer is unable to accommodate the cancellation notice requirement, it shall be the responsibility of the Contractor to provide the proper notice. Such notification will be in writing by registered mail, return receipt requested, and addressed to the certificate holder.
- **d.** In the event the Agreement term or any surviving obligation of the Contractor following expiration or early termination of the Agreement goes beyond the expiration date of the insurance policy, the Contractor shall provide the City with an updated Certificate of Insurance no later than ten (10) days prior to the expiration of the insurance currently in effect. The City reserves the right to suspend the Agreement until this requirement is met.
- **e.** The Certificate of Insurance shall indicate whether coverage is provided under a claims-made or occurrence form. If any coverage is provided on a claims-made form, the Certificate of Insurance must show a retroactive date, which shall be the effective date of the initial contract or prior.
- **f.** The City shall be named as an Additional Insured on all liability policies, with the exception of Workers' Compensation.
- **g.** The City shall be granted a Waiver of Subrogation on the Contractor's Workers' Compensation insurance policy.
- **h.** The title of the Agreement, Bid/Proposal/Contract number, event dates, or other identifying reference must be listed on the Certificate of Insurance.

The Certificate Holder should read as follows:
City of Fort Lauderdale

Procurement Services Division
100 N. Andrews Avenue
Fort Lauderdale, FL 33301

2.26.5 The Contractor has the sole responsibility for all insurance premiums and shall be fully and solely responsible for any costs or expenses as a result of a coverage deductible, co-insurance penalty, or self-insured retention; including any loss not covered because of the operation of such deductible, co-insurance penalty, self-insured retention, or coverage exclusion or limitation. Any costs for adding the City as an Additional Insured shall be at the Contractor's expense.

2.26.6 If the Contractor's primary insurance policy/policies do not meet the minimum requirements, as set forth in this Agreement, the Contractor may provide evidence of an Umbrella/Excess insurance policy to comply with this requirement.

2.26.7 The Contractor's insurance coverage shall be primary insurance as respects to the City, a Florida municipal corporation, its officials, employees, and volunteers. Any insurance or self-insurance maintained by the City, a Florida municipal corporation, its officials, employees, or volunteers shall be non-contributory.

2.26.8 Any exclusion or provision in any insurance policy maintained by the Contractor that excludes coverage required in this Agreement shall be deemed unacceptable and shall be considered breach of contract.

2.26.9 All required insurance policies must be maintained until the contract work has been accepted by the City, or until this Agreement is terminated, whichever is later. Any lapse in coverage shall be considered breach of contract. In addition, Contractor must provide to the City confirmation of coverage renewal via an updated certificate should any policies expire prior to the expiration of this Agreement. The City reserves the right to review, at any time, coverage forms and limits of Contractor's insurance policies.

2.26.10 The Contractor shall provide notice of any and all claims, accidents, and any other occurrences associated with this Agreement shall be provided to the Contractor's insurance company or companies and the City's Risk Management office as soon as practical.

2.26.11 It is the Contractor's responsibility to ensure that any and all of the Contractor's independent contractors and subcontractors comply with these insurance requirements. All coverages for independent contractors and subcontractors shall be subject to all of the applicable requirements stated herein. Any and all deficiencies are the responsibility of the Contractor.

2.27 Insurance – Sub-Contractors

Contractor shall require all its Sub-Contractors to provide the aforementioned coverage as well as any other coverage that the Contractor may consider necessary, and any deficiency in the coverage or policy limits of said Sub-Contractors will be the sole responsibility of the Contractor.

2.28 Insurance for Collection of Credit Card Payments

The successful Contractor will need to provide proof that they maintain insurance coverage in an amount of not less than $1,000,000 specifically for cyber related crimes relating to the transmission of credit card information over their website that can include but are not limited to criminal activity involving the information technology infrastructure, including illegal access

(unauthorized access), illegal interception (by technical means of non-public transmissions of computer data to, from or within a computer system), data interference (unauthorized damaging, deletion, deterioration, alteration or suppression of computer data), systems interference (interfering with the functioning of a computer system by inputting, transmitting, damaging, deleting, deteriorating, altering or suppressing computer data), misuse of devices, forgery (ID theft), and electronic fraud.

2.29 Award of Contract

This is a one-time purchase, a purchase order shall be issued to successful bidder after award by commission.

2.30 Damage to Public or Private Property

Extreme care shall be taken to safeguard all existing facilities, site amenities, irrigation systems, vehicles, etc. on or around the job site. Damage to public and/or private property shall be the responsibility of the Contractor and shall be repaired and/or replaced at no additional cost to the City.

2.31 Safety

The Contractor(s) shall adhere to the Florida Department of Transportation's Uniform manual on Traffic Control for construction and maintenance work zones when working on or near a roadway. It will be the sole responsibility of the Contractor to make themselves and their employees fully aware of these provisions, especially those applicable to safety.

2.32 Uncontrollable Circumstances ("Force Majeure")

The City and Contractor will be excused from the performance of their respective obligations under this agreement when and to the extent that their performance is delayed or prevented by any circumstances beyond their control including, fire, flood, explosion, strikes or other labor disputes, act of God or public emergency, war, riot, civil commotion, malicious damage, act or omission of any governmental authority, delay or failure or shortage of any type of transportation, equipment, or service from a public utility needed for their performance, provided that:

2.32.1 The non-performing party gives the other party prompt written notice describing the particulars of the Force Majeure including, but not limited to, the nature of the occurrence and its expected duration, and continues to furnish timely reports with respect thereto during the period of the Force Majeure;

2.32.2 The excuse of performance is of no greater scope and of no longer duration than is required by the Force Majeure;

2.32.3 No obligations of either party that arose before the Force Majeure causing the excuse of performance are excused as a result of the Force Majeure; and

2.32.4 The non-performing party uses its best efforts to remedy its inability to perform. Notwithstanding the above, performance shall not be excused under this Section for a period in excess of two (2) months, provided that in extenuating circumstances, the City may excuse performance for a longer term. Economic hardship of the Contractor will not constitute Force Majeure. The term of the agreement shall be extended by a period equal to that during which either party's performance is suspended under this Section.

2.33 Canadian Companies

In the event Contractor is a corporation organized under the laws of any province of Canada or is a Canadian federal corporation, the City may enforce in the United States of America or in Canada or in both countries a judgment entered against the Contractor. The Contractor waives any and all defenses to the City's enforcement in Canada, of a judgment entered by a court in the United States of America. All monetary amounts set forth in this Contract are in United States dollars.

2.34 News Releases/Publicity

News releases, publicity releases, or advertisements relating to this contract, or the tasks or projects associated with the project shall not be made without prior City approval.

2.35 Approved Equal or Alternative Product Bids- N/A

Manufacturer/Brand/Model Specific Request

This is a manufacturer/brand/model specification. No substitutions will be allowed.

2.36 Contract Period- N/A

2.37 Cost Adjustments – N/A

2.38 Service Test Period – N/A

2.39 Contract Coordinator – N/A

2.40 Contractor Performance Reviews and Ratings – N/A

2.41 Substitution of Personnel – N/A

2.42 Ownership of Work – N/A

2.43 Condition of Trade-In Equipment – N/A

2.44 Conditions of Trade-In Shipment and Purchase Payment – N/A

2.45 Verification of Employment Status

Any Contractor/Consultant assigned to perform responsibilities under its contract with a State agency is required to utilize the US Department of Homeland Security's E-Verify system (per Executive Order Number 11-02) to verify the employment eligibility of: (a) all persons employed during the contract term by the Contractor to perform employment duties within Florida; and (b) all persons (including subcontractors) assigned by the Contractor to perform work pursuant to the contract with the State agency.

E-VERIFY Affirmation Statement must be completed and submitted with Bidder's response to this ITB.

2.46 Service Organization Controls – N/A

2.47 Warranties of Usage

Any estimated quantities listed are for information and tabulation purposes only. No warranty or guarantee of quantities needed is given or implied. It is understood that the Contractor will furnish the City's needs as they arise.

2.48 Rules and Submittals of Bids

The signer of the bid must declare that the only person(s), company or parties interested in the proposal as principals are named therein; that the bid is made without collusion with any other person(s), company or parties submitting a bid; that it is in all respects fair and in good faith, without collusion or fraud; and that the signer of the bid has full authority to bind the principal bidder.

2.49 Bid Tabulations/Intent to Award

Notice of Intent to Award Contract/Bid, resulting from the City's Formal solicitation process may be found at: http://www.fortlauderdale.gov/departments/finance/procurement-services/notices-of-intent-to-award. Tabulations of receipt of those parties responding to a formal solicitation may be found at: http://www.fortlauderdale.gov/departments/finance/procurement-services/bid-results, or any interested party may call the Procurement Services Division at 954-828-5933.

2.50 Public Records

All bids will become the property of the City. The Bidder's response to the ITB is a public record pursuant to Florida law, which is subject to disclosure by the City under the State of Florida Public Records Law, Florida Statutes Chapter 119.07 ("Public Records Law"). The City shall permit public access to all documents, papers, letters, or other material submitted in connection with this ITB and any resulting Contract to be executed for this ITB, subject to the provisions of Chapter 119.07 of the Florida Statutes. Any language contained in the Bidder's response to the ITB purporting to require confidentiality of any portion of the Bidder's response to the ITB, except to the extent that certain information is in the City's opinion a Trade Secret pursuant to Florida law, shall be void. If a Bidder submits any documents or other information to the City which the Bidder claims is Trade Secret information and exempt from Florida Statutes Chapter 119.07 ("Public Records Laws"), the Bidder shall clearly designate that it is a Trade Secret and that it is asserting that the document or information is exempt. The Bidder must specifically identify the exemption being claimed under Florida Statutes 119.07. The City shall be the final arbiter of whether any information contained in the Bidder's response to the ITB constitutes a Trade Secret. The city's determination of whether an exemption applies shall be final, and the Bidder agrees to defend, indemnify, and hold harmless the city and the city's officers, employees, and agent, against any loss or damages incurred by any person or entity as a result of the city's treatment of records as public records. In the event of Contract award, all documentation produced as part of the Contract shall become the exclusive property of the City.

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT PRRCONTRACT@FORTLAUDERDALE.GOV, 954-828-5002, CITY CLERK'S OFFICE, 100 N. ANDREWS AVENUE, FORT LAUDERDALE, FLORIDA 33301.

Contractor shall:

1. Keep and maintain public records required by the City in order to perform the service.

2. Upon request from the City's custodian of public records, provide the City with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes (2017), as may be amended or revised, or as otherwise provided by law.

3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of this contract if the Contractor does not transfer the records to the City.

4. Upon completion of the Contract, transfer, at no cost, to the City all public records in possession of the Contractor or keep and maintain public records required by the City to perform the service. If the Contractor transfers all public records to the City upon completion of this Contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of this Contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City, upon request from the City's custodian of public records, in a format that is compatible with the information technology systems of the City.

2.51 PCI (Payment Card Industry) Compliance

Contractor agrees to comply with all applicable state, federal and international laws, as well as industry best practices, governing the collection, access, use, disclosure, safeguarding and destruction of protected information.

Contractor and/or any subcontractor that handles credit card data must be, and remain, PCI compliant under the current standards and will provide documentation confirming compliance upon request by the City of Fort Lauderdale, failure to produce documentation could result in termination of the contract.

END OF SECTION

SECTION III - TECHNICAL SPECIFICATIONS/SCOPE OF SERVICES

SECTION 26 13 13

PARALLELING MEDIUM VOLTAGE SWITCHGEAR

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Furnish and acceptance test metal-clad, medium voltage, drawout vacuum circuit breaker switchgear and associated monitoring and control systems for paralleling standby generators and for distributing electrical power as shown on the Drawings and as herein specified. Installation shall be performed by others under a separate contract. It is the intent of this specification to provide a complete control and power distribution system for the operation of 4 generator units, rated 3,000 kW at 0.8 PF, 4,160 volts, 3 phase, 3 wire, 60 Hertz; complete in every detail whether or not indicated on the Drawings or specified. All components, testing, and services specified or required for a complete operable system shall be included. The switchgear shall consist of four (4) Generator Sections with integrated controls, one (1) System Master Control Section, one (1) Tie Section, two (2) Distribution Sections, and transition sections as necessary.

B. Section Includes: The work specified in this Section includes, but shall not be limited to, the following:

1. Medium voltage metalclad, drawout paralleling switchgear constructed to ANSI C37.20.2 standards.

C. Related Sections: Related sections include, but shall not be limited to, the following:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
2. Applicable general requirements for electrical work specified within Division 26 Specification Sections apply to this Section.
3. The following information is typically depicted on the Drawings: bus configuration, bus ratings, interrupting ratings, circuit breaker size and type, power line and feeder connections, elevation and footprint, etc. Where not shown on or able to be derived from the Drawings, the minimum requirements specified herein shall be provided.
4. Refer to specification Section 26 32 13 "Engine Generators" for individual generator protection.

D. Materials and equipment shall be delivered to the job site FOB, factory tested and ready for installation. The Manufacturer/Supplier shall be required to store and maintain the paralleling switchgear until the Owner is ready to accept delivery around June 1, 2024. The Manufacturer/Supplier shall provide full insurance coverage for all equipment and

appurtenances until its arrival at the job site. The manufacturer/supplier shall include in the bid a schedule which includes the time to generate shop drawings, manufacture equipment and delivery to site.

1.2 REFERENCES

A. General, Publications: The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. The edition/revision of the referenced publications shall be the latest date as of the date of the Contract Documents, unless otherwise specified.

1. American National Standards Institute (ANSI)
    a. ANSI/IEEE C37.20.2 - "IEEE Standard for Metal-Clad Switchgear"
    b. ANSI/IEEE C37.04 - "IEEE Standard Rating Structure for AC High Voltage Circuit Breakers"
    c. ANSI/IEEE C37.06 - "IEEE Standard for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis - "Preferred Rating and Related Required Capabilities for Voltages
    Above 1000V"
    d. ANSI/IEEE C37.11 - "IEEE Standard Requirements for Electrical Control for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis"
    e. ANSI/IEEE C37.09 - "IEEE Standard Test Procedure for AC High-Voltage Circuit Breakers
    Rated on a Symmetrical Current Basis"
    f. ANSI/IEEE C57.13 – "IEEE Standard Requirements for Instrument Transformers."
2. International Organization for Standardization (ISO):
    a. ISO 9001, "Quality Management Systems - Requirements"
3. National Electrical Manufacturers Association (NEMA):
    a. NEMA SG4 - "Alternating Current High Voltage Circuit Breakers"
    b. NEMA SG5 - "Power Switchgear Assemblies."
4. National Fire Protection Association (NFPA):
    a. NFPA 70, "National Electrical Code," (NEC)
5. International Building Code (IBC)
    a. Switchgear shall be provided with IBC certification and label

1.3 DEFINITIONS

A. Unless specifically defined within the Contract Documents, the words or acronyms contained within this specification shall be as defined within, or by the references listed within this specification, the Contract Documents, or, if not listed by either, by common industry practice.

1. PCS – Power Control System

2. BMS – Building Management System
3. EPMS – Electric Power Monitoring System
4. ATS – Automatic Transfer Switch
5. PLC – Programmable Logic Controller
6. OIT – Operator Interface Terminal
7. MV – Medium Voltage
8. AIC – Ampere Interrupting Capacity
9. BIL – Basic Impulse Level

1.4 SUBMITTALS

A. Submittals shall include the following as specified herein:

1. Deviations from the Contract Documents shall be indicated within the submittal. Each deviation shall reference the corresponding drawing or specification number and shall include a detailed written justification for the deviation.
2. Submit required product data and drawings specific to each product and accessory proposed. In addition, include the following information:
   a. Elevation drawings with shipping splits identified and estimated weights
   b. Outline drawings showing conduit entry areas and anchoring provisions.c. Single Line Diagram.
   d. Sequence of Operation including failure modes.
   e. System Sequencer which graphically and dynamically demonstrates system one line sequence of operation via animated sequences including failure recovery modes.
   f. Bill of material listing items by manufacturer's name, part number and description.
   g. Complete nameplate and status annunciator panel schedule.
   h. Technical literature for major components.
3. Seismic Qualification Certificates: For each Switchgear assembly provide the following:

a. Equipment shall be seismic shake table tested in accordance with ICC-ES AC-156 by an independent and certified seismic qualification agency.

b. Equipment shall be certified with Design Spectral Response Acceleration at Short Periods (SDS) equal to 2.46.

c. Switchgear shall be provided with IBC 2018 certification and label.

B. Operation & Maintenance (O&M) manuals shall be provided and shall include the following items.

1. Submit required Operations & Maintenance data specific to each product and accessory proposed. In addition, include the following information:

a. Complete set of drawings included the following:
   1) Elevations and plan views
   2) One-line diagrams
   3) Elementary schematics
   4) Power Control System (PCS) Network Architecture Diagram
   5) Detailed Interconnect Spreadsheet

b. Detailed Sequence of Operation

c. Manufacturer's standard operation and maintenance data.

d. Complete Bill of Material including furnished spare parts

e. Instruction Manuals for all Major Components including but not limited to synchronizing controllers, circuit breakers, programmable logic controllers, operator interface terminals, protective devices and meters.

f. Electronic O&M manual to be provided via secure link.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: The equipment described, as a minimum, shall meet all of the requirements specified in this section. The equipment shall be the product of a manufacturer who has produced paralleling switchgear for a period of no less than 25 years. The manufacturer must provide integral electrical and mechanical design, fabrication and construction services for all cubicle structures, formed and punched bus bar, and control panel assemblies. Comprehensive documentation detailing electrical and mechanical designs shall be available upon request.

1. The manufacturer shall have a valid ISO 9001 certification and an applicable quality assurance system that is regularly reviewed and audited by a third-party registrar. Manufacturing, inspection, and testing procedures shall be developed and controlled under the guidelines of the quality assurance system.
2. The manufacturer shall have service, repair, and technical support services available on a 24 hours 7 days a week basis.

B. Medium Voltage Paralleling Switchgear and required Monitoring & Control Stations shall be supplied by a single manufacturer.

C. All work performed and all materials used shall be in accordance with the National Electrical Code, and with applicable local regulations and ordinances. Equipment assemblies, materials, and equipment shall be listed and labeled by Underwriter's Laboratories or by a testing agency acceptable to authorities having jurisdiction and marked for intended use.

D. Order Management: Management of orders shall be assigned to personnel employed and trained specifically and exclusively for project management; the use of field service representatives, design engineers or sales representatives for order management purposes shall not be acceptable. Each order shall be managed by both a factory-based project manager and a factory-direct field-based project manager.

1.6 DELIVERY, STORAGE AND HANDLING

A. Prior to delivery to the Project site, the electrical contractor shall ensure that suitable storage space is available to store materials in a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, humidity, and corrosive atmospheres. Materials shall be protected during delivery and storage and shall not exceed the manufacturer stated storage requirements. As a minimum, store indoors in clean, dry space with uniform temperature to prevent condensation. In addition, protect electronics from all forms of electrical and magnetic energy that could reasonably cause damage.

B. Electrical Contractor shall deliver materials to the Project site in supplier's or manufacturer's original wrappings and containers, labeled with supplier's or manufacturer's name, material or product brand name, and equipment tag number or service name as identified within the Contract Documents.

C. Electrical Contractor shall inspect and report any concealed damage or violation of delivery storage, and handling requirements to the Engineer.

1.7 WARRANTY AND SERVICE

The Manufacturer shall warrant the equipment for a minimum of 60 months from date of shipment subject to terms and conditions of manufacturer's current warranty publication.

B. Manufacturer shall have an established network of factory-direct service technicians capable of servicing the equipment.

C. Manufacturer's field service representatives shall be on call and available for immediate dispatch 24 hours a day, 365 days a year. All field service personnel shall be factory trained, by the manufacturer, and certified in the maintenance and repair of the specified equipment. Manufacturer must employ a minimum of 2 field service technicians within a 150 mile radius of the installation site. Field service representatives shall have access to common replacement components locally and the service organization shall have a detailed counter-tocounter process for providing emergency spares 24 hours a day 7 days a week.

D. Post-warranty service contracts shall be made available to the owner by the manufacturer to provide scheduled maintenance and/or emergency repair of the equipment.

1.8 SPECIAL TOOLS AND SPARE PARTS

A. Spare parts shall be provided for each type and size of unit installed. At a minimum, the following shall be provided:

1. Provide the minimum spare parts recommended by the manufacturer.
2. Provide 1 set of each type of control fuse installed within equipment
3. Provide 1 set of each type of indicating lights installed within equipment
4. Portable Circuit Breaker Lifting Device
5. Circuit Breaker Test Cabinet and Test Jumper Cable
6. Provide 1 motorized remote control racking accessory

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Products: Switchgear specified herein shall be the product of a single manufacturer. Products and manufacturers specified are to establish a standard of quality for design, function, materials, and appearance. Provide the following specified product and manufacturer without exception, unless approved as a substitute by addendum to the Contract Documents prior to the bid date:

1. ASCO Power Technologies
2. Russelectric

2.2 GENERAL REQUIREMENTS

A. The following paralleling switchgear information is typically shown on the Drawings: bus configuration, bus ratings, interrupting ratings, component size and type, power line and feeder connections, elevation and footprint, etc. Where not shown on or able to be derived from the Drawings, the minimum requirements specified herein shall be provided.

B. System ampacity shall be 3,000A. All horizontal bus shall be rated to the full ampacity of the system.

C. Maximum Design Voltage shall be 4.76kV.

D. Circuit Breaker Interrupting Rating shall be 50kAIC

E. Impulse Withstand (Basic Impulse Level) shall be 60kV.

F. Power Frequency Withstand shall be 19kV, 1 minute test.Main Bus Ampacity shall be 3,000 amps, continuous.

H. Momentary Current Ratings shall be equal to the circuit breaker close and latch rating

2.3 STRUCTURE

A. General/Construction: The enclosure shall be free-standing, and floor supported, with front and rear access. An adequate number of anchor bolt holes shall be designed to place the base in direct contact with the foundation when bolted. The flatness of the floor surface upon which the equipment is installed shall deviate no more than 0.125 inches per 10 feet in any direction. Minimum sheet metal thickness shall be 11 gauge steel on all exterior surfaces. All doors shall be provided with sufficient hinges to support the door and components. Doors must swing open more than 90 degrees. Front doors shall be supplied with a lockable handle. Rear doors shall be supplied on all bussed sections. All door locks shall be keyed alike, with one key supplied for each lock. All panel covers shall be formed type and secured with screws as necessary.

B. The sheet steel used for the finished assembly shall be degreased and thoroughly cleaned through a minimum five stage aqueous process. The finish shall be ANSI-61, light gray, electrostatically charged powder paint over a phosphate coating, at an average of 2.0 mils. Finish shall be suitable for indoor and outdoor environments.

C. Bus: The main bus shall be rated 3,000 amps and be fully insulated for its entire length with an epoxy coating. The conductors shall be tin-plated copper and be of a bolted design. The ground bus shall be 1/4" x 2" copper and shall extend through each compartment for the full length of the switchgear. Access to this compartment is gained from the front or rear of the structure by removing a steel barrier. Provide standard provisions for future extension, as applicable.

D. Lugs: Lugs shall be provided and shall be 2-hole compression type. Size, conductor type and quantity per conductor shall be as shown on the drawings.

E. Infrared viewing windows: Provide 3-inch minimum size viewing windows to allow the use of an infrared camera or thermal imager direct line of site to inspect electrical connections without requiring the opening of panels and doors. These windows shall be designed to allow thermographers the ability to inspect the electrical equipment without directly exposing themselves to live electrical components and energized devices.

F. Nameplates: Engraved laminated plastic nameplates, having black letters on white background, shall identify major components, vertical sections, and circuit breakers. Nameplates shall be attached with self-tapping screws.

G. Mimic Bus: Continuous mimic bus, arranged in single-line diagram format, using symbols and lettered designations consistent with approved mimic-bus diagram.

1. Mimic-bus segments coordinated with devices in switchgear sections to which applied, to produce a concise visual presentation of principal switchgear components and connections.
2. Laminated mimic bus shall be Red / Black and be Lamicoid attached with mechanical fasteners.

H. Control Wiring: AC voltage sensing wiring shall be SIS #14 AWG. CT wiring shall be SIS #12 AWG. All DC control wiring shall be a minimum of #18 SIS AWG. Current transformer circuit terminations shall be ring tongue type and include shorting terminal blocks.

1. Control wires shall be numbered every eight (8) inches or less, numbers shall be visible next to the terminals. Wiring shall be permanently marked at each end with wire termination designations that identify wire “to – from” terminal designations. Sleeve type wire markers are not acceptable. These designations shall include the device and connection point where the wire is terminated. All control wire markings shall be printed directly on the wire insulation and be permanent. Current Transformer wire shall be 12 gauge.
2. Low level signal circuits shall be separated and provided with shielded wire to minimize electromagnetic interference. Shielded wire shall be grounded at one point. Ethernet cabling shall be unshielded category 5 or higher.
3. Wiring between each section shall not be spliced and shall be free of abrasions and tool marks. Connections between cubicles shall use labeled connection plugs. Wires shall be placed in wire duct or harnessed and shall be supported to prevent sagging or breakage from weight or vibration. Inter-cubicle wiring harnesses shall be

contained in overhead steel wire troughs. Communication cables and current transformer circuits shall be hard wired.

4. All wiring to hinged doors shall be run through door terminal blocks or connection plugs. Terminal blocks shall be provided for all external connections and placed in an accessible area not exposed to hazardous bus or cables, if possible. Current transformer circuits shall be connected through shorting terminal blocks.

I. Stationary Structure

1. The switchgear shall consist of sections including circuit breaker compartments and auxiliary compartments as specified on drawings assembled to form a rigid self-supporting completely enclosed structure providing steel barriers between sections.

2. The sections shall be divided by metal barriers into the following separate compartments:

a. Circuit breaker, instrument, main bus, auxiliary device and cable. Each feeder section may have up to two circuit breaker compartments.

J. Circuit Breaker Compartment

1. Each circuit breaker compartment shall be designed to house a horizontal drawout metal-clad vacuum circuit breaker. The stationary primary disconnecting contacts are to be silver-plated copper and mounted within glass polyester support bushings. The movable contacts and springs shall be mounted on the circuit breaker element for ease of inspection/maintenance.

2. Entrance to the stationary primary disconnecting contacts shall be automatically covered by metal shutters when the circuit breaker is withdrawn from the connected position to the test or disconnected position or removed from the circuit breaker compartment. Ground bus shall be extended into the circuit breaker compartment to automatically ground the breaker frame with high-current spring type grounding contacts located on the breaker chassis when in the test and connected positions. Guide rails for positioning the circuit breaker and all other necessary hardware shall be an integral part of the circuit breaker compartment. Blocking devices shall interlock breaker frame sizes to prevent installation of a lower ampere rating or interrupting capacity element into a compartment designed for one of a higher rating. It shall be possible to install a circuit breaker into a bottom compartment without use of a transport truck or lift device.

K. Circuit Breakers:

The circuit breakers shall be rated 4,160 nominal volts, 4,760 maximum volts, 60 Hz, with a continuous current rating of 1,200 amps and a maximum symmetrical interrupting rating of 50kA - 4.76 kV system.

2. Furnish Square D Type VR circuit breakers with one vacuum interrupter per phase.

3. Breakers of same type and rating shall be completely interchangeable.

4. The circuit breaker shall be operated by means of a stored energy mechanism which is normally charged by a universal motor but can also be charged by the manual handle supplied on each VR breaker for manual emergency closing or testing.

5. The closing speed of the moving contacts shall be independent of both the control voltage and the operator.
6. A full front shield shall be provided on the breaker.
7. Secondary control circuits shall be connected automatically with a self-aligning, self-engaging plug and receptacle arrangement when the circuit breaker is racked into the connected position.
8. Provision shall be made for secondary control plug to be manually connected in test position.
9. A minimum of 6 auxiliary contacts and 5 MOC and 5 TOC type contacts, shall be provided for external use. The racking mechanism to move the breaker between positions shall be operable with the front door closed and position indication shall be visible with door closed.
10. An interlocking system shall be provided to prevent racking a closed circuit breaker to or from any position. An additional interlock shall automatically discharge the stored-energy operating mechanism springs upon removal of the breaker out of the compartment.

The circuit breaker control voltage shall be: 48 volts DC - one capacitor trip unit shall be provided for each circuit breaker when AC control power is required.

L. Surge Arresters

1. Surge Arresters shall be installed on each phase of all feeder exits and the incoming mains.
2. Surge Arresters shall be distribution class, Metal Oxide Varistors (MOV) type with polymer insulators. Minimum MCOV rating of 5kV.
3. All surge arresters shall be mounted in the cable termination compartments.
4. All surge arresters shall be solidly grounded with a copper cable to the ground bus in the respective cubicle.

M. Moving and Handling

1. The switchgear shall be provided with shipping splits at each section and shall be capable of being lifted overhead or by a forklift.
2. Each section shall be provided with removable lifting plates for overhead lifting purposes.

2.4 COMPONENTS

A. Metering Instrumentation: Analog metering instrumentation shall consist of industrial switchboard type meters, 4-1/2" square, 1% accuracy. Current and potential transformer ratios shall be selected and coordinated for nominal and rated values for ammeters, voltmeters and kW meters.

B. Instrument Switches: Instrument switches shall be of the rotary type. Each switch shall be supplied with a titled escutcheon plate, suitably marked for each position. The switches shall have positive means of maintaining contact, which shall be silver to silver with a wiping action.

C. Current Transformers: Current transformers shall be furnished with VA burden and relay class ratings suitable to supply the metering and protective devices without affecting accuracy.

D. Potential Transformers: Provide Two (2) open-delta connected drawout potential transformers with ratios as indicated on the drawings. Transformers shall have integrally mounted primary fuses. The transformers shall have mechanical rating equal to the momentary rating of the circuit breakers and shall have metering accuracy per ANSI Standards.

E. Alarm and Status Indication: Visual and audible alarm and status indication lights, including spares, shall be furnished as indicated by customer. Visual alarms shall be reset only after the fault condition has been corrected. The audible alarm shall include a silencing circuit which after activation shall permit audible annunciation of subsequent failures. Visual Alarms shall be provided via a solid-state status panel with redundant LEDs for each annunciation point. Lamp test shall be an integral feature of this indicator. Each illuminated indicator tile shall be 24 mm x 24 mm. Systems which provide some or all alarms via a touchscreen only are unacceptable.

F. Control Fuses: Fuses shall be mounted in locations where they are readily accessible. Pull-out type fuses shall be provided for all primary circuits and shall be of the current limiting type.

G. Electromagnetic Control Relays: All electromagnetic control relays shall be suitable and adequately rated for their intended service in the control system. All relays for control circuit duty shall be plug-in type with retaining clips and transparent plastic covers. Relays shall be clearly marked for control voltage. When possible, all relays shall have light-emitting diodes to indicate that the coil is energized.

2.5 PROTECTIVE RELAYS

A. Provide a protective relay for each circuit breaker as specified herein and Controllers and as indicated on the drawings. Protective relays shall meet the minimum requirements for the circuit breaker application (Generator, Main, Feeder, Busbar etc.) with the protection types (ANSI/IEEE C37.2 device numbers) and protection levels specified or shown. A separate Lockout Relay (Device 86) shall be provided for each protective relay.

2.6 GENERATOR POWER AND CONTROL SECTION

A. Generator Circuit Breaker: Each generator section shall contain over-current protection, controls, relays and auxiliary devices associated with its respective engine generator set. It shall include the following:

1. For each generator set, a medium voltage Square D type VR vacuum circuit breaker shall be furnished to provide paralleling functions. Circuit breakers shall be rated 4,160 nominal volts, 4,760 maximum volts, 60 Hz, with a continuous current rating of 1,200 amps and a maximum symmetrical interrupting rating of a maximum symmetrical interrupting rating of 40kA - 4.76 kV system.

2. Furnish circuit breakers with one vacuum interrupter per phase. Breakers of same type and rating shall be completely interchangeable. The circuit breaker shall be operated by means of a stored energy mechanism which is normally charged by a universal motor but can also be charged by the manual handle supplied on each breaker for manual emergency closing or testing. The closing speed of the moving contacts is to be independent of both the control voltage and the operator. Provide a full front shield on the breaker. A minimum of 6 auxiliary contacts and 5 MOC and 5 TOC type contacts, shall be provided for external use. The racking mechanism to move the breaker between positions shall be operable with the front door closed and position indication shall be visible with door closed.

3. Line Side Drawout type Potential Transformers, 2 Delta Connected ratio as shown on the drawings.

4. An interlocking system shall be provided to prevent racking a closed circuit breaker to or from any position. An additional interlock shall automatically discharge the stored-energy operating mechanism springs upon removal of the breaker out of the compartment.

5. The circuit breaker control voltage shall be 48 volts DC. Close and trip control power shall be independently monitored. Breaker closure shall be inhibited if trip power is unavailable.

6. A Circuit Breaker Trip Switch shall be provided with open/closed/tripped indicating LEDs.

B. Generator Control System

1. Paralleling controls for each generator shall include a programmable logic controller and a Woodward DSLC-2 digital synchronizer and load controller designed for use on three-phase AC generators and mounted in the switchgear. The controls shall combine a synchronizer (with voltage matching capability), load sensor, load control, dead bus closing system interlock, VAR, power factor and process control. The load sharing network and VAR sharing network shall be redundant and completely integrated in the switchgear with network status monitoring and diagnostics available via switchgear operator terminal screens. The controls shall sense true RMS power and provide soft loading and unloading functions on the main bus.

2. DC-to-DC converter(s) shall be provided in each generator control section to provide constant 24VDC power. The Generator Section DC-to-DC converter shall supplement the DC-to-DC converter in the Master Control section. A single DC-to-DC Convertor located in the Master Section only is not acceptable. Control power shall be sourced from generator set batteries and DC station battery system and sustain adequate control voltage during an engine crank. The converters shall provide power for up to 75% rated load if the source voltage drops to 12 volts.

3. Generator controls shall include the following functions, components, devices, and indicators:

    a. Reverse Power Protection (Device 32R)

b. Generator Voltage Monitoring and Frequency Monitoring

c. Generator controls shall monitor voltage and frequency to ensure the generator is not connected to the bus until frequency is at least 59 Hertz and 90% rated voltage.

d. Automatic Synchronizer

1) The synchronizer shall include a differential voltage detector, differential frequency detector and differential phase detector. Analog voltage bias signal shall be provided for voltage matching and an analog speed bias signal shall be provided for frequency matching and phase angle control. Synchronizer shall issue a breaker close signal when frequency, phase and voltage conditions are met.

2) The differential voltage detector shall compare the voltage of the oncoming generator to the paralleling bus. If the voltage is not within the factory set difference of plus or minus 5% (adjustable from 0 to plus or minus 10%), the voltage detector shall inhibit the circuit breaker from closing. When the oncoming generator voltage is within the preset acceptable limit, the inhibit shall be removed.

3) The differential frequency detector shall compare the frequency of the oncoming engine generator set to the paralleling bus. If the frequency is not within the preset acceptable difference of plus or minus 0.5 Hz (adjustable from 0 to plus or minus 0.5 Hz), the frequency detector shall inhibit the circuit breaker from closing. When the oncoming engine generator frequency is within the acceptable limit, the inhibit shall be removed.

4) The differential phase detector shall compare the phase angle of the oncoming engine generator set to the paralleling bus. If the phase angle is not within the preset acceptable difference of plus or minus 0.05 Hz (adjustable from plus/minus 0.02 to 0.25 Hz), the phase detector shall inhibit the circuit breaker from closing. When the oncoming engine generator phase angle is within the acceptable limit, the inhibit shall be removed.

e. Multiple Circuit Interlock: Generator controls shall provide for first-up, first-on operation of the generator set. This device shall positively prevent more than one set from being simultaneously connected to a dead bus. Upon initiation of the connection of the first set to the bus, this circuit shall shift the control of the remaining sets to automatic or manual synchronizing at the operator's discretion.

4.Generator Section Protective Relaying and Monitoring

a. A Schneider Electric Easergy P3G32 or equivalent Generator management relay shall be provided to provide complete protection and monitoring functions. Protections shall include:

1) Instantaneous overcurrent when offline (50)

2) High-set overcurrent (50)

3) Instantaneous and definite time overcurrent for ground (50/51GN)

4) Stator thermal modeling and RTD (49)

5) Negative sequence overcurrent (46)

6) Phase differential (87G) with a dedicated set of CT's
7) Over and undervoltage (59/27)
8) Reverse power for anti-motoring (32)
9) Voltage restrained phase overcurrent (51V)
10) Voltage phase reversal (47)
11) Loss of field (40 & 40Q)
12) Over and under frequency (81)

b. Monitoring and metering functions shall include:
1) RMS current, negative sequence current, voltage, three phase power, and temperature (via 12 RTDs)

c. Current and Voltage Test blocks shall be provided to facilitate testing of the relay.

d. A separate Lockout Relay (Device 86) shall be provided for each protective relay.

e. In conjunction with the generator differential (87G) protection above, which includes dedicated CT's in the switchgear as noted, another set of matching CT's shall be shipped loose with the switchgear to install on the generator for connection to the protective relay.

5.Programmable Logic Controller and Engine Controls

a. The automatic engine starting control shall be provided via a dedicated programmable logic controller and shall automatically start, protect, and monitor each engine generator set. The controller shall be provided with a power supply, CPU and required I/O modules. Engine start control shall additionally be provided with a hard-wired backup so that the engine can be automatically started without operator intervention if the controller is not available. Systems without hard wired backup are not acceptable. The programmable logic controller shall be dedicated for control exclusively of the engine generator set and shall be independent of the Master PLC. Distributed I/O systems which rely on a master controller shall not be acceptable. Loss of communication from the Master PLC to the Generator Programmable Controller shall not inhibit automatic engine start control, operation of the individual generator section controls or require the engine controls to be placed in manual mode to start their respective engines. Programmable Controller shall be Modicon type M340.

b. Engine Start/Stop Operation: The automatic engine control logic shall initiate operation of the engine upon receipt of a signal from a contact that closes for engine run and opens for engine stop.

c. Five Position Engine Control Selector Switch

1) Lockout/Reset - When placed in this position, the engine shall not be capable of starting and/or running from the ASCO controls. If the engine was shut down due to the operation of a protective device, the shutdown shall be reset when the switch is moved to this position. If the engine is running when the switch is moved to this position, it shall immediately shut down, the circuit breaker shall be opened and the and the generator locked out.

2) Off/Cooldown - When placed in this position, the generator shall be soft unloaded from the bus (when possible) and the engine start signal shall be removed after a defined cool-down period.

3) Automatic - When placed in this position, the engine control shall be in readiness for fully automatic operation upon receipt of a start signal.

4) Test Off-Line - When placed in this position, the engine shall start and run as if a start signal were received except the circuit breaker shall not be closed and it shall not be connected to the bus. If a start signal is received, normal automatic functions shall resume. When returned to the Automatic position, the engine shall shut down.

5) Test On-Line - When placed in this position, the engine shall start, run, and connect to the bus. When returned to the Automatic position the circuit breaker shall open, provided no automatic start signal is present, and the engine shall run for its cool-down period before shutting down.

6) The Engine Control Switch shall be hard wired so the operator can choose to start the engine manually via the Test On-Line position if desired. Systems which do not include this feature are not acceptable.

d. Four Position Synchronizing Mode Selector Switch

1) Permissive - In this position the governor controls are deactivated. However, the synchronizer shall operate as a passive synch check relay and signal the closing of the generator breaker when both sources are in phase.

2) Check - In this position the synchronizer is fully operational except it cannot close the generator breaker. The phase-lock feature holds the generator output in synchronism with the bus.

3) Off - In this position the synchronizer is turned off to allow for manual paralleling at the Master Cubicle.

4) Run - In this position the synchronizer is in the fully operational, automatic mode.

e. Engine Cooldown Time Delay

1) The cooldown time delay shall be adjustable from 1 to 10 minutes (factory set at 5 minutes) and automatically bypassed for malfunction and manual shutdown of the engine generator set.

f. Failure to Synchronize Time Delay

1) The failure to synchronize time delay shall be fixed at 60 seconds. It shall provide audible and visual indication, but it shall not terminate synchronizing attempts nor shut down the engine.

g. 1% Generator Analog Metering / Instrumentation

1) Ammeter 0 - 600 Ampere scale.

2) Voltmeter 0 – 5,000 Volt scale.

3) Kilowatt meter 0 - 4,000 Kilowatt scale.

4) Frequency meter 55 - 65 Hertz scale.

5) 4 Position Ammeter/Voltmeter selector switch shall be included.

h. Generator Control Station to include the following

1) 5 Position Engine Generator Control Switch with Lockout/Reset, Off/Cooldown, Automatic, Test Off Line and Test On Line Positions

2) 4 Position Synchronizing Mode Selector Switch with Permissive, Check, Off and Run Positions

3) Red Emergency Stop Pushbutton

4) Alarm Reset Pushbutton

5) 3 Position Voltage Control Switch with Lower, Off and Raise Positions

6) 3 Position Speed Control Switch with Lower, Off and Raise Positions

i. Alarm and Status Indication Panels with the following indications:

1) Lamp Test (Pushbutton)

2) Parallel CB Open* - Green

3) Parallel CB Closed* - Red

4) Parallel CB Lockout - Red

5) Parallel CB Fail to Close - Red
6) Failure to Sync - Red
7) Gen Output CB Open - Green
8) Gen Output CB Closed - Red
9) Parallel CB Not Connected - Red
10) Parallel CB Fail to Open - Red
11) Ground Fault Alarm - Red
12) Over Crank Shutdown - Red
13) Over Speed Shutdown - Red
14) Reverse Power Shutdown - Red
15) Low Oil Pressure Shutdown - Red
16) High Water Temp Shutdown -Red
17) Auto Start* - Green
18) ECS Reset Required - Red
19) Engine Control Not in Auto - Red
20) Low Oil Pressure Alarm - Amber
21) High Water Temp Alarm - Amber
22) Engine Running* - Green
23) PLC Stopped* - Red
24) Control Voltage Failure* - Red
25) Controls Not in Auto - Red
26) Local/Remote Emergency Stop - Red
27) Low Water Level Alarm - Amber
28) Low Water Temp Alarm - Amber
29) Powerquest Override - Amber
30) Day Tank Low Fuel - Amber
31) Day Tank High Fuel - Amber
32) Day Tank Rupture Basin - Amber
33) Battery Charger Failure - Red
34) High Battery Voltage - Amber
35) Low Battery Voltage - Amber
36) Gen Common Shutdown* - Red
37) Gen Common Alarm – Amber
38) Protective Relay Shutdown – Red
39) Protective Relay Common Alarm - Amber
40) DC Converter Failure - Red
41) DSLC-2 Self Test Failed - Red

* Includes hard wired backup if PLC is not available

2.7 SYSTEM MASTER CONTROL SECTION

A. The Master Control Section shall contain redundant programmable logic controllers capable of storing necessary control sequence algorithms, variable operation set-points, time delays and alarming levels. I/O shall include modular input and output cards for discrete and analog signals necessary to provide the integrated system operations specified below. Master PLCs shall be Modicon M580.

B. Priority Load Control

1. Discrete output modules shall be provided to control the necessary priority load blocks. The number of load blocks shall equal the number of engine generator sets and shall be sized such that the connectable load of each block is not greater than the kW rating of the generator set connected. As the generators are connected to the bus, the controller shall signal for the connection of the load blocks in an ascending sequential priority with the highest priority load requiring emergency power being connected first. Priority pass-along logic shall initiate the connection of low priority loads to the first generator on-line if start signals have not been received from higher priority transfer switches or other devices.
2. In the event of an engine failure system loads shall not be shed if remaining capacity can serve the connected load unless a bus overload or a bus under frequency occurs; this feature is referred to as “load-latch”.
3. If Load shedding is required it shall be done on a last-on, first-off basis. The generator bus shall have a solid-state frequency monitor, with integral time delay to initiate load shedding upon a reduction of bus frequency to 58 Hz or less, for a period of three seconds or more. Upon sensing a bus underfrequency, the system shall automatically shed the lowest priority load connected at the time of occurrence. This shed circuit shall override any manual load-add operation and shall lock out the manual load-add circuitry. It shall provide visual and audible alarm annunciation of bus underfrequency load shed.
4. Provide means to reset the bus underfrequency signal.
5. Provide a “load shed bypass/reset” push-button, for manual supervised operation over the load-shed, load-add control logic. One push-button shall be provided for each priority block except priority 1. Logic shall be provided if a bus overload occurs resulting in a reduction in bus frequency; the bypassed priority load shall be shed automatically through override logic control.

C. Power Management Features

1. Master Control features shall include Bus Load Optimization and Generator Load Demand. Applications shall dynamically adjust to bus conditions.
2. Bus Load Optimization shall control up to 128 individually prioritized and separately controlled distribution loads via power transfer switches and/or electrically operated circuit breakers. Loads shall be added or removed from the bus according to the available headroom on the bus. If a Priority Block of load has been shed or has not

been added to the bus while operating in the Emergency Mode, Load Bus Optimization is provided to re-add shed loads individually based on predetermined kW loading values up 95% (adjustable via OIT) of the capacity of the on-line power. Bus Optimization loading control determines if there is enough room to add the next load by checking the pre-set Load Value (field adjustable, accessible via the OIT) assigned to each shed load. If it is determined that the load can be added without exceeding the available headroom, the load is signaled to add.

a. The real time kW output of the generator bus is constantly measured, and the next sub-priority load is evaluated. Loads are evaluated at a preset time interval defined via the OIT. When the bus has been loaded to a level such that the next load will exceed the available headroom load adding will pause.

b. The system will continuously monitor the generator load and evaluate if the next load step can fit on the bus. If building load decreases and the next load can be added, the system will add it and continue the evaluation process until as many loads as possible are added to the bus.

1) With the Bus Optimization switch in the "on" position during emergency mode and with loads shed (loads requiring power but are not connected to the emergency bus), after a stabilization time delay the optimization feature is activated and a Bus Optimize Active light illuminates.
2) The Bus Optimize Active light flashes through the duration of the stabilization time delay (default 30 seconds, adjustable via OIT).
3) Bus Optimization loading control will determine if there is enough room to add the next load by checking the pre-set Load Value (field adjustable, accessible via the OIT) assigned to the first sub-priority within the highest priority block that is shed and compare it to the excess generator bus capacity.
4) If it is determined that the load can be added without exceeding the Bus Optimization KW loading value (95%), the load is signaled to add.
5) The real time kW output of the generator bus is constantly measured and the next subpriority load is evaluated.
6) Loads are evaluated at a preset time interval defined via the OIT
7) When the bus has been loaded to a level such that the next load would exceed the KW loading value (95%), the Next Load Exceeds Headroom light will activate and load adding will pause.
8) The system will continuously monitor the generator load and evaluate if the next load step can be added to the bus.
9) If building load decreases and the next load can be added (for the duration of the step time delay), the system will add it and continue the evaluation process until as many loads as possible are added to the bus.

3. Generator Load Demand controls the number of generator sets to remove excess generator capacity and add additional capacity when needed, keeping the optimum number of generators online at all times. Generator load demand saves fuel and wear by running fewer generators at a more efficient load level. Engine-generator

sets shall be added or removed from the bus according to dynamic measurements of power consumption and engine-generator efficiency set-points.

a. After all generator sets have been paralleled to the bus and all loads connected that require power, a stabilization time delay (0-300 seconds) factory set at 30 seconds will be initiated and the Load Demand Mode light flashes. At the expiration of the time delay period, the system will operate in load demand mode.

b. Load demand removes the lowest priority generators (priority value set at the OIT) that are in excess of N. When the system is operating with more generators online than the system requires and the system load falls below the drop out load value (default setting of 80% kW) a 20 second time delay (field adjustable from 0 - 300 seconds) is initiated and the "Gen Stop TD Active" light flashes. If the load stays below the dropout value for the duration of the time delay, the generators with the lowest priority will be taken offline. The engines will run for their cool down period, then shutdown. If the bus KW (system load), is equal to or greater than the generator load demand pickup value for the duration of the load demand start td (default 5 seconds), the controls will initiate the starting and paralleling of the next set in sequence. c. Run Time Based Load Demand feature –

1) Provide a run time based, automated load demand feature that automatically rotates generators to be removed from the bus when operating in load demand mode. Engines will be rotated based on actual engine run time.

D. Master Programmable Logic Controller

1. The master programmable logic controller shall be programmed by ASCO and shall meet or exceed the following specifications:

   a. Modicon M580 with CPU, power supply, I/O, and communications.

   b. The controller shall have the capability to interface to an I/O rack; I/O network shall be a managed ring configuration.

2. Master PLC Redundancy

   a. The system shall consist of identical and synchronized redundant programmable logic controllers and a common I/O system. Normally, the primary PLC shall be the active one that controls the system I/O while the secondary PLC shall be on standby, ready to take control of the system I/O. Any single failure to the active controller shall cause automatic switch over to the standby controller. As both controllers shall be synchronized, there shall be a transfer from one controller to the other without interruption. The I/O shall be held in their current state during the transfer.

   b. If the active controller fails and control transfers to the standby controller, the failed controller can be turned off and repaired without affecting the rest of the system.

   c. Status indicators shall indicate which controller is active and if a controller is in run or stop mode.

E. Manual Paralleling Controls

1. A Synchroscope selector switch shall be provided to select any generator for manual paralleling operation. The positioning of the selector switch shall simultaneously connect the synch-check relay, Synchroscope, and "manual paralleling" push-button to the selected generator.
2. A solid-state sync check relay shall be furnished for manual paralleling, to sense and compare the phase angle difference between the oncoming generator and the bus. This relay shall lockout the manual paralleling push-button until the oncoming generator is within 15 degrees of synchronism.
3. Operation shall be arranged so the operator shall depress and hold the manual paralleling pushbutton. When the relative phase angle reduces to 15 degrees and going towards zero degrees, the sync check relay's output contact shall initiate the closing of the respective oncoming generator breaker.
4. The manual paralleling interface controls and metering shall be grouped in a central location on the front of the master control section. This shall allow for paralleling multiple generators from one location within the switchgear. Manual paralleling controls and sync check relay shall be hardwired and shall not rely on touch screens or programmable logic controllers to perform manual paralleling functions. Systems that rely on touchscreens only for manual paralleling or that require manual paralleling to be initiated at the engine generator control panel are not acceptable.

F. DC Control Power Selector – Best Battery System

1. Control power for the system logic shall be derived from the engine starting batteries and/or an optional station battery system. The control logic shall be powered through a suitable means that shall permit continuity of power until the last battery is no longer available. The controls shall be powered from any battery or combination of batteries and prevent feedback to a failing battery. The transition of control logic power from any battery combination to any other battery combination shall be accomplished without disruption in the power flow.
2. DC-to-DC converters shall provide a constant 24VDC power to the Master and Generator controllers during starting and cranking of all engine generator sets "simultaneously". Dedicated DC to DC convertors shall be provided in each Generator Control Section and the Master Control Section.
3. The best battery system shall provide power to each generator paralleling circuit breaker trip coil if the generator battery power to its cubicle is lost.

G. System Test Switch

1. Provide a system no-load test switch to initiate a complete automatic system operation by simulating the closure of the remote engine start signal. This switch shall be mounted inside the master section to limit access to authorized personnel only.

H. Main Bus Monitoring

1. Main bus monitoring shall include discrete Bus Under/Overvoltage (Device 27/59) and Bus Under/Over-Frequency Relays (Device 81O/U) and a Main Bus Power Watt Transducer.

I. 1% Paralleling Bus Analog Metering / Instrumentation

1. Ammeter 0 - 3,000 A scale
2. (Qty 2) Voltmeters 0 – 5,000 V scale
3. Kilowatt Meter 0 - 15 kW scale
4. (Qty 2) Frequency Meters 55 - 65 Hz scale
5. Synchroscope
6. Synchroscope Plant Selector Switch with positions for each generator
7. 4 Position Ammeter/Voltmeter selector switches shall be included.

J. Alarm and Status Indication Panels with the following indications:

1. Lamp Test (Pushbutton)
2. Gen # Running (one for each Generator) - Green
3. Gen # Online (One for each Generator) - Red
4. Gen # Locked Out (One for each Generator) - Red
5. Pri # Load Shed Active (One for each Priority) - Amber
6. Pri # Load Shed Bypassed (One for each Priority) - Amber
7. System Test - Amber
8. Emergency Mode - Amber
9. I/O Comm Failure - Red
10. System PLC Diagnostic Fault - Amber
11. Load Demand Mode Active - Amber
12. Load Demand Start TD Active - Amber
13. Load Demand Stop TD Active - Amber
14. Bus Under Frequency - Red
15. Bus Over Frequency - Red
16. Bus Under Voltage - Red
17. Bus Over Voltage - Red
18. Bus Optimization Mode Active - Amber
19. Next Load Exceeds Headroom - Amber

20. Bus Loaded to Capacity - Amber
21. Bus Overload - Red
22. Station Battery Charger Failure - Amber
23. Main Tank Low Fuel - Amber
24. ATS Control Fuse Blown - Red
25. PLC 1 Stopped - Red
26. PLC 2 Stopped - Red
27. Control Voltage Failure - Red
28. Dc Converter Failure - Red

K. System Master Control Station to include the following:

1. Bus Alarm Reset Pushbutton
2. Alarm Silence Pushbutton – Red
3. Lighted Manual Parallel Pushbutton – Green
4. Load Shed Bypass Pushbuttons – 1 for each priority except priority 1

L. Main Audible Alarm

1. Provide a main audible alarm horn. The alarm horn shall be the DC vibration type, subsequent malfunctions will resound the alarm if the horn had been previously silenced following an initial malfunction.

2.8 SYSTEM OPERATOR INTERFACE TERMINAL

A. Provide monitoring and control operator SCADA with Modbus TCP/IP interface with Plant BMS .

B. Metering and monitoring network devices and design standards shall include IEC 62443-3, NERC CIP and IEEE 1613, providing a secure network with security management. Encrypted connections and configuration files shall provide data confidentiality with connection verification required for access. Simple general purpose security for industrial applications shall include IEC 62443-4-2 Level 1 and Level 2 for medium and high security options. The controls network shall remain isolated.

C. The monitoring and control interface shall include a programmable 24” color touch screen unit and shall interface with Programmable Logic Controllers, Synchronizer/Load Controllers, Power Meters, Circuit Breaker Trip Units and Transfer Switches. The automatic operation of the system shall not be impeded by the unavailability, disconnection or failure of any single or all color touchscreens.

D. The main default screen shall consist of a one-line overview of the system that includes:

1. Dynamically updated and color-coded (according to status) one-line representing power flow and sources, and emergency power system elements such as engine-

generator sets, circuit breakers included in scope of delivery (including breaker position and alarms), switchgear assemblies, and transfer switches (including transfer switch position, source availability, and bypass position if available).

2. Communication status of PLCs
3. Generators and transfer switches shall, when selected, link to a separate screen showing detailed status and alarm information ("drill down screens")
4. Main menu buttons, buttons linking to user guides, and buttons that link to other screens
5. ATS summary/configuration screen shall be accessible via menu button
6. Common alarm status including number of active alarms, number of unacknowledged alarms, and a flashing warning indicator if there are active alarms
7. The current KW value of all main and tie breakers
8. Color legend, abbreviation legend, and customer logo

E. Drill down screens shall include:

1. A dynamically updated mimic of the Master Status Panel.
2. Generator status panels shall mimic the actual switchgear panels including dynamically updated color indications and signal nomenclature.
3. Generator control stations shall mimic the actual switchgear control stations with fully functional engine control switch and synchronizing mode switch.
4. Metering screens shall include an image icon of the meters and dynamically updated parameters that are available from the meter (voltages, currents, power measurements)
5. Synchronizer/Load Share controller screens shall include a photographic image icon of the actual controller and dynamically updated parameters that are available from the controller such as metering status (voltages, currents, power measurements) and synchronization status (frequencies, voltages, synchroscope).
6. Transfer Switch drill down screens shall include details of selected transfer switches, if available, including present status and position, source availability, transfer/retransfer controls (password protected), bypass status, pickup/dropout settings, time delay settings, and metering data.

F. The monitoring and control interface screens shall also include:

1. A load management screen which shall dynamically indicate the current load demand status and provide operator controls to change settings (password protected). Each generator shall be represented and include "pick up" and "drop out" information and parameters (user-defined time delays, current timer status, and actual power) to manage loading of all engine-generator sets.

2. A bus optimization screen which shall dynamically indicate application status (enabled/disabled), most recent step load added, next available step load information, headroom, and priority load shed controls.
3. A generator priority screen for load demand.
4. A load priority screen for assigning unique priorities and tag names to each transfer switch and/or electrically operated circuit breaker for distribution loads. Parameters for each load shall include current power status and step add time delay. Transfer switches shall include (when available) engine start signal, load shed signal, and HOA (Hand-Off-Auto) mode.
5. An alarm summary screen with a current listing of all active alarms up to 500 entries and option for operator to acknowledge alarms (password protected)
6. An alarm history screen with up to 500 entries and a button linking to folder containing archive of 3 months or longer.
7. A communication status screen with network connections color-coded and dynamically updated.
8. Historical trending of up to 10 parameters (phase currents; average current; average line-to-line voltage; total apparent, real, and reactive power; frequency; power factor) for 3 months or longer. Buttons shall be provided to zoom in and out as well as recall historical data and fast forward up to the current time. Plots shall display up to 8 curves concurrently.

G. Security features shall include at least three distinct security levels (monitor, control, manage) and a unique user name and password for each individual. Each individual account shall also be assigned to a security level thereby defining the scope of their access and control. Logging into or out of the system shall be an event entered into the alarm history. Each operator-triggered alarm shall be logged as an alarm history entry with the operator identity included. If an individual is logged in to the system with no activity for 30 minutes, the individual shall be automatically logged out.

H. On loss of screen communication, the operator must be able to take control at any time; systems that utilize “instant auto” features shall be excluded.

Screens shall be turned off (power standby mode) after 30 minutes of inactivity to protect the LCD monitor; a single touch of the screen shall turn the screen back on.

2.9 DISTRIBUTION SECTIONS

A. Distribution sections shall be provided with number and size of distribution circuit breakers as shown on the project drawings.

B. One High Feeder Breaker Sections **s**hall be provided as shown on the drawings and shall contain the following components

1. (Qty 1) 3,000A Square D type VR vacuum circuit breaker with Auxiliary Contacts, MOC and TOC Switches
2. (Qty 3) Current transformers for metering and relays, ratio as shown on drawings
3. Circuit Breaker Control Switch with open/closed/tripped LEDs
4. Schneider Electric Easergy P3F30 or equivalent Feeder Protective Relay with overcurrent protection and test blocks
5. Device 86 Lockout Relay

C. One High Feeder Breaker and Main Bus PT Section shall be provided as shown on the drawings and shall contain the following components

1. (Qty 1) 3,000A Square D type VR vacuum circuit breaker with Auxiliary Contacts, MOC and TOC Switches
2. (Qty 3) Current transformers for metering and relays, ratio as shown on drawings
3. Main Bus Drawout type Potential Transformers, 2 Delta Connected ratio as shown on the drawings
4. Circuit Breaker Control Switch with open/closed/tripped LEDs
5. Schneider Electric Easergy P3F30 or equivalent Feeder Protective Relay with overcurrent protection and test blocks
6. Device 86 Lockout Relay

D. Provide circuit breaker control switches for all circuit breakers. Control switches shall have built in LED indicating lights to indicate breaker status (open, closed, tripped). Manually opening the circuit breaker via circuit breaker control switch shall inhibit automatic operation and shall be annunciated on the one-line screen.

E. Distribution sections shall be provided with main bus of the same ampacity as the generator switchgear sections.

F. Prepared spaces shall be completely assembled included circuit breaker cradles/cells with complete provisions for addition of future Circuit Breakers

2.10 TIE BREAKER AND CONTROL SECTION

A. Tie Circuit Breaker: Each Tie section shall contain over-current protection, controls, relays and auxiliary devices associated with its respective utility source. It shall include the following:

1. For each tie breaker, a medium voltage Square D type VR vacuum circuit breaker shall be furnished. Circuit breakers shall be rated 4,160 nominal volts, 4,760 maximum volts, 60 Hz, with a continuous current rating of 3,000 amps and a maximum symmetrical interrupting rating of a maximum symmetrical interrupting rating of 50kA - 4.76 kV system.
2. Furnish circuit breakers with one vacuum interrupter per phase. Breakers of same type and rating shall be completely interchangeable. The circuit breaker shall be operated by means

of a stored energy mechanism which is normally charged by a universal motor but can also be charged by the manual handle supplied on each breaker for manual emergency closing or testing. The closing speed of the moving contacts is to be independent of both the control voltage and the operator. Provide a full front shield on the breaker. A minimum of 6 auxiliary contacts and 5 MOC and 5 TOC type contacts, shall be provided for external use. The racking mechanism to move the breaker between positions shall be operable with the front door closed and position indication shall be visible with door closed.

3. Bus Mounted Drawout type Potential Transformers, 2 Delta Connected ratio as shown on the drawings.

4. An interlocking system shall be provided to prevent racking a closed circuit breaker to or from any position. An additional interlock shall automatically discharge the stored-energy operating mechanism springs upon removal of the breaker out of the compartment.

5. The circuit breaker control voltage shall be 48 volts DC. Close and trip control power shall be independently monitored. Breaker closure shall be inhibited if trip power is unavailable.

6. A Circuit Breaker Trip Switch shall be provided with open/closed/tripped indicating LEDs

B. Tie Control System:

1. Paralleling controls for each tie shall include a Woodward MSLC-2 master synchronizer and load controller designed to communicate with the generators DSLC-2 and mounted in the switchgear. The controls shall combine Generator bus phase and voltage matching sync, utility load sensor, import/export load level control, system power factor control, and master process control.

2. Tie Section Protective Relaying and Monitoring

a. A Schneider Electric Easergy P3F30 or equivalent management relay shall be provided to provide complete protection and monitoring functions.

b. Bus Differential Protection- Provide Easergy MiCOM P723 (relay)+ P793 (resistor box) for bus differential protection for both bus segments.

2.11CONTROL OF EXISTING UTILITY SWITCHGEAR

A. Switchgear manufacturer to provide I/O as needed to control and monitor the existing utility 5kV switchgear. PLC interface for (3) Utility Mains, (3) Ties, (2) Gen Mains, & (11) Distribution breakers will be located in the Master section. The existing PG breaker will be converted to a spare distribution breaker.

B. Contractor to coordinate with manufacturer of existing switchgear for any modifications needed for interface to new PLC system and assistance with commissioning.

2.12 POWER METERING

A. Provide power meters as follows:

1. Generator Sections: Provide a power quality metering device at each Generator as follows:

a. Provide the following specified product and manufacturer without exception: PowerLogic [PM8244 Meter] by Schneider Electric.

2. Feeder Circuit Breakers: Provide a power metering device at each Distribution Circuit Breaker as follows:

    a. Provide the following specified product and manufacturer without exception: Powerlogic [PM5580 Meter] by Schneider Electric.

2.13 SWITCHGEAR STATION BATTERY SYSTEM

A. The Paralleling Switchgear Manufacturer shall provide a 48-volt DC power system for the electrical equipment as indicated on the Drawings and specified herein. Battery shall be sized to simultaneously energize all the switchgear spring charge motors plus the continuous loads on the switchgear requiring DC power. Battery shall be sized for an 8 hour backup period with simultaneous tripping of 4 circuit breakers at the end.

B. System Requirements: Battery shall have number of cells and ampere-hour capacity based on an initial specific gravity of 1.30 at 25 deg C. Size battery using a 1.0 Design Margin and 1.25 Factor for aging. Back up time is 8 hours to include tripping x number of breaker at the end of the 8 hour period, to an end voltage of 1.75 volts/cell. BAE Battery Model OPzV or equal.

1. Battery: Positive electrode Tubular - plate with a polyester gauntlet and solid grids in a corrosion-resistant PbCaSn – alloy.
2. Negative electrode Grid - plate in a PbCaSn alloy with long - life expander material Separation Microporous separator.
3. Electrolyte Sulphuric acid with a density of 1.24 kg/l, fixed as a GEL by fumed silica Container and lid High impact SAN (Styrol-Acrylic-Nitrile), grey coloured, UL-94 rating: HB
4. Valve with flame arrestor, opening pressure approx. 120 mbar, closing pressure approx. 50 mbar
5. Inter-tier connectors Flexible insulated copper cables
6. Connector screw M10 stainless steel with insulated cap
7. System batteries shall be suitable for service at an ambient temperature ranging from minus 18 to 25 deg

C.

C. Rack: Two-tier or step rack depending on space available with electrical connections between battery cells and between rows of cells. Rate rack, cell supports, and anchorage for seismic requirements.

D. Accessories:

1. Thermometers with specific-gravity correction scales.
2. Set of cell numerals.
3. Cell terminal covers
4. Eyewash Station

E. Charger: Static-type Microprocessor Controlled SCR rectifier, Model AT Series as by BAE or equal and equipped with automatic regulation and provision for manual and automatic adjustment of charging rate. Unit shall automatically maintain output voltage within 0.5 percent from no load to rated charger output current, with ac input-voltage variation of plus or minus 10 percent and input-frequency variation of plus or minus 3 Hz. Other features of charger include the following:

1. DC ammeter.
2. DC Voltmeter: Maximum error of 5 percent at full-charge voltage; operates with toggle switch to select between battery and charger voltages.
3. Ground Indication: Two appropriately labeled lights to indicate circuit ground, connected in series between negative and positive terminals.
4. Capacity: Sufficient to supply steady load, float-charge battery between 2.20 and 2.25 V per cell and equalizing charge at 2.33 V per cell. Recharge a discharged battery in 8 hours.
5. Charging-Rate Switch: Manually operated switch provides for transferring to higher charging rate. Charger operates automatically after switch operation until manually reset.
6. AC power supply is 120 V, 60 Hz, subject to plus or minus 10 percent variation in voltage and plus or minus 3-Hz variation in frequency. After loss of ac power supply for any interval, charger automatically resumes charging battery. Charger regulates rate of charge to prevent damage due to overload and to prevent fuses or circuit breakers from opening.
7. Protective Feature: Current-limiting device or circuit, which limits output current to rating of charger but does not disconnect charger from either battery or ac supply; to protect charger from damage due to overload, including short circuit on output terminals.
8. Electrical Filtering: Reduces charger's audible noise to less than 26 dB.
9. Charger shall include a feature for one (1) Summary Alarm contact on the Main Control PC Board with separate pc board with discreet two (2) form-C relay contacts for all six (6) alarms. Include option for MODBUS communications.

F. Spill Containment shall be provided for neutralization of any acid, Enviroguard approved system.

2.14 SEQUENCE OF OPERATION

A. Summary:

1. This Power Control System is designed to operate as a standby emergency system when a start signal is received indicating that a utility failure has been sensed at the utility mains.
2. System Rating is 4,160V, 3P3W. This system is set up for 4 generators. Generators are rated 4,160V, 3P3W and 3,000kW.
3. The emergency bus is a dual bus configuration with a normally open tie breaker. This configuration is in place to help ensure that both bus segments get at least one generator online in the quickest manner possible. With the tie breaker open, the two bus segments will operate as independent generator plants with (2) generators on plant A and (2) generators on plant B. Controls shall ensure the tiebreakers on the utility but are opened to isolate the generators.

4. Upon a failure of a generator, there is an automatic synchronizer across the tie breaker that can synchronize and connect the two bus segments together so that building load can be shared proportionally between the remaining generators on the two bus segments. With the tie breaker closed, the system will operate as a single generator plant with (2-3) generators.
5. Load is distributed via (2) normally closed feeder breakers to the utility switchgear. The distribution breakers of the utility switchgear will be closed only when emergency power is available and they will be closed based on available capacity, priority and time delay settings. Load shed is accomplished via the utility feeder breakers.

B. Normal Mode:

1. Whenever the individual engine generator control switches are placed in their automatic position, the engine generator system is on standby in readiness for automatic starting and synchronization in the event of a power failure signal.
2. Normal/Automatic position of all control switches listed below (Note: switches not shown may be in any position.):
3. Generator Control Station:
   a. Engine Control Switch: Auto
   b. Sync Mode Switch: Run
   c. Emergency Stop: Out (Not Active)
4. Normal State of switchgear circuit breakers listed below:

Tie between A&B:	**Bus A:**	**Bus B:**
52T – Open	52G1 – Open 52G2 – Open 52FA – Closed	52G3 – Open 52G4 – Open 52FB – Closed

C. Emergency Mode:

1. Any time a Utility outage is sensed and/or Generators are called to start in anticipation of feeding building load, the system will annunciate this condition as Emergency mode. PLC issue auto start signals upon sensing Utility failure at the Utility Main protective relays. Regardless of the bus the utility main is associated with, all generators will be started.
   a. All generator(s) automatically start and come up to speed.
   b. The first generator set on each side of the tie breaker to achieve 90% of nominal voltage and a frequency above 59Hz shall be connected to the bus.
   c. Note: Electronic interlocks permit the connection of only one engine generator to the dead generator bus in the event of simultaneous generator relay operation. However, with the tie breaker open there are two dead busses and independent dead bus closures will be permitted, one for each bus.
   d. After a bus is energized by one generator, the synchronizers for the remaining generators associated with that bus will automatically adjust the frequency of the next on-coming generator to synchronize with the bus.

e. When synchronism is achieved, the on-coming generator is paralleled to the bus.

f. The generators connected to Bus A will all share load and VARs proportionally on Bus A.

g. The generators connected to Bus B will all share load and VARs proportionally on Bus B.

2. Possible Failure Modes:

a. Loss of a Generator or failure to start/connect a Generator:

1) On an engine failure, an independent time delay will start to allow the buss(es) to stabilize before synchronizing across the tie breaker. Once the Bus Stabilization TD expires (adjustable 10-300 seconds) the Master Synchronizer will synchronize Bus B to Bus A.

2) With Bus A and Bus B in synch, the tie breaker will be closed.

3) With the tie breaker closed, the remaining generators connected on both sides of the bus (A&B) will all share load and VARs proportionally.

b. Generator Fail To Sync: the condition will be annunciated. The generator will be allowed to continue running. Synchronization attempts will continue as long as the generator is running.

c. 52G# Fail To Close: the condition will be annunciated the affected generator will be shutdown. The condition may be reset at any time via the lockout/reset position of the engine control switch.

d. Bus Fail To Sync: the condition will be annunciated. Synchronization across the tie breaker will be aborted and inhibited until the condition is reset. Condition may be reset at any time.

e. 52T Fail To Close: the condition will be annunciated attempts to automatically close the tie breaker will be inhibited while the condition is active. The Tie Master Synchronizer will be disabled while the condition is active as well. Condition may be reset at any time.

f. Only one bus energized: If for some reason only one bus (A or B but not both) is energized when the bus stabilization TD expires, the MSLC will permit a dead bus closure across the tie. Note: electronic interlocks between the MSLC and the DSLCs permit the connection of only one source to the dead bus. Once the tie is closed, any remaining generators not online will be allowed to synchronize and parallel to the bus. If a Bus Under frequency occurs with only one generator online, the tie breaker will be tripped open and inhibited from closing.

g. DSLC failure: If the DSLC fails, the condition will be annunciated and the affected generator will be shutdown. The remaining DSLCs will recognize that the unit is offline and reconfigure the network so that the remaining units can come online and share load.

h. Master Synchronizer (MSLC) failure: If the MSLC fails, the condition will be annunciated and paralleling across the tie breaker will be unavailable. Generators

(DSLCs) will be unaffected by this condition. The tie breaker may be manually closed via the circuit breaker control switch (if available) provided only one side of the bus is energized and the other side of the bus is deenergized.

i. Load Sharing network failure (LAN A or LAN B): Load sharing is done via two Ethernet LANs. If a single LAN fails, the condition will be annunciated but the system will maintain full functionality via the redundant LAN. A dual LAN failure will be annunciated, but load sharing will not be functional. Caution: a dual LAN failure is a serious condition; on a dual LAN failure only one generator should be left in automatic mode and manual intervention is required to ensure that the generators are not paralleled.

3. Block Load Control: Loads are grouped into Priority blocks, one for each generator. Each load has an adjustable priority setting, estimated KW value and step time delay associated with it. The aggregate sum of kW within the block should be less than the rating of the smallest generator.

   a. Transfer to Emergency

      1) When the first generator is connected to bus A, all Priority 1 loads on Bus A will begin their step time delay.

      2) When the load step time delay is complete (or if the time delay is set to zero), the feeder breaker associated with the load will immediately receive a close signal connecting any downstream devices to emergency power.

      3) When the first generator is connected to bus B, all Priority 1 loads on Bus B will begin their step time delay.

      4) When the load step time delay is complete (or if the time delay is set to zero), the feeder breaker associated with the load will immediately receive a close signal connecting any downstream devices to emergency power.

      5) As soon as the second generator is connected to the bus A, all of the Priority 2 loads on bus A will begin their step time delay.

      6) When the load step time delay is complete (or if the time delay is set to zero), the feeder breaker associated with the load will immediately receive a close signal connecting any downstream devices to emergency power.

      7) As soon as the second generator is connected to the bus B, all of the Priority 2 loads on bus B will begin their step time delay.

      8) When the load step time delay is complete (or if the time delay is set to zero), the feeder breaker associated with the load will immediately receive a close signal connecting any downstream devices to emergency power.

      9) Possible Failure Modes:

         a) Generator Failure: If a generator fails while operating in the automatic mode, it is disconnected from the bus and shutdown. Audible and visual alarms will be activated to indicate the condition. System loads will not shed unless a bus overload or a bus under frequency occurs. This feature is referred to as “Load-Latch”.

b) Bus Overload on Bus A: If the online load exceeds 105% of rated generator capacity on bus A, the condition will be annunciated and unsupported loads (loads in priority blocks greater than the number of generators online) will be step shed in reverse priority at one second intervals on bus A only. No loads in priority blocks equal to or less than the number of generators online will be shed. (Ex. If you have two generators online, load blocks 1 and 2 will stay online, priority 3 and above will be shed). A common Bus Overload light will be lit to indicate that one of the busses (A or B) is overloaded and automatically reset as the overload is corrected. Individual annunciation indicating which bus or busses experienced the overload will be indicated in the event log on the OIT. When the online load no longer exceeds 105% of the generator capacity, step shedding will cease, and the system will continue to power the loads that are left online.

c) Bus Overload on Bus B: If the online load exceeds 105% of rated generator capacity on bus B, the condition will be annunciated and unsupported loads (loads in priority blocks greater than the number of generators online) will be step shed in reverse priority at one second intervals on bus B only. No loads in priority blocks equal to or less than the number of generators online will be shed. (Ex. If you have two generators online, load blocks 1 and 2 will stay online, priority 3 and above will be shed). A common Bus Overload light will be lit to indicate that one of the busses (A or B) is overloaded and automatically reset as the overload is corrected. Individual annunciation indicating which bus or busses experienced the overload will be indicated in the event log on the OIT. When the online load no longer exceeds 105% of the generator capacity, step shedding will cease, and the system will continue to power the loads that are left online.

d) Bus Under frequency on Bus A: When a bus under frequency on bus A is detected a dedicated time delay (hard coded at 3 seconds) will start timing out. After the time delay expires, blocks of loads on bus A only will be shed automatically such that the remaining load blocks shall be one less than the number of generators remaining on bus A. (Ex. If you have two generators online, only load block 1 will stay online, priority 2 and above will be shed). The condition will be annunciated via a light on the status panel indicating the condition for either or both bus A and bus B. Individual annunciation indicating which bus or busses experienced the under frequency will be indicated in the event log on the OIT. Bus under frequency is a latched condition that must be manually reset and can only be reset after the condition has been alleviated. Note: priority 1 loads will never be automatically shed.

e) Severe Bus Under frequency on Bus A: When a bus under frequency is detected a second time delay (hard coded at 5 seconds) will start timing out. After the time delay expires, blocks of load on Bus A only will be

shed automatically such that only the Priority 1 load block will be remaining. Severe Bus under frequency is a latched condition that must be manually reset and can only be reset after the condition has been alleviated. There is only one status tile provided for Bus Under frequency annunciation, but the OIT will display if a Severe Bus Under frequency shed condition has been activated as well as which Bus has been affected by the condition. Note: priority 1 loads will never be automatically shed.

f) Bus Under frequency on Bus B: When a bus under frequency on bus A is detected a dedicated time delay (hard coded at 3 seconds) will start timing out. After the time delay expires, blocks of loads on bus B only will be shed automatically such that the remaining load blocks shall be one less than the number of generators remaining on bus B. (Ex. If you have two generators online, only load block 1 will stay online, priority 2 and above will be shed). The condition will be annunciated via a light on the status panel indicating the condition for either or both bus A and bus B. Individual annunciation indicating which bus or busses experienced the under frequency will be indicated in the event log on the OIT. Bus under frequency is a latched condition that must be manually reset and can only be reset after the condition has been alleviated. Note: priority 1 loads will never be automatically shed.

g) Severe Bus Under frequency on Bus B: When a bus under frequency is detected a second time delay (hard coded at 5 seconds) will start timing out. After the time delay expires, blocks of load on Bus B only will be shed automatically such that only the Priority 1 load block will be remaining. Severe Bus under frequency is a latched condition that must be manually reset and can only be reset after the condition has been alleviated. There is only one status tile provided for Bus Under frequency annunciation, but the OIT will display if a Severe Bus Under frequency shed condition has been activated as well as which Bus has been affected by the condition. Note: priority 1 loads will never be automatically shed.

h) Load Shed annunciation: Indicating lights will annunciate the status of each Priority load block, indicating if any loads in that block are shed on any of the busses (A or B). Individual Load Shed annunciation for each bus is available in the OIT. Re-transfer to Normal

10) Re-transfer to Normal

a) Upon sensing that normal utility power has been restored to acceptable limits, a sequence shall begin to transfer the load back to the utility source.

b) The re-transfer shall be initiated after the retransfer to utility time delay has expired allowing an open transition transfer return to utility.

c) After all the breakers on both busses have re-transferred their loads to the normal source, the generator circuit breakers are simultaneously

opened and the engine generators run for an adjustable no-load cool-down period of zero to thirty minutes; factory set at 5-minutes.

d) Possible Failure Modes:

e) Emergency source failure with Utility available: If the emergency source becomes unavailable with a good utility present, the re-transfer to utility time delay will be bypassed and the load will transfer to utility immediately.

D. Manual Mode

1. Generator Control Station Operation

   a. Test Offline – Starts Generator but does not sync or close paralleling breaker

   b. Test Online – Starts generator, permits automatic dead bus closure or synchronizes it to the bus if necessary, and connects it to the emergency bus via the paralleling breaker.

2. Manual Parallel

   a. The system includes a Manual Paralleling feature for paralleling the generator plants (A & B) across the bus tie. This mode would be necessary only if the automatic means of synchronizing across the bus tie is not functioning properly.

   b. The Master Synchronizer Mode should be turned to “Manual” on the OIT. This disables the automatic Raise/Lower speed and voltage set points that are sent to the DSLC from the Master Synchronizer (MSLC).

   c. The Bus Tie should be selected on the Plant Selector Switch on the Master Control section door.

   d. When Generator plant B is out of phase with Generator Plant A, the Synch-scope`s indicator will be outside the approximate 11-To-1 o'clock window.

   e. When the voltage phase differential is less than +/-15o electrical degrees; the Synch-scope indicating voltage phase within the window; the Manual Parallel Push-button will not be illuminated.

      1) Note: the sync check relay for the manual parallel circuit will permit dead bus closure onto plant A but not plant B. However the Tie Circuit Breaker Control Switch (CBCS) will permit dead bus closure on either plant A or plant B; the CBCS should be used for dead bus closure on the tie breaker.

   f. The voltage and frequency on Plant B is adjustable via the soft switches on the OIT.

   g. If Generator Plant B frequency is greater than the Plant A frequency, the Synch-scope indicator will rotate in the Fast direction.

   h. If Plant B frequency is less than the Plant A frequency, the Synch-scope indicator will rotate in the Slow direction.

1) Note: Optimum conditions for manual paralleling across the tie breaker would be to have the bus with the lower load level operating at a slightly faster frequency than the other Bus.

i. When the Synchroscope and Manual Parallel light indicate that the Generator plants are in phase with each other, the Manual Parallel push-button should be pushed.

3. The push-button allows the Sync. Check device (25C) to close the Bus Tie Breaker. Neither the pushbutton nor the Sync. Check device can individually close the Bus Tie breaker.

E. Failure Scenarios

1. Fail To Close (FTC): for all controlled breaker closures, 4 close attempts (2 seconds on, 2 seconds off) will be issued before the breaker fail to close condition is annunciated.

2. Fail To Open (FTO): for all controlled breaker trips, 1 trip attempt of adjustable duration will be issued and the breaker fail to open condition will be annunciated if the breaker is not opened before the time delay expires.

3. Feeder Breaker (52F#) Failure to Close (Note: for Feeder breaker load control only.)

   a. If a feeder breaker fails to close, that feeder will not be available for the system.

      1) The condition will be annunciated with an audible and visual indicator (i.e. Circuit Breaker Summary Alarm light and FTC by the affected breaker on the One-line).

4. Feeder Breaker (52F#) Failure to Open (Note: for Feeder breaker load control only.)

   a. The PLC will monitor the breaker position and if the Feeder breaker has not opened within 2 seconds after a trip command is issued, the condition will be annunciated (visually and audibly) and a relay signal will be issued.

   b. The feeder will remain closed and all attempts to open the feeder via the System controller will be aborted. All other Sequences will be allowed to continue unabated.

      1) The condition will be annunciated with an audible and visual indicator (i.e. Circuit Breaker Summary Alarm light and FTO by the affected breaker on the One-line).

5. Gen Paralleling Breaker (52G#) Failure to Close

   a. If a generator breaker fails to close, that generator will not be available for the system.

      1) The condition will be annunciated with an audible and visual indicator (i.e. Circuit Breaker Summary Alarm light and FTC by the affected breaker on the One-line).

6. Gen Paralleling Breaker (52G#) Failure to Open

   a. The PLC will monitor the breaker position and if the paralleling breaker has not opened within 2 seconds after a trip command is issued, the condition will be annunciated (visually and audibly) and a relay signal will be issued

   b. As long as the generator remains connected to the bus it cannot be shutdown.

c. Once removed from the bus, the affected generator will be shutdown.

d. The operator shall then place the generator into Lockout/Reset and rack out/service the failed breaker.

1) The condition will be annunciated with an audible and visual indicator (i.e. Circuit Breaker Summary Alarm light and FTO by the affected breaker on the One-line).

7. Lockout of Generator Paralleling Breaker (52G#)

a. If a Generator breaker trips on a Device 86 lockout, the breaker will open and the start signal to the affected generator will be removed immediately.

b. The condition will be annunciated with an audible and visual indicator (i.e. Circuit Breaker Summary Alarm light and on the One-line).

c. Reset of Lockout condition on a Generator Paralleling breaker

1) Once the condition has been repaired, it must be reset in basically the order the lockout occurred.

a) Any protective relay that issued a fault must be reset.

b) The Device 86 Lockout relay must be reset.

c) The last step would be to put the engine control switch in the lockout reset position and then back into Auto.

8. Lockout of Feeder Breaker (52F#)

a. If a breaker trips on a Device 86 lockout, the breaker will open and be inhibited from closing.

b. The condition will be annunciated with an audible and visual indicator (i.e. Circuit Breaker Summary Alarm light and on the One-line).

c. Reset of 52F# Lockout condition

1) Once the condition has been repaired, it must be reset in basically the order the lockout occurred.

a) Any protective relay that issued a fault must be reset.

b) The Device 86 Lockout relay must be reset.

c) The last step would be to press the "Bus Alarm Reset" button at the Master Control Station.

9. PLC Failure

a. System PLC Redundancy (Pair)

1) The master system controller consists of two PLC's: System PLC-1 and System PLC-2 are in the Master Section.

2) Any one of the 2 system PLC's is capable of operating the entire system and being the active controller. The active controller will be annunciated on the OIT. If the active PLC is functioning properly, it shall control all of the Master system functions: Load Adding, Load Shedding, Master system alarms, OIT entry, System Test, etc. The other PLC will be in a standby running condition.

It performs all of the logic the same as the active PLC with the exception that it will not control any of the output functions (i.e. lights, breaker operations, load control operations, etc.).

3) If the active PLC fails, there will be a seamless transfer of output control to the next PLC in the sequence. If the failed PLC is repaired and returned to service, it will operate in the standby running condition as described above. These conditions will be annunciated with audible and visual indicators.

4) The operator has the ability to select the PLC in control via the OIT. When PLC-2 is in control and PLC-1 is returned to service, the operator may manually transfer control back to PLC-1 via the OIT if so desired.

5) Total System PLC Failure

a) In the event that all of the System PLC's fail, control of the switchgear will revert to Manual control and all 30B relays will be de-energized (effectively shedding all sheddable ATSs). Bus optimization, automatic load add/shed and load demand will be disabled.

b) Generator PLC's are separate from the System PLC's, so full control of the generators will still be functional.

c) In the event of a Utility outage, generators can still be started automatically with a hardwired start signal from the ATS's. ATS's without the Acc. 30B will be allowed to transfer, but all other ATS's will be shed. All System breaker operation will be via manual control only.
10. Generator PLC (Hardwired backup circuit)

a. There is no generator PLC redundancy, but the DSLC for each generator is hardwired to function even if the generator PLC is failed. The Generator PLC is used for annunciation and auxiliary features only. While normal automatic operation is still available with a failed generator PLC, the following features will be lost:

b. Engine cool down timer.

1)Note: cool down timer will still be available at the engine controller if provided.

c. All Engine Malfunction annunciations, except "Common Shutdown".

PART 3 - EXECUTION

3.1 GENERAL

A. Examine equipment exterior and interior prior to installation. Report any damage and do not install any equipment that is structurally, moisture, or mildew damaged.

B. Pre-Installation Conference: Prior to commencing the installation, an onsite pre-installation conference shall review the material selections, installation procedures, and coordination with other trades. Attendees shall include, but shall not be limited to, the Contractor, the Installer, manufacturer's representatives, and any trade that requires coordination with the work. Date and time of the pre-installation conference shall be acceptable to the Owner and the Engineer

C. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the Installing Contractor.

D. Contractor shall Provide final protection and maintain conditions in a manner acceptable to the manufacturer that shall help ensure that the equipment is without damage at time of Substantial Completion.

E. Power System Study and Relay Settings:

1. The contractor shall provide power system study & relay settings from a 3rd party.

3.2 FACTORY ACCEPTANCE TESTING

A. An inspection and witness test of the switchgear prior to shipment shall be scheduled in advance with the factory.

B. The factory acceptance shall include the following:

1. Mechanical Inspection with equipment deenergized
2. Complete sequence of operation testing

3.3 INSTALLATION ASSISTANCE

A. The manufacturer of the generator control switchgear shall provide the services of a factory-employed and factory-trained technician to provide installation assistance.

B. It shall be the responsibility of the installing contractor to verify that the following items have been completed per applicable codes and standards, and are ready to perform as specified before the arrival of the factory technician

1. Inspect for obvious shipping damage.
2. The switchgear is properly installed, anchored and grounded.
3. Shipping splits have been reinstalled with the splits bolted together, interconnect wiring installed, and bus splice plates installed.
4. Terminate all power cables.
5. Install customer control wiring to external equipment including engines, batteries, building management systems, associated motor control, etc.
6. The engine generator set is installed and ready to run.
7. Associated motor controls, plumbing, building utilities are complete and operational.

C. It shall be the responsibility of the Field Service Technician to perform the following:

1. Verify contractor connections and control power availability.
2. With the engine generator supplier's technical representative controlling the engines, verify that the switchgear and control equipment are fully operational, and perform per the sequence of operation specified. Test equipment and services as required for the engine generator sets shall be provided by the engine generator set supplier.

3. With the engine generator supplier's technical representative controlling the engines, demonstrate all functions of the control system, both automatic and manual, to the satisfaction of the owner or representative.
4. Provide plant operators with instruction on the plant operating procedures and major component maintenance after acceptance by the owner's representative.

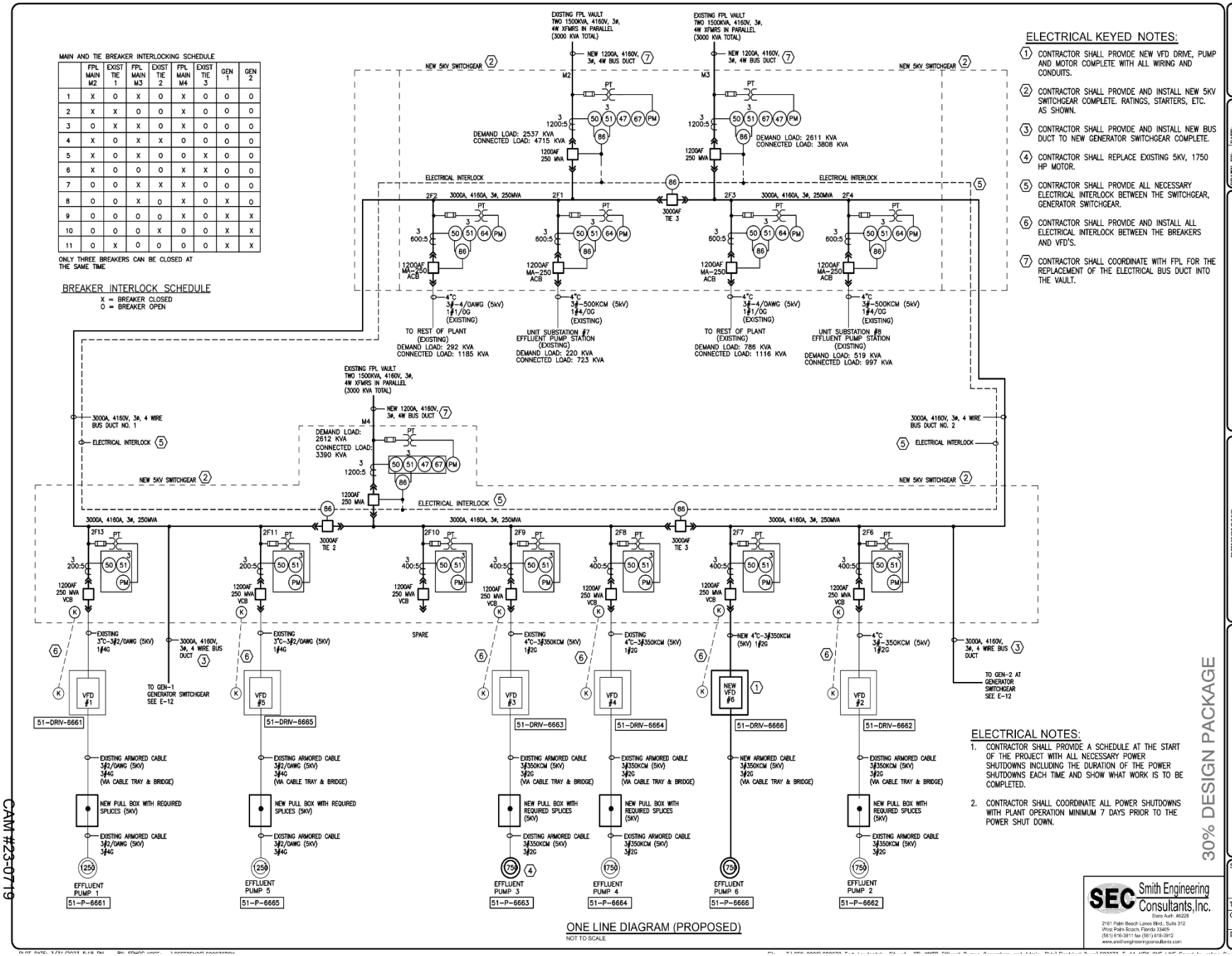
3.4 TRAINING

A. Onsite training specific to the equipment furnished shall be provided to the Owner's staff by a factory trained manufacturer's representative. Training duration shall be sufficiently adequate to cover the operation and maintenance of the equipment and shall consist of not less than 1 session(s) with 4 hours of onsite classroom and hands-on instruction for a minimum of 4 attendees per session.
    1. The instructor shall provide sufficient time and detail in each session to cover the following as a minimum:
        a. Sequence of operation
        b. Major components of equipment
        c. Operation of equipment
        d. Configurations of equipment
        e. Maintenance, troubleshooting and repair

3.5 PREVENTIVE MAINTENANCE PROPOSAL

A. The emergency switchgear Manufacturer/Supplier shall provide a 5-year preventive maintenance proposalin the bid. The maintenance proposal shall include all maintenance and offline testing of the paralleling switchgear for the complete generator system operation including generator controls, MV breakers, battery station and charger and any other components of the system deemed to be suitable for coverage under this maintenance.

END OF SECTION



LARRY M. SMITH, P.E. NO. 40599 SEAL

DRAWN BY: FR | DATE: 05/24/23
DESIGNED BY: FR/SH | SCALE:
CHECKED BY: LMS | FIELD BOOK:

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

REVISIONS

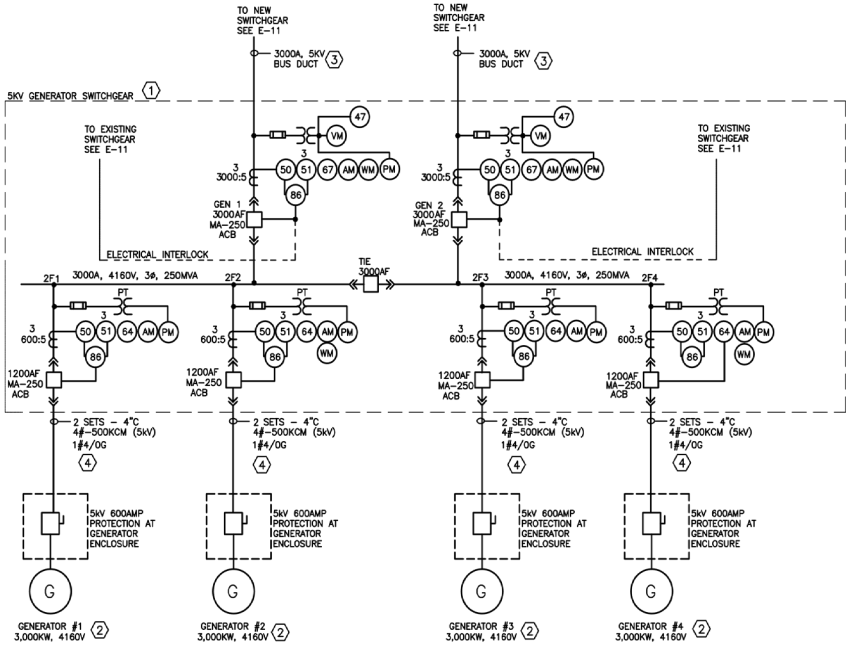
NO.	DATE	BY	CHK'D	DESCRIPTION

PROJECT # P12529
GTL WWTP EFFUENT PUMPS
GENERATOR & ADMIN BLDG. UPGRADES
NEW ONE LINE DIAGRAM

SHEET NO. E-11 OF
TOTAL:
CAD FILE:
DRAWING FILE NO.

SEC Smith Engineering Consultants, Inc.
State Auth. #6228
2181 Palm Beach Lakes Blvd., Suite 312
West Palm Beach, Florida 33409
(561) 816-3911 fax (561) 816-3912
www.smithengineeringconsultants.com

CAM #23-0719
Exhibit 1
Page 55 of 64



GENERATOR ONE LINE DIAGRAM

NOT TO SCALE

ELECTRICAL KEYED NOTES:

1. CONTRACTOR SHALL INSTALL NEW OWNER FURNISHED GENERATOR SWITCHGEAR COMPLETE. CONTRACTOR SHALL ACCEPT THE SWITCHGEAR AT DELIVERY AND STORE OFF SITE UNTIL INSTALLATION. INCLUDE ALL NECESSARY TRANSPORTATION AND STORAGE OF SWITCHGEAR IN BID.
2. CONTRACTOR SHALL INSTALL OWNER FURNISHED GENERATORS COMPLETE. CONTRACTOR SHALL ACCEPT THE GENERATORS AT DELIVERY AND STORE OFF SITE UNTIL INSTALLATION. INCLUDE ALL NECESSARY TRANSPORTATION AND STORAGE OF UNITS IN BID.
3. CONTRACTOR SHALL PROVIDE AND INSTALL NEW BUS DUCT COMPLETE.
4. CONTRACTOR SHALL PROVIDE AND INSTALL ALL NECESSARY CONDUITS. SEE DRAWING E-1.

30% DESIGN PACKAGE

LARRY M. SMITH, P.E. NO. 45967 SEAL

DRAWN BY: FR | DATE: 03/24/23
DESIGNED BY: FR/SH | SCALE:
CHECKED BY: L.M.S.
FIELD BOOK:

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

REVISIONS

NO.	DATE:	BY	CHK'D	DESCRIPTION

PROJECT # P12529
GTL WWTP EFFUENT PUMPS
GENERATOR & ADMIN BLDG. UPGRADES
GENERATOR SWITCHGEAR ONE LINE DIAGRAM

SHEET NO. E-12 | OF
TOTAL:
CAD FILE:
DRAWING FILE NO.

SEC Smith Engineering Consultants, Inc.
State Auth.: #8226
2161 Palm Beach Lakes Blvd., Suite 312
West Palm Beach, Florida 33409
(561) 616-3911 fax (561) 616-3912
www.smithengineeringconsultants.com

NON-COLLUSION STATEMENT

By signing this offer, the vendor/contractor certifies that this offer is made independently and *free* from collusion. Vendor shall disclose below any City of Fort Lauderdale, FL officer or employee, or any relative of any such officer or employee who is an officer or director of, or has a material interest in, the vendor's business, who is in a position to influence this procurement.

Any City of Fort Lauderdale, FL officer or employee who has any input into the writing of specifications or requirements, solicitation of offers, decision to award, evaluation of offers, or any other activity pertinent to this procurement is presumed, for purposes hereof, to be in a position to influence this procurement.

For purposes hereof, a person has a material interest if they directly or indirectly own more than 5 percent of the total assets or capital stock of any business entity, or if they otherwise stand to personally gain if the contract is awarded to this vendor.

In accordance with City of Fort Lauderdale, FL Policy and Standards Manual, 6.10.8.3,

> 3.3. City employees may not contract with the City through any corporation or business entity in which they or their immediate family members hold a controlling financial interest (e.g., ownership of five (5) percent or more).
>
> 3.4. Immediate family members (spouse, parents, and children) are also prohibited from contracting with the City subject to the same general rules.

Failure of a vendor to disclose any relationship described herein shall be reason for debarment in accordance with the provisions of the City Procurement Code.

NAME	RELATIONSHIPS
_____	_____
_____	_____
	_____
	_____

In the event the vendor does not indicate any names, the City shall interpret this to mean that the vendor has indicated that no such relationships exist.

_____ _____

Authorized Signature Title

_____ _____

Name (Printed) Date

CONTRACTOR'S CERTIFICATE OF COMPLIANCE WITH NON-DISCRIMINATION PROVISIONS OF THE CONTRACT

The completed and signed form should be returned with the Contractor's submittal. If not provided with submittal, the Contractor must submit within three business days of City's request. Contractor may be deemed non-responsive for failure to fully comply within stated timeframes.

Pursuant to City Ordinance Sec. 2-17(a)(i)(ii), bidders must certify compliance with the Non-Discrimination provision of the ordinance.

A. Contractors doing business with the City shall not discriminate against their employees based on the employee's race, color, religion, gender (including identity or expression), marital status, sexual orientation, national origin, age, disability, or any other protected classification as defined by applicable law.

   Contracts. Every Contract exceeding $100,000, or otherwise exempt from this section shall contain language that obligates the Contractor to comply with the applicable provisions of this section.

   The Contract shall include provisions for the following:

   (i) The Contractor certifies and represents that it will comply with this section during the entire term of the contract.

   (ii) The failure of the Contractor to comply with this section shall be deemed to be a material breach of the contract, entitling the City to pursue any remedy stated below or any remedy provided under applicable law.

_____ _____

Authorized Signature Print Name and Title

_____

Date

CONTRACT PAYMENT METHOD

The City of Fort Lauderdale has implemented a Procurement Card (P-Card) program which changes how payments are remitted to its vendors. The City has transitioned from traditional paper checks to credit card payments via MasterCard or Visa as part of this program.

This allows you as a vendor of the City of Fort Lauderdale to receive your payments fast and safely. No more waiting for checks to be printed and mailed.

In accordance with the contract, payments on this contract will be made utilizing the City's P-Card (MasterCard or Visa). Accordingly, bidders must presently have the ability to accept the credit card or take whatever steps necessary to implement acceptance of a card before the start of the contract term, or contract award by the City.

All costs associated with the Contractor's participation in this purchasing program shall be borne by the Contractor. The City reserves the right to revise this program as necessary.

By signing below, you agree with these terms.

Please indicate which credit card payment you prefer:

☐ MasterCard

☐ Visa

_____

Company Name

_____ _____

Name (Printed) Signature

_____ _____

Title Date

Solicitation/Bid /Contract No: _____

Project Description:

Contractor/Proposer/Bidder acknowledges and agrees to utilize the U.S. Department of Homeland Security's E-Verify System to verify the employment eligibility of,

A. all persons employed by Contractor/Proposer/Bidder to perform employment duties within Florida during the term of the Contract, and,

B. all persons (including subcontractors/vendors) assigned by Contractor/Proposer/Bidder to perform work pursuant to the Contract.

The Contractor/Proposer/Bidder acknowledges and agrees that use of the U.S. Department of Homeland Security's E-Verify System during the term of the Contract is a condition of the Contract.

Contractor/Proposer/ Bidder Company Name: _____

Authorized Company Person's Signature: _____

Authorized Company Person's Title: _____

Date: _____

REFERENCES

A minimum of three (3) references shall be provided. It is the responsibility of the Bidder/ Proposer to ensure that the information provided is accurate and current. The City may find your firm non-responsive for providing wrong and or outdated information. Additional references may be provided on a separate page.

Company Name: _____
Address: _____
Contact Person: _____
Title: _____
Phone #: _____
Email: _____
Contract Value: _____
Year(s): _____
Description: _____
_____
_____

Company Name: _____
Address: _____
Contact Person: _____
Title: _____
Phone #: _____
Email: _____
Contract Value: _____
Year(s): _____
Description: _____
_____
_____

Company Name: _____
Address: _____
Contact Person: _____
Title: _____
Phone #: _____
Email: _____
Contract Value: _____
Year(s): _____
Description: _____
_____
_____

CITY OF FORT LAUDERDALE BID/PROPOSAL CERTIFICATION

Please Note: It is the sole responsibility of the bidder/proposer to ensure that their response is submitted electronically through the City's on-line strategic sourcing platform prior to the bid opening date and time listed. Paper bid submittals will not be accepted. All fields below must be completed. If the field does not apply to you, please note N/A in that field.

If you are a foreign corporation, you may be required to obtain a certificate of authority from the department of state, in accordance with Florida Statute §607.1501 (visit http://www.dos.state.fl.us/).

Company: (Legal Registration) _____ EIN (Optional): _____

Address: _____

City: _____State: _____ Zip: _____

Telephone No.: _____ FAX No.: _____ Email: _____

Delivery: Calendar days after receipt of Purchase Order **(section 1.02 of General Conditions)**: _____

Total Bid Discount **(section 1.05 of General Conditions)**: _____

Check box if your firm qualifies for DBE **(section 1.09 of General Conditions)**: ❑

ADDENDUM ACKNOWLEDGEMENT - Proposer acknowledges that the following addenda have been received and are included in the proposal:

Addendum No.	Date Issued	Addendum No.	Date Issued	Addendum No.	Date Issued	Addendum No.	Date Issued

VARIANCES: If you take exception or have variances to any term, condition, specification, scope of service, or requirement in this competitive solicitation you must specify such exception or variance in the space provided below or reference in the space provided below all variances contained on other pages within your response. Additional pages may be attached if necessary. No exceptions or variances will be deemed to be part of the response submitted unless such is listed and contained in the space provided below. The City does not, by virtue of submitting a variance, necessarily accept any variances. If no statement is contained in the below space, it is hereby implied that your response is in full compliance with this competitive solicitation. If you do not have variances, simply mark N/A.

_____

The below signatory hereby agrees to furnish the following article(s) or services at the price(s) and terms stated subject to all instructions, conditions, specifications addenda, legal advertisement, and conditions contained in the bid/proposal. I have read all attachments including the specifications and fully understand what is required. By submitting this signed proposal, I will accept a contract if approved by the City and such acceptance covers all terms, conditions, and specifications of this bid/proposal. The below signatory also hereby agrees, by virtue of submitting or attempting to submit a response, that in no event shall the City's liability for respondent's direct, indirect, incidental, consequential, special or exemplary damages, expenses, or lost profits arising out of this competitive solicitation process, including but not limited to public advertisement, bid conferences, site visits, evaluations, oral presentations, or award proceedings exceed the amount of Five Hundred Dollars ($500.00). This limitation shall not apply to claims arising under any provision of indemnification or the City's protest ordinance contained in this competitive solicitation.

Submitted by:

_____ _____

Name (printed) Signature

_____ _____

Date Title

Question and Answer

Company: 10

Event #: 134-2

Event Name: GTL Switchgear Direct Purchase

Supplier: 1747

Supplier Name: GenServe

Supplier Contact: 1

Supplier Contact Name: Bob Birdsong

Date Received: 06/28/2023 08:28:58 AM

Date Answered: 06/30/2023 03:53:24 PM

Question: GenServe/OK Generators would like to be approved as a vendor on this project. We have completed many complex paralleling and MV projects, such as Fort Lauderdale and Palm Beach International Airports. We have a large 24/7 service presence
in South

Answer: The City does not approve vendors, they must meet the specifications or provide an equal. If a proposal differs from the specification the City will review and determine if the alternative if acceptable.