ARCHITECTURAL ENGINEERING DEPARTMENT
REQUEST FOR QUOTES
May 8, 2022

The City of Mobile will receive bids for the following Project:

Project Name: Fire Station No.16 (Lathan) – Emergency Generator

Project Location(s): 1951 South Maryvale Street, Mobile, Alabama 36605

Project Number: FD-054A-21

Description:
The City is accepting quotes for furnishing all labor, materials, insurance, tools, equipment and supplies, and all associated travel time and expenses required to provide and install a **new** 60kW 208Y/120V Diesel Generator, attached 580 gallon diesel double-hulled tank, and a 400A Automatic Transfer Switch at Fire Station No.16, located at 1951 Maryvale Street, Mobile, Alabama 36605, in strict accordance with the Contract Documents.

The City's Electrical Consultant, Andy Maurin, PE, of Dell Consulting has completed specifications and drawings for this work for reference. See attached *Exhibit 8 & 9.*

Scope of Work:
The Scope of Work will include the following:

1. Provide a new **60kW 208Y/120V** with a 250/3 10KAIC internal breaker diesel generator, see Exhibit 7 – Specifications.

2. Provide an attached diesel double-hulled tank, with a minimum of 48 hour run time capacity, see Exhibit 7 – Specifications.

3. Provide an ASCO Series 300 Group G Power Transfer Switch 400A Automatic Transfer Switch, or equal, see Exhibit 7 – Specifications.

4. The proposed emergency generator replacement shall have a MODBUS RS-485 to Ethernet converter supplied with the emergency generator and installed as part of the complete system. This will be used with remorte monitoring software and must be compativle with such.

5. Delivery to site: Fire Station No.16, 1951 South Maryvale Street, Mobile, AL 36605

6. All provided items must comply with the National Fire Protection Association (NFPA) 1, 30, 37, 70, 99, and 110, as applicable.

7. Warranty: Five (5) years parts and labor and Two (2) year Preventative Maintenance Service with One (1) 2-Hour Bank Load Test in Year 2.

Important Dates:

Pre-Quote Meeting:	**Tuesday, May 17, 2022 at 2:00PM local time**
Quotes Due:	**Wednesday, May 25, 2022 at 2:15PM local time**

Examination of Documents:
Before submitting a Quote, Contractors shall carefully examine this RFQ (including attachments), visit the site (including attendance at the **Mandatory** Pre-Quote meeting), fully inform themselves as to existing conditions and limitations, and include in the Quote a sum to cover the cost of all items included in the RFQ and as necessary to perform the work. The submission of a Quote will be considered as conclusive evidence that the Contractor has made such examination.

Attachments:
1. Exhibit 1 – Contract Form AIA Document A101-2017 sample
2. Exhibit 2 – DCM Sales Tax Form C-3A
3. Exhibit 3 – E-Verify Documentation
4. Exhibit 4 – Certificates of Insurance with Endorsements sample
5. Exhibit 5 - Request for Taxpayer Identification Number and Certification, W-9 Form, and City of Mobile Vendor Information Form
6. Exhibit 6 – Subcontracting & Major Supplier Plan
7. Exhibit 7 – DBE Utilization Report
8. Exhibit 8 – Specifications
9. Exhibit 9 – Drawings

Mandatory Pre-Quote Meeting shall be held on **Tuesday, May 17, 2022 at 2:00PM local time**, meet at the entrance to Fire Station No.16, 1951 South Maryvale St. Mobile, Alabama 36605**.** Suppliers shall not park in the paved driveway. Suppliers are required to have a representative present. However, if no representative can be present in person, the Supplier shall contact the Project Manager at **(251) 208-2848**, at least *24* hours prior to the meeting, in order to coordinate attendance of the meeting by conference call. Suppliers are required to participate in the Pre-Quote Conference, visit the site prior to submitting a Quote, and include all costs associated with the project in their Quotes.

All **Requests for Information (RFI's)** and requests for substitutions, shall be submitted in writing to the Project Manager no later than 2:00 PM, seven (7) business days prior to the Quote submittal date. Responses shall be in the form of a written Addendum issued to all Potential Suppliers. Receipt of all addenda shall be acknowledged by the Supplier on the Quote form. Failure to acknowledge Addenda may result in disqualification of the Quote.

THIS IS A TAX EXEMPT PROJECT:
This is a Tax-Exempt project and shall be certified by the requirements of the Alabama Department of Revenue. Suppliers shall NOT include sales and use taxes with their quote amounts. Suppliers shall complete the DCM Sales Tax Form C-3A (*Exhibit 2*) and include it as an attachment to their Quote Form.

General:
Contractors may use on-site utilities and facilities, such as power, water, staff restrooms and designated parking areas (do not block the apparatus driveway; parking area must be addressed daily with the Captain). Lock and secure vehicles and tools while working at the facility. Contractor shall have access to the work site, as approved by the Owner, between 7:00am - 6:00pm Monday through Friday. Additional access may be coordinated with the Owner representatives in advance. Limit use of premises to allow for Owner access and use of facility. The facility will remain in use during the construction period, the area must be clear of tools, debris and materials at all times to ensure the safety of the firefighters when leaving the Station for a response. Debris shall be removed and disposed of daily. No temporary storage will be available for this location. Obey all City and Facility regulations.

The new generator will be installed on the east side of the facility. The location of the generator shall meet all building and Electrical Code Clearances (ICC-IBS 2021 and NFPA/NEC 2020).

The supplier shall deliver the generator and transfer switch package on-site complete within **twenty-four (24) calendar weeks** from the date of the Notice to Proceed.

Allowances:
There is NO Contingency Allowance for this purchase. Product will be purchased upon meeting the specifications listed within the Request for Quote.

Quotes (stipulated sum):
Quotes for the above Scope of Work **will be received until 2:15PM** on Wednesday the **25th day of May, 2022**. Quotes in amounts less than $50,000 may be submitted in person, e-mailed or mailed to the Project Manager at the address indicated. Quotes $50,000 or greater shall be submitted in a sealed 9”x12” envelope with the Contractor’s General Contractors license information written on the outside of the bid envelope and placed into a receptacle, marked “City of Mobile Bids”, located in the elevator lobby outside the Office of the City Clerk, 9th Floor South Tower, Government Plaza, 205 Government Street, Mobile, Alabama 36602. Quotes for $50,000 or more shall have a Bid Surety payable to Owner, City of Mobile, in the amount of 5% of the Base Quote drawn on an Alabama bank. Contractor is responsible for his quote arriving on time.

The Quotes will be publicly opened and read at 2:30PM in the Atrium Lobby of Government Plaza. Supplier is responsible for his/her quote arriving on time.

A. No Quote may be modified, withdrawn, or canceled for a period of sixty (60) calendar days after the time designated for receipt of bids.
B. The City of Mobile will have sixty (60) days from the quote opening date to award contract.
C. Supplier shall submit a detailed itemized pricing list in addition to the Quote Form.
D. Supplier shall submit generator and transfer switch specifications.

Bond Requirements:
For contracts that exceed $10,000.00, a Bid Bond (or Bid Security), Performance Bond and a Labor and Material Payment Bond shall be required.

A. Cost of Bonds shall be included in the Contractor’s bid.
B. A Surety authorized to do business in the State of Alabama must issue Bonds.

C. The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

Bid Security/Bid Bond:

A. A Cashier's Check drawn on an Alabama bank or Bid Bond payable to Owner, City of Mobile, in the amount of 5% of the Base Bid, but in no event more than $10,000.00 is required to accompany Bid.
B. The Bid Security of the three lowest bidding Contractors shall be retained by the Owner until a contract is executed for the project.

A City of Mobile Business License is required and must be current at contract execution and throughout duration of contract.

City of Mobile Building Permits are required for this project, and all required progress and final inspections must be scheduled by the contractor. Closure of permits is a condition of final payment. There is no cost for City of Mobile permits.

Alabama Department of Environmental Management Permits are required for this project, and costs for same shall be included in the quote.

Within ten (10) calendar days from the date of issuance of Contract forms for execution, the Supplier shall deliver to the City of Mobile the following documents along with the electronically signed Owner Contractor Agreement:

1. Contract form example AIA Document A101-2017 "Agreement Between Owner and Contractor For A Stipulated Sum" (sample attached as Exhibit 1).

2. Proof of enrollment in the Federal E-Verify program (see sample document attached as Exhibit 3).

3. Certificate of Insurance and policy endorsements in accordance with City of Mobile Insurance Requirements (attached as Exhibit 4 with sample documents)

4. Company's current W-9 Tax Form and City of Mobile Vendor Information Form (attached as Exhibit 5).

   Vendor may also show evidence of enrollment in the City of Mobile's Vendor Registration System:
   https://www.cityofmobile.org/bids/vendor-portal-information/

At **Substantial Completion** of the project, the Contractor shall publish a "Notice of Final Completion" of the contract in a locally published newspaper of general circulation, in accordance with Code of Alabama, Title 39, Section 39-1-1. For final Contract Sums less than fifty thousand dollars ($50,000.00), the Contractor shall also provide an electronic or hard copy of the Notice verbiage, on company letterhead, to the Project Manager at the same time the Notice is submitted to the newspaper. Contracts over $50,000, the Contractor shall publish four successive weeks. Within five working days after publication, the Contractor shall provide an original notarized proof of publication to the Project Manager.

The "Notice of Final Completion" shall read as follows:

> STATE OF ALABAMA
> COUNTY OF MOBILE
> NOTICE OF COMPLETION
> In accordance with Chapter 1, Title 39, Code of Alabama, 1975, NOTICE IS HEREBY given that (COMPANY NAME) has completed the contract for **Fire Station No.16 (Lathan), Emergency Generator, FD-054A-21, in Mobile, Alabama 36605**. All persons having any claims for labor, material or otherwise in connection with this project should immediately notify the Architectural Engineering Department, City of Mobile, P.O. Box 1827, Mobile, AL 36633-1827.

Liquidated Damages: A time charge equal to two hundred fifty dollars ($250.00) per calendar day will be made against the Contractor for the entire period that any part of the Work remains uncompleted or required closeout documents are not acceptably submitted for more than thirty (30) calendar days after the time specified for the Substantial Completion of the Work, the amount of which shall be deducted by the Owner, and shall be retained by the Owner out of monies otherwise due the Contractor in the final payment, not as a penalty, but as liquidated damages sustained.

Contractor's Warranty: Contractor shall provide a written warrantee to the Owner that all materials furnished under the contract are of good quality and new. Contractor shall further warrant that the Work conforms to the requirements of the information contained in this Request For Quotes and will be free from defects. Work and/or materials not conforming to these requirements may be considered defective and shall, within one (1) year from date of Substantial Completion of the Project, be promptly replaced or corrected without cost to the Owner. Contractor shall also provide manufacturer's warranties for products used.

Close Out Documents: Shall consist of as built drawings, warrantees, operation & maintenance manuals, approved submittals and other documents required by the RFQ document. They shall also include original executed copies of the following AIA Documents:

1. Contractor's Affidavit of Payment of Debts and Claims - G706
2. Contractor's Affidavit of Release of Liens - G706A
3. Consent of Surety to final Payment - G707 (if bonds are required)

Contact the Project Manager, Mark Thomas, at the City of Mobile, Architectural Engineering Department, (251) 208-2848 phone or e-mail thomasm@cityofmobile.org for further clarification regarding this Request for Quotes.

Fire Station No.16 (Lathan) – Emergency Generator
FD-054A-21

QUOTE FORM:

Company Name: _____

Company Address: _____

Office Phone #: _____ **Fax #:** _____

City of Mobile Business License No.: _____

In compliance with the Request for Quotes prepared by the City of Mobile, Architectural Engineering Department, dated April 28, 2022, and all Addendum(a) No(s)_____dated_____, the undersigned does hereby propose to furnish all labor, materials, tools, equipment and supplies and to sustain all expenses incurred in performing the Scope of Work for the amount listed below. The Supplier shall deliver the work complete within Twenty-Four (24) calendar weeks from the date of the written Notice to Proceed.

- **Supplies shall NOT include sales and use taxes.**
- **Quotes shall be provided in whole dollar amount with no cents.**

Total Base Quote Amount: _____

Amount in Words

_____Dollars & No Cents **$**_____**.00**

Amount in #'s

Contact Phone #: _____**Cell #:** _____

E-mail Address: _____

Signature: _____**Date**: _____

Printed Name: _____**Title:** _____

EXHIBIT 1

DRAFT

AIA® Document A101™ – 2017

Standard Form of Agreement Between Owner and Contractor

where the basis of payment is a Stipulated Sum

AGREEMENT made as of the « » day of « » in the year « »
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

«City of Mobile»« »
«P. O. Box 1827»
«Mobile, Alabama 36633-1827»
« »

and the Contractor:
(Name, legal status, address and other information)

« »« »
« »
« »
« »

«City of Mobile Business License Number: »
«Secretary of State Registration Number: »

for the following Project:
(Name, location and detailed description)

«Fire Station No.16 (Lathan) – Emergency Generator»
«1951 South Maryvale Street»
«Mobile, Alabama 36605»
«FD-054A-21»
«For purchase of emergency generator and transfer switch»

The Architect:
(Name, legal status, address and other information)

«Architectural Engineering Department
P. O. Box 1827
Mobile, Alabama 36633-1827»

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101™–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201™–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

TABLE OF ARTICLES

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others (See attachment Exhibit A).

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

[«X »] A date set forth in a notice to proceed issued by the Owner.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

[« X »] Not later than «One-Hundred and Sixty-Eight» («168») calendar days from the date of the Notice to Proceed for commencement of the Work.

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be « ___ and 00/100 Dollars » ($ «___.00»), subject to additions and deductions as provided in the Contract Documents.

Base Bid: $
Contingency Allowance: $
Total Contract Sum: $

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price
N/A	

§ 4.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

N/A	

Contingency Allowance: and 00/100 Dollars ($000.00)

A. Contingency Allowance shall cover cost of material, labor, overhead, profit and other expenses for complete installation of items of additional work as required for a complete, functional project.
B. Contingency Allowance shall be used for unforeseen conditions not covered in the construction documents.
C. All extra work under this section must be authorized by the Owner, in writing, prior to materials or undertaking work.
D. Upon completion of the Work, the unused portion of the Allowance shall be credited back to the Owner in the form of a Change Order.
E. Allowances are subject to the same provision of AIA 201 Article 7.3.7.

§ 4.4 Unit prices, if any:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)
N/A		

§ 4.5 Liquidated damages:
(Insert terms and conditions for liquidated damages, if any.)

«A time charge equal to Two Hundred Fifty and 00/100 Dollars ($250.00) per calendar day will be made against the Contractor for the entire period that any part of the Work remains uncompleted or any required closeouts documents are not acceptably submitted for more than thirty (30) days after the date specified for the substantial Completion of the Work, the amount of which shall be deducted by the owner, and shall be retained by the Owner out of monies otherwise due the Contractor in the final payment, not as a penalty, but as liquidated damages sustained. »

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the 25th of the month.

« »

§ 5.1.3 Provided that an Application for Payment in acceptable format is received by the Architect not later than the first «1st» day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the tenth «10th» day of the «following» month. If an Application for Payment in acceptable format is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than «forty» («40») days after the Architect receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This accepted schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201, General Conditions of the Contract for Construction (including Owner's then-current modifications), and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- **.1** That portion of the Contract Sum properly allocable to completed Work;
- **.2** That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing and insured as specified;
- **.3** Completed work shall be determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- **.1** The aggregate of any amounts previously paid by the Owner;
- **.2** The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- **.3** Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- **.4** For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and
- **.5** Retainage withheld pursuant to Section 5.1.7.

§ 5.1.6.3 Any Progress Payment shall include partial release of liens for material and labor for previous application for payment amount approved and paid. The DBE Utilization Report shall be included with the pay application.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

«Five percent (5%) of the first fifty percent (50%) of the completed work and after fifty percent (50%) completion has been accomplished, no further retainage shall be held from the original Contract Sum. Increases in the contract sum by Change Order shall also be subject to retainage.»

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

«N/A »

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage upon Substantial Completion.)

«The net amount of the Retainage shall be equal to two and one half percent (2.5%) of total Contract Sum, as increased or decreased by Change Order.»

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201.

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final monthly progress payment, constituting the entire unpaid balance of the Contract Sum, less retainage, shall be made by the Owner to the Contractor when

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201 (including Owner's then-current modifications which may be obtained from the Owner or, alternatively, a copy of which is incorporated in the Project Manual and incorporated by reference herein as a part thereof), and to satisfy other requirements, if any, which extend beyond final payment; and

.2 a Certificate of Substantial Completion has been issued by the Architect/Owner and the project accepted.

§ 5.2.2 The Owner's final payment to the Contractor of retainage shall be made as follows:

« The final two and one half percent (2.5%) of the total Contract Sum retained will not be paid until proof of publication is submitted and all written claims paid in full. Contractor to submit the following:
•Contractor's Affidavit of Payment of Debts and Claims (AIA form G706, included in contract documents) with
a.) Contractor's Release or Waiver of Liens
b.) Releases or Waivers of Liens from Subcontractors and Material and Equipment Suppliers;
•Contractor's Affidavit of Release of Liens (AIA form G706A, included in contract documents);
•Consent of Surety, if any, to final payment (AIA form G707, included in contract documents);
•Any additional close out requirements per the contract documents; and
•Notarized Affidavit of Notice of Completion advertisement from publisher.

Contractor shall provide proof of publication of Notice of Completion in a local newspaper once per week for four (4) consecutive weeks, as required in the Title 39, Section 39-1-1, Subsection (f), of the Code of Alabama quoted below. "The Contractor shall, immediately after the completion of the contract, give notice of Completion by an advertisement in a newspaper of general circulation published within the city or county in which the work has been done, for a period of four (4) consecutive weeks. A final settlement shall not be made upon the contract until the expiration of thirty (30) days after the completion of the notice. Proof of publication of the notice shall be made by the contractor to the authority by whom the contract was made by affidavit of the publisher and a printed copy of the notice published. If no newspaper is published in the county in which the work is done, the notice may be given by the contract." (Acts 1927, No. 39, 9.37; Acts 1935, No. 39, 9. 70; Code 1940, T. 50, Section 16; Acts 1983, No. 83-737, 9.1203; Acts 1989, No. 89-650m 9. 1284, Section 1; Acts 1994, No. 94-207, p, 270, Section 1; Acts 1997, No. 97-225, p. 348, Section 1.)

The Notice of Completion shall read as follows:

STATE OF ALABAMA
COUNTY OF MOBILE
NOTICE OF COMPLETION

In accordance with Chapter I, Title 39, Code of Alabama, 1975, NOTICE IS HEREBY given that ( ) has completed the contract for ( ). All persons having any claims for labor, material or otherwise in connection with this project should immediately notify the Architectural Engineering Department, City of Mobile, P. O. Box 1827, Mobile, Alabama 36633-1827.

Publication of the Notice of Completion shall not begin until the Project has been accepted as Substantially Complete by the City of Mobile. »

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Engineer will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

«N/A »

§ 6.2 Binding Dispute Resolution

For any Claim, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

[« X »] Litigation in a court of competent jurisdiction

§ 6.3 Governing Law and Venue

This Agreement shall be governed by the laws of the State of Alabama, and the appropriate venue of any actions arising out of this Agreement shall be a court of proper jurisdiction in Mobile, Alabama.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201, General Conditions of the Contract for Construction, including Owner's then-current modifications, a copy of which is incorporated in the contract documents and incorporated by reference herein as a part thereof..

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201, General Conditions of the Contract for Construction, including Owner's then-current modifications, a copy of which is incorporated in the contract documents and incorporated by reference herein as a part thereof.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents. A copy of such amended, revised or supplemental provision is incorporated in the contract documents and hereby incorporated by reference herein as a part thereof.

§ 8.2 The Owner's representative:
(Name, address, email address, and other information)

«Director, Real Estate and Asset Management»
«P. O. Box 1827»
«Mobile, Alabama 36633-1827»

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

« »
« »

« »**§ 8.4** Neither the Owner's nor the Contractor's representative shall be changed without ten (10) days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth below:
The Contractor shall purchase and maintain from a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

.1 Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
.4 Claims for damages insured by usual personal injury liability coverage;
.5 Claims for damages, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
.6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
.7 Claims for bodily injury or property damage arising out of completed operations; and
.8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18 of the General Conditions of the Contract for Construction.

The Contractor shall take out and maintain during the life of the Contract no less than the following amounts of insurance with the City of Mobile named as an additional insured. Contractor shall submit a Certificate of Insurance. Insurance companies listed as the "Companies Affording Coverage" shall be authorized by the Secretary of the State of Alabama. Insurance produced out of the State of Alabama must be signed or counter signed by a licensed Agent of Alabama, with the Agent's name, address and telephone number typed or printed on the face of the Certificate of Insurance.

.1 Workmen's Compensation Insurance: - Statutory-amount and coverage as required by all applicable laws, rules or regulations of the State of Alabama and the United States of America,

.2 Employee's Liability Insurance shall be provided for limits of liability not less than:

A.	Bodily Injury by Accident	$1,000,000 each accident
B.	Bodily Injury by Disease	$1,000,000 each employee
C.	Bodily Injury by Disease	$1,000,000 each policy

.3 The Contractor shall provide Broad Form (commonly termed Comprehensive) General Liability Insurance (including premises-product-completed operations, independent contractors, and blanket contractual liability), specifically covering the obligations assumed by the Contractor for limits of liability not less than:

A.	Bodily Injury	$1,000,000 each person $1,000,000 each occurrence
B.	Property Damage	$1,000,000 each occurrence; or
C.	Bodily Injury and Property Damage	$1,000,000 combined single limit

.5 Such comprehensive policy shall include the following:

A. All liability of the Contractor, for the Contractor's Direct Operations.

B. Subcontractor's Operations.
C. Completed Operations Cover, thereby meaning any loss which shall occur after the contract has been completed, but which can be traced back to the Contract.
D. Contractual Liability, meaning thereby; any risk assumed by the Contractor under Hold Harmless Agreements or any other assumption of liability, but specifically items 11.1.1.8.3G herein below
E. Broad Form Property damage Coverage, including Completed Operations.
F. Personal Injury Liability, with employee's exclusions removed.
G. Explosion and Collapse Hazard:
Included or X Not Applicable.
H. Underground Hazard:
Included or X Not Applicable.

.7 The Contractor shall carry for himself and shall require that all Subcontractors and all Owners of Automobiles or trucks rented or hired on the contract carry, until the Contracts is completed, Comprehensive Automobile Liability Coverage for Bodily Injury and property. Damage for any auto in amounts not less than the minimum amounts as indicated. The Contractor and Subcontractor shall also carry for themselves insurance for all non-owned and hired automobile at the limits of liability as indicated below:

A.	Bodily Injury	$1,000,000 each person $1,000,000 each occurrence
B.	Property damage	$1,000,000 each occurrence; or,
C.	Bodily Injury and Property damage	$1,000,000 combined single limit

.8 Umbrella/Excess Liability: $2,000,000 combined single limit each occurrence for bodily injury and/or property damage

.9 Builder's Risk Coverage (Property Insurance): The Contractor shall carry for the Owner, himself, and all Subcontractors a Builder's Risk Policy to cover the full amount of the Contract during construction, fabrication or erection of any equipment.

A. The Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors, Sub-subcontractors, and the Design Professionals in the Project.

B. Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.

C. If the property insurance requires deductibles, the Contractor shall pay costs not covered because of such deductibles. Deductibles shall be limited to a maximum of $2,500.00 unless the loss is caused by windstorm; then deductible shall be a maximum of three percent (3%) of the insured value.

D. This property insurance shall cover the full value of equipment, material, and other portions of the Work stored off the site, and also portions of the Work in transit. There shall be no limits on the value of loss per occurrence.

E. A named storm endorsement is required. The deductible shall be a maximum of three percent (3%) of the insured value.

.10 A Surety authorized to do business in the State of Alabama shall furnish the required Insurance.

.11 The standard ACORD™ format shall be provided. The ACORD™ Certificate must be signed or countersigned by a Licensed Resident Agent of the State of Alabama and the agent's name, address and telephone number must appear on the face of the certificate.

.12 The Surety must have a minimum rating of A/Class VI as reported in the latest issue of Best's Key Rating Guide Property-Casualty, published by Alfred M. Best Company, Inc. if the bid price exceeds $50,000.00.

The insurance shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

Certificates of insurance acceptable to the Owner shall be filed with the Owner within ten (10) calendar days from date of issuance of contract forms for execution. Contractor shall deliver to the City of Mobile, certificates of insurance certifying the existence and limits of the insurance coverages along with separate policy endorsements. Contractor shall also be responsible for delivering policy renewal certificates to the City of Mobile, and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies shall contain a provision that coverages afforded under the policies will not be cancelled subject to non-renewal nor material change, or allowed to expire without at least thirty (30) days' (except ten (10) days from non-payment) prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the time. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

All policies of insurance, except worker's compensation, shall be endorsed to provide that all such insurances are primary and non-contributing with any other insurance maintained by the City of Mobile and endorsed to waive rights of subrogation in favor of the City of Mobile.

The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's Consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

§ 8.5.2 The Contractor shall provide bonds as set forth below:
Contractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder.

Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

The Labor and Material Payment Bond and the Performance Bond shall each be for one hundred percent (100%) of the Contract Sum.

1. Bond shall be submitted with the executed agreement on provided form(s).

2. Power of Attorney is required for both bonds.

3. A Surety authorized to do business in the State of Alabama shall furnish both bonds.

4. A Surety licensed to do business in the State of Alabama must execute the bonds.

5. The Surety must have a minimum rating of A/Class VI as reported in the latest issue of Best's Key Rating Guide Property-Casualty, published by Alfred M. Best Company, Inc., if the bid price exceeds $50,000.00.

6. The Surety company shall be required to execute AIA Document G-707, "Consent of Surety to Final Payment" prior to Final Payment being made to the Contractor.

§ 8.6 Indemnification:
The Contractor shall indemnify, defend and hold harmless City and its officers, elected officials, agents, representatives, and employees in respect of any and all claims, injuries, losses, diminution in value, damages, liabilities, whether or not currently due, and related expenses (including without limitation, settlement costs and any legal or other expenses for investigating or defending any actions or threatened actions) arising from or in connection with the contractor's performance under this agreement, including but not limited to, environmental laws, regulations, orders and decrees of whatever character or nature and damage or injury to persons or property. Contractor hereby confirms and agrees that Contractor is not a 'design professional' as defined in Alabama Act 2021-318, and not required to carry professional liability insurance for the performance or obligations of this contract.

§ 8.7 Other Provisions:
«Contractor shall provide a minimum one (1) year warranty from the date of substantial completion of all Labor and Materials for the Work covered by this contract, unless otherwise specified. Labor and Material warranties required by other sections of the construction document shall not conflict with this provision. The most stringent warranty provision shall apply.»

§ 8.8 Force Majeure:
In the event that either party hereto shall be delayed or hindered in or prevented from the performance of any act required hereunder by reason of strikes, lockouts, labor troubles, inability to procure materials, failure of power, restrictive governmental laws or regulations, riots, insurrection, war, Act of God, or other reason of a like nature not the fault of the party delayed in performing work or doing acts required under the terms of this Agreement, then performance of such act shall be excused for the period of the delay and the period for the performance of any such act shall be extended for a period equivalent to the period of such delay.

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor

.2 AIA Document A201, General Conditions of the Contract for Construction, including Owner's then-current modifications, a copy of which is incorporated in the contract documents and incorporated by reference herein as a part thereof.

.3 Drawings

Number	Title	Date

.4 Specifications

Section	Title	Date
DIVISION 01:	**GENERAL REQUIREMENTS**	

.5 Addenda, if any:

Number	Date

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.6 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

1. Exhibit 1 – Contract Form AIA Document A101-2017 sample
2. Exhibit 2 – DCM Sales Tax Form C-3A
3. Exhibit 3 – E-Verify Documentation
4. Exhibit 4 – Certificates of Insurance with Endorsements sample
5. Exhibit 5 – Subcontracting & Major Supplier Plan
6. Exhibit 6 – DBE Utilization Report
7. Exhibit 7 – Specifications
8. Exhibit 8 – Drawings

§ 9.2
Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
N/A			

§ 9.2.1 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

§ 9.2.2 Best Management Practices (BMPs):
The Contractor shall be responsible for providing, implementing and maintaining BMPs for sediment and erosion control in full compliance with all applicable Local, State and Federal Codes and Ordinances throughout the contract period. All Work shall be in accordance with the Clean Water Act; the Alabama Water Pollution Control Act; the current version of the Alabama Handbook for Erosion Control, Sediment Control Stormwater Management on Construction sites and Urban Areas; and the current version of the Mobile, Alabama City Code Chapter 17 Stormwater Management and Flood Control. All Waste water with oils, grease, paint, mortar, etc., shall be properly contained and disposed of.

§ 9.2.3 Contractor shall comply with all Federal, State and local laws concerning nondiscrimination, including but not limited to City of Mobile Ordinance No. 14-034 which requires, *inter alia*, that all contractors performing work for the City of Mobile not discriminate on the basis of race, creed, color, national origin or disability, require that all subcontractors they engage do the same, and make every reasonable effort to assure that fifteen percent of the work performed under contract be awarded to socially and economically disadvantaged individuals and business entities.

§ 9.2.4 By signing this contract, the contracting parties affirm, for the duration of the agreement, that they will not violate federal immigration law or knowingly employ, hire for employment, or continue to employ an

unauthorized alien within the State of Alabama. Furthermore, a contracting party found to be in violation of this provision shall be deemed in breach of the agreement and shall be responsible for all damages resulting therefrom.

§ 9.2.5 Public Contracts with Entities Engaging in certain Boycott Activities:
By signing this contract, the Contractor further represents and agrees that it is not currently engaged in, nor will it engage in, any boycott of a person or entity based in or doing business with a jurisdiction with which the State of Alabama can enjoy open trade.

§ 9.2.6 Severability Clause:
In case any one or more of the provisions contained in this Agreement shall for any reason be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provisions of this Agreement, but this Agreement shall be construed as if such invalid or illegal or unenforceable provision had never been contained herein. Upon such determination that any term or other provision is invalid, illegal or unenforceable, the court or other tribunal making such determination is authorized and instructed to modify this Agreement so as to effect the original intent of the parties as closely as possible so that the transactions and agreements contemplated herein are consummated as originally contemplated to the fullest extent possible.

§ 9.2.7 Non-Agency Clause:
Contractor, in the performance of its operations and obligations hereunder, shall not be deemed to be an agent of City but shall be deemed to be an independent Contractor in every respect and shall take all steps at its own expense, as City may from time to time request, to indicate that it is an independent Contractor. City does not and will not assume any responsibility for the means by which or the manner in which the services by Contractor provided for herein are performed, but on the contrary, Contractor shall be wholly responsible therefore.

REMAINDER OF PAGE INTENTIONALLY LEFT BLANK

This Agreement entered into as of the day and year first written above.

City of Mobile

Legal Name of Party to Contract:
Contractor:

OWNER *(Signature)*

CONTRACTOR *(By Signature)*

William S. Stimpson, Mayor
(Printed name and title)

(Printed name and title)

ATTEST:

_____
City Clerk

STATE OF ALABAMA
COUNTY OF MOBILE
Before me, the undersigned a Notary Public in and for said County and State, personally appeared _____ as _____ of _____ and after being duly sworn, did depose and say that he, as such officer and with full authority, signed the above and foregoing voluntarily as the act of said corporation on the day the same bears date.
Sworn to and subscribed for me this _____ day of _____, 20_____.

_____
NOTARY PUBLIC
My Commission Expires: _____

EXHIBIT 2

ACCOUNTING OF SALES TAX
Attachment to DCM Form C-3: Proposal Form

To: CITY OF MOBILE (Awarding Authority) Date: _____

NAME OF PROJECT Fire Station No.16 (Lathan) - Emergency Generator

_____

SALES TAX ACCOUNTING

Pursuant to Act 2013-205, Section 1(g) the Contractor accounts for the sales tax NOT included in the bid proposal form as follows:

ESTIMATED SALES TAX AMOUNT

BASE BID: $_____

Alternate No. 1 (N/A (Insert key word for Alternate)) ☐ (add) ☐ (deduct) $_____

Alternate No. 2 (N/A) ☐ (add) ☐ (deduct) $_____

Alternate No. 3 (N/A) ☐ (add) ☐ (deduct) $_____

Alternate No. 4 (N/A) ☐ (add) ☐ (deduct) $_____

Alternate No. 5 (N/A) ☐ (add) ☐ (deduct) $_____

Alternate No. 6 (N/A) ☐ (add) ☐ (deduct) $_____

Failure to provide an accounting of sales tax shall render the bid non-responsive. Other than determining responsiveness, sales tax accounting shall not affect the bid pricing nor be considered in the determination of the lowest responsible and responsive bidder.

Legal Name of Bidder _____

Mailing Address _____

***By (Legal Signature)** _____

*Name (type or print) _____ *(Seal)*

*Title _____

Telephone Number _____

Email Address _____

Note: A completed DCM Form C-3A: Accounting of Sales Tax must be submitted with DCM Form C-3: Proposal Form. Submission of DCM Form C-3A with DCM Form C-3 is required, it is not optional. A proposal shall be rendered non-responsive if an Accounting of Sales Tax is not provided.

EXHIBIT 3

Company ID Number:

Approved by:

Employer	
Name (Please Type or Print)	
Signature	Date
Department of Homeland Secu[illegible] Division	
Name (Please Type or P[illegible]	Title
Signature	Date

E-Verify

Company ID Number:

Information Required for the E-Verify Program **Information relating to your Company:**	
Company Name	
Company Facility Address	
Company Alternate Address	
County or Parish	
Employer Identification Num	
North American Industry Classification Systems Code	
Parent Company	
Number of Employees	
Number of Sites Verified for	

EXHIBIT 4

City of Mobile Insurance Requirements
Contractor

Insurance – For the duration of this agreement, the Contractor shall maintain the following minimum amounts for this project:

A. Workers' Compensation/Employer's Liability:

1. Workers' Compensation insurance in the amounts required by all applicable laws, rules or regulations of the state of Alabama.

2. Employer's Liability with limits of not less than:

Bodily Injury by Accident	$1,000,000 each accident
Bodily Injury by Disease	$1,000,000 policy limit
Bodily Injury by Disease	$1,000,000 each employee

3. Borrowed Servant/Alternate Employer endorsement in favor of City of Mobile.

B. Comprehensive General Liability Insurance:

1. Comprehensive General Liability (occurrence form) including coverage for products/completed operations, independent contractors, blanket contractual liability specifically covering the obligations assumed by Contractor.

2. Limit of Liability: $1,000,000 combined single limit of liability each occurrence bodily injury or property damage.

3. General Aggregate Limit shall apply on a "Per Project" Basis.

C. Automobile Liability Insurance:

1. Automobile Liability Insurance to cover any auto, including all owned, non-owned, and hired vehicles, with a $1,000,000 combined single limit of liability each accident for bodily injury and/or property damage.

D. Excess/Umbrella Liability Insurance

1. Providing following form coverage for Employer's Liability, Comprehensive General Liability, and Automobile Liability.

2. Limit of Liability: $2,000,000 combined single limit of liability each occurrence for bodily injury and/or property damage.

CERTIFICATE OF LIABILITY INSURANCE ENDORSEMENT PAGE

The policy endorsements listed below are required and must be listed in the "Description of Operations" box on the Certificate of Liability Insurance or listed **separately** on an attachment to the certificate of insurance (ACORD 101, Additional Remarks Schedule).

Waiver of Subrogation - All policies of insurance shall be endorsed to waive rights of subrogation in favor of City of Mobile.

Additional Insured - All policies of insurance, except those referenced under paragraph A, shall be endorsed to name City of Mobile as an Additional Insured

Primary Insurance - All policies of insurance, except those referenced under paragraph A, shall be endorsed to provide that all such insurances are primary and non-contributing with any other insurance maintained by City of Mobile.

Certificates of Insurance - General – Within ten (10) calendar days from date of issuance of Contract forms for execution, Consultant shall deliver to the City of Mobile, certificates of insurance (standard ACORD format) certifying the existence and limits of the insurance coverages along with separate policy endorsements as described above. Consultant shall also be responsible for delivering policy renewal certificates to the City of Mobile. A sample Certificate of Liability Insurance form, including the policy endorsement is attached for Consultant's reference.

ACORD®

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:
	PHONE (A/C, No, Ext): / FAX (A/C, No):
	E-MAIL ADDRESS:

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A :	
INSURER B :	
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
X	COMMERCIAL GENERAL LIABILITY						EACH OCCURRENCE	$ 1,000,000
	CLAIMS-MADE X OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 1,000,000
X	Contractual Liability	X	X				MED EXP (Any one person)	$ 5,000
							PERSONAL & ADV INJURY	$ 1,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$ 1,000,000
	POLICY X PRO-JECT LOC						PRODUCTS - COMP/OP AGG	$ 1,000,000
	OTHER:							$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
X	ANY AUTO						BODILY INJURY (Per person)	$
	OWNED AUTOS ONLY / SCHEDULED AUTOS	X	X				BODILY INJURY (Per accident)	$
	HIRED AUTOS ONLY / NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
								$
X	UMBRELLA LIAB X OCCUR						EACH OCCURRENCE	$ 2,000,000
	EXCESS LIAB CLAIMS-MADE	X	X				AGGREGATE	$ 2,000,000
	DED RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY						X PER STATUTE / OTH-ER	1,000,000
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y / N (Mandatory in NH)	N / A	X				E.L. EACH ACCIDENT	$
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$

SAMPLE

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

PROJECT NAME: PROJECT NUMBER:

The City of Mobile is included as an Additional Insured in respect to General Liability, Automobile Liability and Umbrella Liability. All policies, except workers compensation, shall be Primary and Non-Contributory with any other insurance in force or which may be purchased by Additionally Insured, Waiver of Subrogation applies, in favor of City of Mobile with respect to General Liability, Automobile Liability, and Workers Compensation and Employer's Liability. 30-Days Notice of Cancellation, non-renewal or material change shall apply (except 10 days

CERTIFICATE HOLDER	CANCELLATION
City of Mobile Building Services Department P.O. Box 1827 Mobile, AL 36633-1827	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE

ACORD 25 (2016/03) The ACORD name and logo are registered marks of ACORD

EXHIBIT 5

CITY OF MOBILE, AL
VENDOR INFORMATION FORM

Company Information:

1. City Vendor Number:

2. Name of Company:

3. Company D.B.A. Name, if any:

4. Mailing Address:

5. Remittance Address:

6. Telephone:

7. Fax

8. Main Email:

Primary Contact:

9. Contact Name and Title:

10. Contact Phone:

11. Contact Fax:

12. Contact Email:

Alternate Contact (if applicable):

13. Alt. Contact Name and Title:

14. Alt. Contact Phone:

15. Alt. Contact Fax:

16. Alt. Contact Email:

City of Mobile Business License Information:

17. City of Mobile Business License No. (if required):

Please attach additional sheets if necessary.

Form **W-9**
(Rev. December 2011)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Print or type
See Specific Instructions on page 2.

Name (as shown on your income tax return)

Business name/disregarded entity name, if different from above

Check appropriate box for federal tax classification:
☐ Individual/sole proprietor ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ►

☐ Other (see instructions) ►

☐ Exempt payee

Address (number, street, and apt. or suite no.)

Requester's name and address (optional)

City, state, and ZIP code

List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on the "Name" line to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social security number

			–			–				

Employer identification number

		–							

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. citizen or other U.S. person (defined below).

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 4.

Sign Here Signature of U.S. person ► Date ►

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

Note. If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

OFFICE OF SUPPLIER DIVERSITY

CITY OF MOBILE

Subcontracting and Major Supplier Plan

Contact Office of Supplier Diversity for questions on completing this form.
Via emai:Archnique.kidd@cityofmobile.org
251.208.7967
205 Government Street, 4th Floor

Bidders and Proposers – Please complete and submit these forms as required by your City of Mobile Bid or Proposal Specification.

This document provides information to the City of Mobile about the subcontractors and major suppliers you intend to use to complete this contract. Failure to submit this form, when so required by the bid or proposal specification, will render your bid non-responsible. Not all specifications require this form to be completed, or may require its completion under varying circumstances. Refer to the specification for direction.

The City of Mobile will use this form to:

- Understand your intended use of subcontractors and major suppliers as part of your bid/proposal submission.
- Evaluate your capability to complete the performance of this contract.
- Determine your use of Disadvantaged Business Enterprises (DBEs) as subcontractors and suppliers.
- For certain contracts, assess whether you exercised "good faith efforts" to use DBE subcontractors and suppliers for at least 15% of the value of your bid/proposal amount. (See City of Mobile City Code Sec. 14-2.)

EXHIBIT 6

Include this form with your bid/proposal submission. Should your bid be considered the lowest responsible bid, you will have the opportunity to update this form at contract signature. You also will be required to re-verify your information at contract conclusion.

The bid specification may require you to attempt in "good faith" to use DBE subcontractors and suppliers for at least 15% of the value of your bid in the performance of this contract. If you don't have that level of DBE subcontractor / supplier usage (as documented on **Form 1)**, you are required to complete the "good faith effort" documentation on **Form 2**. When so required, failure to adequately address the good faith effort factors on **Form 2** will render your bid or proposal as non-responsive. The determination whether the bid or proposal adequately demonstrates and documents a DBE subcontractor/supplier plan, or good faith efforts to complete such a plan, will be at the sole discretion of the City of Mobile. You are encouraged to work with the City of Mobile Supplier Diversity Manager when preparing this form.

About **"DBEs"**: The City of Mobile considers businesses owned by minorities, women, or disabled veterans to be DBEs. Please consult with the City Supplier Diversity Manager for clarification or lists of certified DBEs.

About **"Good Faith" Effort**: The City of Mobile expects contractors holding large contracts to recruit and engage DBEs to be a part of their team. If the specification sets, and you cannot meet, the 15% target, you must show us how you attempted to recruit and engage DBEs to meet this target. This helps the City identify DBE market weaknesses for development, and ensures all bidders are equally considering this obligation in preparing a bid. The "good faith effort" factors on **Form 2** are not intended to be a mandatory, exhaustive, or exclusive. They are a tool to help you, and to help the City consistently and fairly consider your effort.

Contact Office of Supplier Diversity for questions on completing this form.
Via emai:Archnique.kidd@cityofmobile.org
251.208.7967
205 Government Street, 4th Floor

FORM 1: Background and Plan

Section I. Information about your company

Company	
Address	
Telephone	
E-Mail	

RFP/RFQ Solicitation Number	
Project Description	
Is your company a DBE company?	Yes ☐ No ☐
Work force demographics	Male _____ Female _____ Minority _____ Non-minority _____ Vets _____ Total #of Employees _____

Subcontractor/Major Supplier Plan submitted by:

Printed Name: _____

Signature: _____Date: _____

Title: _____

The following employee will be designated as the **DBE Liaison** for all communication regarding DBE participation including documentation for DBE participation and maintenance of records of Good Faith Efforts for this contract award:

Name: _____Title: _____

E-mail:_ Phone: _____

Contact Office of Supplier Diversity for questions on completing this form.
Via emai:Archnique.kidd@cityofmobile.org
251.208.7967
205 Government Street, 4th Floor

FORM 1: Background and Plan

Section II. Plan for Subcontractors and Major Vendors

This form asks for your intentions to utilize subcontractors and suppliers as a potential contractor for the city of Mobile. For purposes of this form, disadvantaged individuals or enterprises include persons or small-business-enterprise owners who are women, members of a racial minority, or disabled military veterans.

RFP/RFQ/Bid # _____ Your Bid/Proposal Amount $_____ Date: _____/ _____/____

Description_____

Name of Bidder/Proposer: _____

I intend to use the following subcontractors: (Attach additional pages if necessary)

Subcontractor or Major Supplier	Phone	Scope of Work to be performed	$$ Value to be Performed	% Of Your Bid Amount	DBE?	Official Verification Only

Form 2: Good Faith Effort Documentation

Name of Bidder: _____

Contact Person: _____ Phone_____ Email_____

Please complete this form if you are unable to identify DBE subcontractors or suppliers to reach 15% of the value of your bid.

YES (☐)	NO (☐)	**Did you do these suggested areas for DBE recruitment and engagement**
		PRE-BID MEETING(S): The bidder attended all pre-bid meetings scheduled by the City to inform DBEs of contracting and subcontracting opportunities.
		CMDBE/ALDOT DBE LIST(S): The bidder utilized the Office of Supplier Diversity's list or lists of certified ALDOT DBE 's
		SMALL CONTRACT(S): The bidder selected specific portions of the work to be performed by DBEs in order to increase the likelihood of meeting the DBE goals (including breaking down contracts into smaller units to facilitate DBE participation). Consider support services, including insurance, accounting, temporary labor, and transportation, landscaping, and janitorial as potential areas for DBE use.
		FOLLOW-UP: The bidder followed-up initial indications of interest by DBEs by contacting those DBEs to determine with certainty if they remained interested in bidding.
		ADVERTISEMENT: The bidder advertised in general circulation and/or trade association publications concerning subcontracting opportunities, and allowed DBEs reasonable time to respond.
		INTERNET ADVERTISING: The bidder advertised DBE and/or subcontracting opportunities on the *City of Mobile* Facebook page or other internet portals that are accessible to DBEs and/or potential subcontractors.
		GOOD FAITH NEGOTIATIONS: The bidder negotiated in good faith with interested DBEs and did not reject DBEs as unqualified without sound business reasons based on a thorough investigation of their capabilities.

		INFORMATION: The bidder provided interested DBEs with adequate information about the plans, specifications and requirements of the subcontract.
		WRITTEN NOTICE(S): The bidder/proposer took the necessary steps to provide written notice in a manner reasonably calculated to inform DBEs of subcontracting opportunities and allowed sufficient time for them to participate effectively.
		COMMUNITY RESOURCES: The bidder/proposer used the services of available community organizations, small and/or disadvantaged business assistance offices and other organizations that provided assistance in the recruitment and placement of DBE firms.
		CONTRACT RECORDS: The bidder/proposer has maintained the following records for each DBE that has bid on the subcontracting opportunity: 1. Name, address, and telephone number; 2. A description of information provided by the bidder/proposer or subcontractor; and 3. A statement of whether an agreement was reached, and if not, why not, including any reasons for concluding that the DBE was unqualified to perform the job.

Please indicate if any of the following applied:

_____ There are not ways to break out 15% of the value of this contract for subcontractors / suppliers.

_____ Could not find sufficient DBEs to provide subcontracting or supplier services.

_____ DBEs were available but did not have sufficient qualifications or experience to meet the needs of this contract.

Please indicate additional efforts you have taken to recruit and engage DBEs. _____

_____

_____

Suggestions or comments to improve this program. _____

_____

OFFICE OF SUPPLIER DIVERSITY

CITY OF MOBILE

DBE Compliance

DBE UTILIZATION REPORT

Return to Office of Supplier Diversity
Via email: archnique.kidd@cityofmobile.org
or
P.O. Box 1948
Mobile, AL 36633

CONTRACTOR:	Certified DBE: YES NO	Contract Start Date:
DESCRIPTION:		Estimated Completion Date:

This report is for the month of: (CHECK ONE):

JAN FEB MARCH APR MAY JUNE JULY AUG SEPT OCT NOV DEC

FINAL _____

Original Contract Amount	Total Amount of Contract Changes (change orders or amendments)	Final Contract Amount (include contract changes)	Payments to Date from City of Mobile	OFFICE USE ONLY (Verification)
$	$	$	$	

Instructions: List all DBEs utilized on the contract, whether or not the firms were originally listed for DBE goal credit. List actual amount paid to each DBE firm. If the established Percentage is not being met, please include a narrative description of the progress being made in DBE participation.

DBE SUBCONTRACTOR	DBE DESCRIPTION OF WORK	DBE SUBCONTRACT AMOUNT	DBE PAYMENTS THIS REPORT	PAYMENTS TO DATE	OFFICE USE ONLY (Verification)
		$	$	$	
		$	$	$	
		$	$	$	
		$	$	$	
TOTALS		$	$	$	

I HEREBY CERTIFY THAT THE INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT. SUPPORTING DOCUMENTATION IS ON FILE AND IS AVAILABLE FOR INSPECTION BY CITY OF MOBILE OFFICE OF SUPPLIER DIVERSITY PERSONNEL AT ANY TIME.

PRINT NAME: _____

SIGNATURE: _____, _____ ___/___/____
(Title) (Date)

EXHIBIT 7

EXHIBIT 8 – SPECIFICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.

1.2 SUMMARY

A. THIS SECTION INCLUDES PACKAGED DIESEL ENGINE GENERATOR SETS WITH THE FOLLOWING FEATURES AND ACCESSORIES:

1. BATTERY CHARGER.
2. BASE MOUNTED FUEL TANK.
3. ENGINE-GENERATOR SET.
4. MUFFLER.
5. OUTDOOR ENCLOSURE.
6. REMOTE STOP SWITCH.
7. STARTING BATTERY.
8. BLOCK HEATER.

B. RELATED SECTIONS INCLUDE THE FOLLOWING:

1. DIVISION 16 SECTION "TRANSFER SWITCHES" FOR TRANSFER SWITCHES INCLUDING SENSORS AND RELAYS TO INITIATE AUTOMATIC-STARTING AND -STOPPING SIGNALS FOR ENGINE-GENERATOR SETS.

1.3 DEFINITIONS

A. OPERATIONAL BANDWIDTH: THE TOTAL VARIATION FROM THE LOWEST TO HIGHEST VALUE OF A PARAMETER OVER THE RANGE OF CONDITIONS INDICATED, EXPRESSED AS A PERCENTAGE OF THE NOMINAL VALUE OF THE PARAMETER.

B. STEADY-STATE VOLTAGE MODULATION: THE UNIFORM CYCLICAL VARIATION OF VOLTAGE WITHIN THE OPERATIONAL BANDWIDTH, EXPRESSED IN HERTZ OR CYCLES PER SECOND.

1.4 SUBMITTALS

A. PRODUCT DATA: INCLUDE THE FOLLOWING:

1. DATA ON FEATURES, COMPONENTS, ACCESSORIES RATINGS, AND PERFORMANCE.
2. THERMAL DAMAGE CURVE FOR GENERATOR.
3. TIME-CURRENT CHARACTERISTIC CURVES FOR GENERATOR PROTECTIVE DEVICE.
4. RECOMMENDED CIRCUIT BREAKER SETTING.
5. LOAD CALCULATIONS SHOWING MAXIMUM VOLTAGE DROP FOR EACH STEP.
6. EXHAUST SYSTEM INSULATION.
7. RAIN CAP.
8. EQUIPMENT ENCLOSURE WITH WIND RATING.
9. FUEL TANK WITH REQUIRED FUEL CONTAINMENT AND SAFEGUARDS.
10. PERMIT FOR FUEL STORAGE TANK AS REQUIRED BY THE MOBILE FIRE AND RESCUE DEPARTMENT.
11. EMERGENCY STOP SWITCH AND WIRING REQUIREMENTS.

B. SHOP DRAWINGS: DETAIL EQUIPMENT ASSEMBLIES AND INDICATE DIMENSIONS, WEIGHTS, LOADS, REQUIRED CLEARANCES, METHOD OF FIELD ASSEMBLY, COMPONENTS, AND LOCATION AND SIZE OF EACH FIELD CONNECTION.

1. DIMENSIONED OUTLINE PLAN AND ELEVATION DRAWINGS OF ENGINE-GENERATOR SET AND OTHER COMPONENTS SPECIFIED.
2. DESIGN CALCULATIONS: SIGNED AND SEALED BY A QUALIFIED PROFESSIONAL ENGINEER. CALCULATE REQUIREMENTS FOR SELECTING VIBRATION ISOLATORS AND SEISMIC RESTRAINTS AND FOR DESIGNING VIBRATION ISOLATION BASES.
3. VIBRATION ISOLATION BASE DETAILS: SIGNED AND SEALED BY A QUALIFIED PROFESSIONAL ENGINEER. DETAIL FABRICATION, INCLUDING ANCHORAGES AND ATTACHMENTS TO STRUCTURE AND TO SUPPORTED EQUIPMENT. INCLUDE BASE WEIGHTS.
4. WIRING DIAGRAMS: POWER, SIGNAL, AND CONTROL WIRING.

C. QUALIFICATION DATA: FOR MANUFACTURER.

D. CERTIFIED SUMMARY OF PROTOTYPE-UNIT TEST REPORT.

E. CERTIFIED TEST REPORTS: FOR COMPONENTS AND ACCESSORIES THAT ARE EQUIVALENT, BUT NOT IDENTICAL, TO THOSE TESTED ON PROTOTYPE UNIT.

F. CERTIFIED SUMMARY OF PERFORMANCE TESTS: DEMONSTRATE COMPLIANCE WITH SPECIFIED REQUIREMENT TO MEET PERFORMANCE CRITERIA FOR SENSITIVE LOADS.

G. TEST REPORTS:

1. REPORT OF FACTORY TEST ON UNITS TO BE SHIPPED FOR THIS PROJECT, SHOWING EVIDENCE OF COMPLIANCE WITH SPECIFIED REQUIREMENTS.
2. REPORT OF SOUND GENERATION.
3. FIELD QUALITY-CONTROL TEST REPORTS.

H. CERTIFICATION OF TORSIONAL VIBRATION COMPATIBILITY: COMPLY WITH NFPA 110.

I. OPERATION AND MAINTENANCE DATA: FOR PACKAGED ENGINE GENERATORS TO INCLUDE IN EMERGENCY, OPERATION, AND MAINTENANCE MANUALS. IN ADDITION, INCLUDE THE FOLLOWING:

1. LIST OF TOOLS AND REPLACEMENT ITEMS RECOMMENDED TO BE STORED AT THE PROJECT FOR READY ACCESS. INCLUDE PART AND DRAWING NUMBERS, CURRENT UNIT PRICES, AND SOURCE OF SUPPLY.

J. WARRANTY: SPECIAL WARRANTY SPECIFIED IN THIS SECTION.

1.5 QUALITY ASSURANCE

A. INSTALLER QUALIFICATIONS: MANUFACTURER'S AUTHORIZED REPRESENTATIVE WHO IS TRAINED AND APPROVED FOR INSTALLATION OF UNITS REQUIRED FOR THIS PROJECT.

1. MAINTENANCE PROXIMITY: NOT MORE THAN 4 HOURS' NORMAL TRAVEL TIME FROM INSTALLER'S PLACE OF BUSINESS TO PROJECT SITE.
2. ENGINEERING RESPONSIBILITY: PREPARATION OF DATA FOR VIBRATION ISOLATORS AND SEISMIC RESTRAINTS OF ENGINE SKID MOUNTS, INCLUDING SHOP DRAWINGS, BASED ON TESTING AND ENGINEERING ANALYSIS OF MANUFACTURER'S STANDARD UNITS IN ASSEMBLIES SIMILAR TO THOSE INDICATED FOR THIS PROJECT.

B. MANUFACTURER'S DISTRIBUTOR QUALIFICATIONS: A QUALIFIED SUPPLIER. MAINTAIN, WITHIN 100 MILES OF PROJECT SITE, A SERVICE CENTER CAPABLE OF PROVIDING TRAINING, PARTS, AND EMERGENCY MAINTENANCE REPAIRS. SERVICE CANNOT BE SUBLET TO ANOTHER SERVICE ORGANIZATION.

C. SOURCE LIMITATIONS: OBTAIN PACKAGED GENERATOR SETS AND AUXILIARY COMPONENTS THROUGH ONE SOURCE FROM A SINGLE MANUFACTURER.

D. COMPLY WITH NFPA 30 37A.

E. COMPLY WITH NFPA 70.

F. COMPLY WITH NFPA 99.

G. COMPLY WITH NFPA 110 REQUIREMENTS FOR EMERGENCY POWER SUPPLY SYSTEM.

H. ENGINE EXHAUST EMISSIONS: COMPLY WITH APPLICABLE STATE AND LOCAL GOVERNMENT REQUIREMENTS.

I. NOISE EMISSION: COMPLY WITH APPLICABLE STATE AND LOCAL GOVERNMENT REQUIREMENTS FOR MAXIMUM NOISE LEVEL AT ADJACENT PROPERTY BOUNDARIES DUE TO SOUND EMITTED BY GENERATOR SET INCLUDING ENGINE, ENGINE EXHAUST, ENGINE COOLING-AIR INTAKE AND DISCHARGE, AND OTHER COMPONENTS OF INSTALLATION.

J. FUEL CONTAINMENT. COMPLY WITH APPLICABLE STATE AND LOCAL REQUIREMENTS.

1.6 COORDINATION

A. COORDINATE SIZE AND LOCATION OF CONCRETE BASES. CAST ANCHOR-BOLT INSERTS INTO BASES. CONCRETE, REINFORCEMENT, AND FORMWORK REQUIREMENTS ARE SPECIFIED IN DIVISION 3.

1.7 WARRANTY

A. SPECIAL WARRANTY: MANUFACTURER'S STANDARD FORM IN WHICH MANUFACTURER AGREES TO REPAIR OR REPLACE COMPONENTS OF PACKAGED ENGINE GENERATORS AND ASSOCIATED AUXILIARY COMPONENTS THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN SPECIFIED WARRANTY PERIOD.

1. WARRANTY PERIOD: FIVE YEARS FROM DATE OF SUBSTANTIAL COMPLETION.

1.8 MAINTENANCE SERVICE

A. INITIAL MAINTENANCE SERVICE: BEGINNING AT SUBSTANTIAL COMPLETION, PROVIDE 24 MONTHS' FULL MAINTENANCE BY SKILLED EMPLOYEES OF MANUFACTURER'S DESIGNATED SERVICE ORGANIZATION. INCLUDE QUARTERLY EXERCISING TO CHECK FOR PROPER STARTING, LOAD TRANSFER, AND RUNNING UNDER LOAD. INCLUDE ROUTINE PREVENTIVE MAINTENANCE AS RECOMMENDED BY MANUFACTURER AND ADJUSTING AS REQUIRED FOR PROPER OPERATION. MAINTENANCE AGREEMENTS SHALL INCLUDE PARTS AND SUPPLIES AS USED IN MANUFACTURE AND INSTALLATION OF ORIGINAL EQUIPMENT.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:

1. CATERPILLAR; ENGINE DIV.
2. KOHLER CO; GENERATOR DIVISION.
3. ONAN CORP./CUMMINS POWER GENERATION; INDUSTRIAL BUSINESS GROUP.
4. GENERAC GENERATORS
5. TAYLOR POWER SYSTEMS

2.2 ENGINE-GENERATOR SET

A. PACKAGED ENGINE-GENERATOR SET SHALL BE A COORDINATED ASSEMBLY OF COMPATIBLE COMPONENTS.

B. POWER OUTPUT RATINGS: NOMINAL RATINGS AS INDICATED, WITH CAPACITY AS REQUIRED TO OPERATE AS A UNIT AS EVIDENCED BY RECORDS OF PROTOTYPE TESTING.

C. OUTPUT CONNECTIONS: THREE PHASE, FOUR WIRE.

D. SAFETY STANDARD: COMPLY WITH ASME B15.1.

E. NAMEPLATES: EACH MAJOR SYSTEM COMPONENT SHALL BE EQUIPPED WITH A NAMEPLATE TO IDENTIFY MANUFACTURER'S NAME AND ADDRESS, AND MODEL AND SERIAL NUMBER OF COMPONENTS.

F. MOUNTING FRAME: ADEQUATE STRENGTH AND RIGIDITY TO MAINTAIN ALIGNMENT OF MOUNTED COMPONENTS WITHOUT DEPENDING ON CONCRETE FOUNDATION. MOUNTING FRAME SHALL BE FREE FROM SHARP EDGES AND CORNERS AND SHALL HAVE LIFTING ATTACHMENTS ARRANGED FOR LIFTING WITH SLINGS WITHOUT DAMAGING COMPONENTS.

1. RIGGING DIAGRAM: INSCRIBED ON METAL PLATE PERMANENTLY ATTACHED TO MOUNTING FRAME TO INDICATE LOCATION AND LIFTING CAPACITY OF EACH LIFTING ATTACHMENT AND GENERATOR-SET CENTER OF GRAVITY.

2.3 GENERATOR-SET PERFORMANCE

A. OVER SIZING GENERATOR COMPARED WITH THE RATED POWER OUTPUT OF THE ENGINE IS PERMISSIBLE TO MEET SPECIFIED PERFORMANCE.

1. NAMEPLATE DATA FOR OVERSIZED GENERATOR: SHOW RATINGS REQUIRED BY THE CONTRACT DOCUMENTS RATHER THAN RATINGS THAT WOULD NORMALLY BE APPLIED TO GENERATOR SIZE INSTALLED.
2. GENERATOR TEMPERATURE SHALL BE CLASS F OR CLASS B. MINIMUM RATINGS SHALL BE 90 DEGREE C LLOYDS, 95 DEGREE C ABS, 105 DEGREE C CONTINUOUS, 130 DEGREE C STANDBY (RISE BY RESISTANCE METHOD, MIL-STD-705, METHOD 680.1B).

B. STEADY-STATE VOLTAGE OPERATIONAL BANDWIDTH: 1 PERCENT OF RATED OUTPUT VOLTAGE FROM NO LOAD TO FULL LOAD.

C. STEADY-STATE VOLTAGE MODULATION FREQUENCY: LESS THAN 1 HZ.

D. TRANSIENT VOLTAGE PERFORMANCE: NOT MORE THAN 10 PERCENT VARIATION FOR 50 PERCENT STEP-LOAD INCREASE OR DECREASE. VOLTAGE SHALL RECOVER AND REMAIN WITHIN THE STEADY-STATE OPERATING BAND WITHIN 3 SECONDS.

E. STEADY-STATE FREQUENCY OPERATIONAL BANDWIDTH: PLUS OR MINUS 0.25 PERCENT OF RATED FREQUENCY FROM NO LOAD TO FULL LOAD.

F. STEADY-STATE FREQUENCY STABILITY: WHEN SYSTEM IS OPERATING AT ANY CONSTANT LOAD WITHIN THE RATED LOAD, THERE SHALL BE NO RANDOM SPEED VARIATIONS OUTSIDE THE STEADY-STATE OPERATIONAL BAND AND NO HUNTING OR SURGING OF SPEED.

G. TRANSIENT FREQUENCY PERFORMANCE: LESS THAN 2-HZ VARIATION FOR A 50 PERCENT STEP-LOAD INCREASE OR DECREASE. FREQUENCY SHALL RECOVER AND REMAIN WITHIN THE STEADY-STATE OPERATING BAND WITHIN THREE SECONDS.

H. OUTPUT WAVEFORM: AT NO LOAD, HARMONIC CONTENT MEASURED LINE TO NEUTRAL SHALL NOT EXCEED 2 PERCENT TOTAL WITH NO SLOT RIPPLE. THE TELEPHONE INFLUENCE FACTOR, DETERMINED ACCORDING TO NEMA MG 1, SHALL NOT EXCEED 50 PERCENT.

I. SUSTAINED SHORT-CIRCUIT CURRENT: FOR A 3-PHASE, BOLTED SHORT CIRCUIT AT SYSTEM OUTPUT TERMINALS, THE SYSTEM SHALL SUPPLY A MINIMUM OF 300 PERCENT OF RATED FULL-LOAD CURRENT FOR NOT LESS THAN 10 SECONDS AND THEN CLEAR THE FAULT AUTOMATICALLY, WITHOUT DAMAGE TO WINDING INSULATION OR OTHER GENERATOR SYSTEM COMPONENTS AND WITHOUT A CURRENT BOOST SYSTEM.

J. EXCITATION SYSTEM: PERFORMANCE SHALL BE UNAFFECTED BY VOLTAGE DISTORTION CAUSED BY NONLINEAR LOAD.

K. START TIME: COMPLY WITH NFPA 110, TYPE 10, SYSTEM REQUIREMENTS.

2.4 SERVICE CONDITIONS

A. ENVIRONMENTAL CONDITIONS: ENGINE-GENERATOR SYSTEM SHALL WITHSTAND THE FOLLOWING ENVIRONMENTAL CONDITIONS WITHOUT MECHANICAL OR ELECTRICAL DAMAGE OR DEGRADATION OF PERFORMANCE CAPABILITY:

1. AMBIENT TEMPERATURE: MINUS 15 TO PLUS 40 DEG C.
2. ALTITUDE: SEA LEVEL TO 500 FEET.

2.5 ENGINE

A. FUEL: FUEL OIL, GRADE DF-2.

B. RATED ENGINE SPEED: 1800 RPM.

C. MAXIMUM PISTON SPEED FOR FOUR-CYCLE ENGINES: 2250 FPM (11.4 M/S).

D. LUBRICATION SYSTEM: THE FOLLOWING ITEMS ARE MOUNTED ON ENGINE OR SKID:

1. FILTER AND STRAINER: RATED TO REMOVE 90 PERCENT OF PARTICLES 5 MICROMETERS AND SMALLER WHILE PASSING FULL FLOW.
2. THERMOSTATIC CONTROL VALVE: CONTROL FLOW IN SYSTEM TO MAINTAIN OPTIMUM OIL TEMPERATURE. UNIT SHALL BE CAPABLE OF FULL FLOW AND IS DESIGNED TO BE FAIL-SAFE.
3. CRANKCASE DRAIN: ARRANGED FOR COMPLETE GRAVITY DRAINAGE TO AN EASILY REMOVABLE CONTAINER WITH NO DISASSEMBLY AND WITHOUT USE OF PUMPS, SIPHONS, SPECIAL TOOLS, OR APPLIANCES.

E. ENGINE FUEL SYSTEM:

1. MAIN FUEL PUMP: MOUNTED ON ENGINE. PUMP ENSURES ADEQUATE PRIMARY FUEL FLOW UNDER STARTING AND LOAD CONDITIONS.
2. RELIEF-BYPASS VALVE: AUTOMATICALLY REGULATES PRESSURE IN FUEL LINE AND RETURNS EXCESS FUEL TO SOURCE.

F. COOLANT JACKET HEATER: ELECTRIC-IMMERSION TYPE, FACTORY INSTALLED IN COOLANT JACKET SYSTEM. COMPLY WITH NFPA 110 REQUIREMENTS FOR LEVEL 1 EQUIPMENT FOR HEATER CAPACITY.

G. GOVERNOR: ADJUSTABLE ISOCHRONOUS, WITH SPEED SENSING.

2.6 ENGINE COOLING SYSTEM

A. DESCRIPTION: CLOSED LOOP, LIQUID COOLED, WITH RADIATOR FACTORY MOUNTED ON ENGINE-GENERATOR-SET MOUNTING FRAME AND INTEGRAL ENGINE-DRIVEN COOLANT PUMP.

B. RADIATOR: RATED FOR SPECIFIED COOLANT.

C. COOLANT: SOLUTION OF 50 PERCENT ETHYLENE-GLYCOL-BASED ANTIFREEZE AND 50 PERCENT WATER, WITH ANTICORROSION ADDITIVES AS RECOMMENDED BY ENGINE MANUFACTURER.

D. TEMPERATURE CONTROL: SELF-CONTAINED, THERMOSTATIC-CONTROL VALVE MODULATES COOLANT FLOW AUTOMATICALLY TO MAINTAIN OPTIMUM CONSTANT COOLANT TEMPERATURE AS RECOMMENDED BY ENGINE MANUFACTURER.

E. COOLANT HOSE: FLEXIBLE ASSEMBLY WITH INSIDE SURFACE OF NONPOROUS RUBBER AND OUTER COVERING OF AGING-, ULTRAVIOLET-, AND ABRASION-RESISTANT FABRIC.

1. RATING: 50-PSIG (345-KPA) MAXIMUM WORKING PRESSURE WITH COOLANT AT 180 DEG F (82 DEG C), AND NOT COLLAPSIBLE UNDER VACUUM.
2. END FITTINGS: FLANGES OR STEEL PIPE NIPPLES WITH CLAMPS TO SUIT PIPING AND EQUIPMENT CONNECTIONS.

2.7 FUEL SUPPLY SYSTEM

A. COMPLY WITH NFPA 30.

B. BASE-MOUNTED FUEL OIL TANK: FACTORY INSTALLED AND PIPED, COMPLYING WITH ALL LOCAL, STATE AND FEDERAL GUIDELINES AND WITH UL 142 FUEL OIL TANK. FEATURES INCLUDE THE FOLLOWING:

1. TANK LEVEL INDICATOR.
2. DUAL WALL CONSTRUCTION WITH LEAK DETECTION.
3. CAPACITY: FUEL FOR 48 HOURS CONTINUOUS OPERATION AT 100 PERCENT RATED POWER OUTPUT.
4. VANDAL-RESISTANT FILL CAP WITH SPILL CONTAINMENT IN ACCORDANCE WITH ALL APPLICABLE CODES AND ORDINANCES.
5. CONTAINMENT PROVISIONS: COMPLY WITH REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.

2.8 ENGINE EXHAUST SYSTEM

A. MUFFLER: CRITICAL TYPE, SIZED AS RECOMMENDED BY ENGINE MANUFACTURER; SOUND LEVEL MEASURED AT A DISTANCE OF 10 FEET (3 M) FROM EXHAUST DISCHARGE SHALL BE 85 DBA OR LESS. MUFFLER SHALL BE MOUNTED INSIDE GENERATOR WEATHERPROOF HOUSING. SHALL BE MOUNTED SUCH THAT GENERATOR HOUSING CAN BE FULLY OPENED FOR MAINTENANCE.

B. CONDENSATE DRAIN FOR MUFFLER: SCHEDULE 40, BLACK STEEL PIPE CONNECTED TO MUFFLER DRAIN OUTLET THROUGH A PETCOCK.

C. CONNECTION FROM ENGINE TO EXHAUST SYSTEM: FLEXIBLE SECTION OF CORRUGATED STAINLESS-STEEL PIPE.

D. CONNECTION FROM EXHAUST PIPE TO MUFFLER: STAINLESS-STEEL EXPANSION JOINT WITH LINER.

E. EXHAUST PIPING EXTERNAL TO ENGINE: ASTM A 53/A 53M, SCHEDULE 40, WELDED, BLACK STEEL, WITH WELDED JOINTS AND FITTINGS AND EXTERIOR INSULATION.

F. RAIN CAP: RAIN CAP SHALL BE ALUMINUM OR STAINLESS STEEL AND SHALL PENETRATE THE TOP OF THE HOUSING AND CONTAIN NO ELBOWS OUTSIDE HOUSING.

G. INSULATION: FOR ALL INSTALLATIONS, THE EXHAUST SYSTEM SHALL BE FULLY INSULATED AS RECOMMENDED BY THE GENERATOR MANUFACTURER.

2.9 COMBUSTION-AIR INTAKE

A. DESCRIPTION: HEAVY-DUTY, ENGINE-MOUNTED AIR CLEANER WITH REPLACEABLE DRY-FILTER ELEMENT AND "BLOCKED FILTER" INDICATOR.

2.10 STARTING SYSTEM

A. DESCRIPTION: 12-V ELECTRIC, WITH NEGATIVE GROUND AND INCLUDING THE FOLLOWING ITEMS:

1. COMPONENTS: SIZED SO THEY WILL NOT BE DAMAGED DURING A FULL ENGINE-CRANKING CYCLE WITH AMBIENT TEMPERATURE AT MAXIMUM SPECIFIED IN "ENVIRONMENTAL CONDITIONS" PARAGRAPH IN "SERVICE CONDITIONS" ARTICLE.
2. CRANKING MOTOR: HEAVY-DUTY UNIT THAT AUTOMATICALLY ENGAGES AND RELEASES FROM ENGINE FLYWHEEL WITHOUT BINDING.
3. CRANKING CYCLE: AS REQUIRED BY NFPA 110 FOR SYSTEM LEVEL SPECIFIED.
4. BATTERY: ADEQUATE CAPACITY WITHIN AMBIENT TEMPERATURE RANGE SPECIFIED IN "ENVIRONMENTAL CONDITIONS" PARAGRAPH IN "SERVICE CONDITIONS" ARTICLE TO PROVIDE SPECIFIED CRANKING CYCLE AT LEAST TWICE WITHOUT RECHARGING.
5. BATTERY CABLE: SIZE AS RECOMMENDED BY ENGINE MANUFACTURER FOR CABLE LENGTH INDICATED. INCLUDE REQUIRED INTERCONNECTING CONDUCTORS AND CONNECTION ACCESSORIES.
6. BATTERY COMPARTMENT: FACTORY FABRICATED OF METAL WITH ACID-RESISTANT FINISH AND THERMAL INSULATION. INCLUDE ACCESSORIES REQUIRED TO SUPPORT AND FASTEN BATTERIES IN PLACE.
7. BATTERY-CHARGING ALTERNATOR: FACTORY MOUNTED ON ENGINE WITH SOLID-STATE VOLTAGE REGULATION AND 35-A MINIMUM CONTINUOUS RATING.
8. BATTERY CHARGER: CURRENT-LIMITING, AUTOMATIC-EQUALIZING AND FLOAT-CHARGING TYPE. UNIT SHALL COMPLY WITH UL 1236 AND INCLUDE THE FOLLOWING FEATURES:
   a. OPERATION: EQUALIZING-CHARGING RATE OF 10 A SHALL BE INITIATED AUTOMATICALLY AFTER BATTERY HAS LOST CHARGE UNTIL AN ADJUSTABLE EQUALIZING VOLTAGE IS ACHIEVED AT BATTERY TERMINALS. UNIT SHALL THEN BE AUTOMATICALLY SWITCHED TO A LOWER FLOAT-CHARGING MODE AND SHALL CONTINUE TO OPERATE IN THAT MODE UNTIL BATTERY IS DISCHARGED AGAIN.
   b. AUTOMATIC TEMPERATURE COMPENSATION: ADJUST FLOAT AND EQUALIZE VOLTAGES FOR VARIATIONS IN AMBIENT TEMPERATURE FROM MINUS 40 DEG C TO PLUS 60 DEG C TO PREVENT OVERCHARGING AT HIGH TEMPERATURES AND UNDERCHARGING AT LOW TEMPERATURES.
   c. AUTOMATIC VOLTAGE REGULATION: MAINTAIN CONSTANT OUTPUT VOLTAGE REGARDLESS OF INPUT VOLTAGE VARIATIONS UP TO PLUS OR MINUS 10 PERCENT.
   d. AMMETER AND VOLTMETER: FLUSH MOUNTED IN DOOR. METERS SHALL INDICATE CHARGING RATES.
   e. SAFETY FUNCTIONS: SENSE ABNORMALLY LOW BATTERY VOLTAGE AND CLOSE CONTACTS PROVIDING LOW BATTERY VOLTAGE INDICATION ON CONTROL AND MONITORING PANEL. SENSE HIGH BATTERY VOLTAGE AND LOSS OF AC INPUT OR DC OUTPUT OF BATTERY CHARGER. EITHER CONDITION SHALL CLOSE CONTACTS THAT PROVIDE A BATTERY-CHARGER MALFUNCTION INDICATION AT SYSTEM CONTROL AND MONITORING PANEL.
   f. ENCLOSURE AND MOUNTING: NEMA 250, TYPE 1, WALL-MOUNTED CABINET.

2.11 CONTROL AND MONITORING

A. FUNCTIONAL DESCRIPTION: WHEN MODE-SELECTOR SWITCH ON THE CONTROL AND MONITORING PANEL IS IN THE AUTOMATIC POSITION, REMOTE-CONTROL CONTACTS IN ONE OR MORE SEPARATE AUTOMATIC TRANSFER SWITCHES INITIATE STARTING AND STOPPING OF THE GENERATOR SET. WHEN MODE-SELECTOR SWITCH IS SWITCHED TO THE ON POSITION, THE GENERATOR SET STARTS. THE OFF POSITION OF THE SAME SWITCH INITIATES GENERATOR-SET SHUTDOWN. WHEN GENERATOR SET IS RUNNING, SPECIFIED SYSTEM OR EQUIPMENT FAILURES OR DERANGEMENTS AUTOMATICALLY SHUT DOWN THE GENERATOR SET AND INITIATE ALARMS. OPERATION OF A REMOTE EMERGENCY-STOP SWITCH ALSO SHUTS DOWN THE GENERATOR SET. CONTROL SYSTEM SHALL BE MICROPROCESSOR BASED.

B. CONFIGURATION: OPERATING AND SAFETY INDICATIONS, PROTECTIVE DEVICES, BASIC SYSTEM CONTROLS, AND ENGINE GAGES SHALL BE GROUPED IN A COMMON CONTROL AND MONITORING PANEL MOUNTED ON THE GENERATOR SET. MOUNTING METHOD SHALL ISOLATE THE CONTROL PANEL FROM GENERATOR-SET VIBRATION.

C. INDICATING AND PROTECTIVE DEVICES AND CONTROLS SHALL INCLUDE THOSE REQUIRED BY NFPA 110, AND THE FOLLOWING:

D: INDICATING AND PROTECTIVE DEVICES AND CONTROLS:

1. AC VOLTMETER.
2. AC AMMETER.
3. AC FREQUENCY METER.
4. DC VOLTMETER (ALTERNATOR BATTERY CHARGING).
5. ENGINE-COOLANT TEMPERATURE GAGE.
6. ENGINE LUBRICATING-OIL PRESSURE GAGE.
7. RUNNING-TIME METER.
8. AMMETER-VOLTMETER, PHASE-SELECTOR SWITCH(ES).
9. GENERATOR-VOLTAGE ADJUSTING RHEOSTAT.
10. START-STOP SWITCH.
11. OVERSPEED SHUTDOWN DEVICE.
12. COOLANT HIGH-TEMPERATURE SHUTDOWN DEVICE.
13. COOLANT LOW-LEVEL SHUTDOWN DEVICE.
14. OIL LOW-PRESSURE SHUTDOWN DEVICE.
15. FUEL TANK DERANGEMENT ALARM.
16. FUEL TANK HIGH-LEVEL SHUTDOWN OF FUEL SUPPLY ALARM.

E. SUPPORTING ITEMS: INCLUDE SENSORS, TRANSDUCERS, TERMINALS, RELAYS, AND OTHER DEVICES AND INCLUDE WIRING REQUIRED TO SUPPORT SPECIFIED ITEMS. LOCATE SENSORS AND OTHER SUPPORTING ITEMS ON ENGINE OR GENERATOR, UNLESS OTHERWISE INDICATED.

F. CONNECTION TO DATA LINK: A SEPARATE TERMINAL BLOCK, FACTORY WIRED TO FORM C DRY CONTACTS, FOR EACH ALARM AND STATUS INDICATION IS RESERVED FOR CONNECTIONS FOR DATA-LINK TRANSMISSION OF INDICATIONS TO REMOTE DATA TERMINALS. DATA SYSTEM CONNECTIONS TO TERMINALS ARE COVERED IN DIVISION 16 SECTION "ELECTRICAL POWER MONITORING AND CONTROL."

G. COMMON REMOTE AUDIBLE ALARM: SIGNAL THE OCCURRENCE OF ANY EVENTS LISTED BELOW WITHOUT DIFFERENTIATING BETWEEN EVENT TYPES. CONNECT SO THAT AFTER AN ALARM IS SILENCED, CLEARING OF INITIATING CONDITION WILL REACTIVATE ALARM UNTIL SILENCING SWITCH IS RESET.

1. ENGINE HIGH-TEMPERATURE SHUTDOWN.
2. LUBE-OIL LOW-PRESSURE SHUTDOWN.
3. OVER SPEED SHUTDOWN.
4. REMOTE EMERGENCY-STOP SHUTDOWN.
5. ENGINE HIGH-TEMPERATURE PREALARM.
6. LUBE-OIL LOW-PRESSURE PREALARM.
7. FUEL TANK, LOW-FUEL LEVEL.
8. LOW COOLANT LEVEL.
9. OVER CRANK SHUTDOWN.
10. COOLANT LOW-TEMPERATURE ALARM.
11. CONTROL SWITCH NOT IN AUTO POSITION.
12. BATTERY-CHARGER MALFUNCTION ALARM.
13. BATTERY LOW-VOLTAGE ALARM.

H. REMOTE ALARM ANNUNCIATOR: COMPLY WITH NFPA 99. LABELED LED SHALL IDENTIFY EACH ALARM EVENT. COMMON AUDIBLE SIGNAL SHALL SOUND FOR ALARM CONDITIONS. SILENCING SWITCH IN FACE OF PANEL SHALL SILENCE SIGNAL WITHOUT ALTERING VISUAL INDICATION. CONNECT SO THAT AFTER AN ALARM IS SILENCED, CLEARING OF INITIATING CONDITION WILL REACTIVATE ALARM UNTIL SILENCING SWITCH IS RESET. CABINET AND FACEPLATE ARE SURFACE- OR FLUSH-MOUNTING TYPE TO SUIT MOUNTING CONDITIONS INDICATED.

I. REMOTE EMERGENCY-STOP SWITCH: FLUSH; WALL MOUNTED, UNLESS OTHERWISE INDICATED; AND LABELED. PUSH BUTTON SHALL BE PROTECTED FROM ACCIDENTAL OPERATION. INSTALL AS INDICATED ON THE DRAWINGS OR ENGINEER APPROVED LOCATION.

2.12 GENERATOR OVERCURRENT AND FAULT PROTECTION

A. GENERATOR CIRCUIT BREAKER: MOLDED-CASE, THERMAL-MAGNETIC TYPE; 100 PERCENT RATED; COMPLYING WITH NEMA AB 1 AND UL 489.

1. TRIPPING CHARACTERISTIC: DESIGNED SPECIFICALLY FOR GENERATOR PROTECTION. PROVIDE CIRCUIT BREAKER SETTINGS TO COORDINATE WITH GENERATOR DAMAGE CHARACTERISTICS.
2. TRIP RATING: MATCHED TO GENERATOR RATING.
3. SHUNT TRIP: CONNECTED TO TRIP BREAKER WHEN GENERATOR SET IS SHUT DOWN BY OTHER PROTECTIVE DEVICES.
4. MOUNTING: ADJACENT TO OR INTEGRATED WITH CONTROL AND MONITORING PANEL.

B. GROUND-FAULT INDICATION (WHERE INDICATED ON DRAWINGS): COMPLY WITH NFPA 70, ARTICLE 700-7(D). INTEGRATE GROUND-FAULT ALARM INDICATION WITH OTHER GENERATOR-SET ALARM INDICATIONS.

2.13 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

A. COMPLY WITH NEMA MG 1 AND SPECIFIED PERFORMANCE REQUIREMENTS.

B. DRIVE: GENERATOR SHAFT SHALL BE DIRECTLY CONNECTED TO ENGINE SHAFT. EXCITER SHALL BE ROTATED INTEGRALLY WITH GENERATOR ROTOR.

C. ELECTRICAL INSULATION: CLASS F.

D. STATOR-WINDING LEADS: BROUGHT OUT TO TERMINAL BOX TO PERMIT FUTURE RECONNECTION FOR OTHER VOLTAGES IF REQUIRED.

E. CONSTRUCTION SHALL PREVENT MECHANICAL, ELECTRICAL, AND THERMAL DAMAGE DUE TO VIBRATION, OVER SPEED UP TO 125 PERCENT OF RATING, AND HEAT DURING OPERATION AT 110 PERCENT OF RATED CAPACITY.

F. EXCITATION SHALL USE NO SLIP OR COLLECTOR RINGS, OR BRUSHES, AND SHALL BE ARRANGED TO SUSTAIN GENERATOR OUTPUT UNDER SHORT-CIRCUIT CONDITIONS AS SPECIFIED.

G. ENCLOSURE: DRIP PROOF.

H. INSTRUMENT TRANSFORMERS: MOUNTED WITHIN GENERATOR ENCLOSURE.

I. VOLTAGE REGULATOR: SOLID-STATE TYPE, SEPARATE FROM EXCITER, PROVIDING PERFORMANCE AS SPECIFIED.

1. ADJUSTING RHEOSTAT ON CONTROL AND MONITORING PANEL SHALL PROVIDE PLUS OR MINUS 5 PERCENT ADJUSTMENT OF OUTPUT-VOLTAGE OPERATING BAND. ISOLATED FROM LOAD TO PREVENT TRACKING.

J. STRIP HEATER: THERMOSTATICALLY CONTROLLED UNIT ARRANGED TO MAINTAIN STATOR WINDINGS ABOVE DEW POINT.

K. WINDINGS: TWO-THIRDS PITCH STATOR WINDING AND FULLY LINKED AMORTISSEUR WINDING. DIPPED AND BAKED, HARMONIC DISTORTION NOT TO EXCEED 5% TOTAL RMS LINE TO LINE.

L. SUBTRANSIENT REACTANCE: 12 PERCENT, MAXIMUM.

2.14 OUTDOOR GENERATOR-SET ENCLOSURE

A. DESCRIPTION: VANDAL-RESISTANT, WEATHERPROOF PAINTED GALVANIZED STEEL HOUSING, WIND RESISTANT UP TO 150 MPH. MULTIPLE PANELS SHALL BE LOCKABLE AND PROVIDE ADEQUATE ACCESS TO COMPONENTS REQUIRING MAINTENANCE. PANELS SHALL BE REMOVABLE BY ONE PERSON WITHOUT TOOLS. INSTRUMENTS AND CONTROL SHALL BE MOUNTED WITHIN ENCLOSURE. ALL HARDWARE AND SCREWS SHALL BE STAINLESS STEEL.

B. ENGINE COOLING AIRFLOW THROUGH ENCLOSURE: MAINTAIN TEMPERATURE RISE OF SYSTEM COMPONENTS WITHIN REQUIRED LIMITS WHEN UNIT OPERATES AT 110 PERCENT OF RATED LOAD FOR 2 HOURS WITH AMBIENT TEMPERATURE AT TOP OF RANGE SPECIFIED IN SYSTEM SERVICE CONDITIONS.

1. LOUVERS: FIXED-ENGINE COOLING-AIR INLET AND DISCHARGE. STORM-PROOF AND DRAINABLE LOUVERS PREVENT ENTRY OF RAIN AND SNOW.

2.15 FINISHES

A. INDOOR AND OUTDOOR ENCLOSURES AND COMPONENTS: MANUFACTURER'S ELECTROSTATICALLY APPLIED POWDER COAT OVER CORROSION-RESISTANT PRETREATMENT AND COMPATIBLE STANDARD PRIMER.

2.16 SOURCE QUALITY CONTROL

A. PROTOTYPE TESTING: FACTORY TEST ENGINE-GENERATOR SET USING SAME ENGINE MODEL, CONSTRUCTED OF IDENTICAL OR EQUIVALENT COMPONENTS AND EQUIPPED WITH IDENTICAL OR EQUIVALENT ACCESSORIES.

1. TESTS: COMPLY WITH NFPA 110, LEVEL 1 ENERGY CONVERTERS IN PARAGRAPHS 3.2.1, 3.2.1.1, AND 3.2.1.2.
2. GENERATOR TESTS: COMPLY WITH IEEE 115.
3. COMPONENTS AND ACCESSORIES: ITEMS FURNISHED WITH INSTALLED UNIT THAT ARE NOT IDENTICAL TO THOSE ON TESTED PROTOTYPE SHALL HAVE BEEN FACTORY TESTED TO DEMONSTRATE COMPATIBILITY AND RELIABILITY.

B. PROJECT-SPECIFIC EQUIPMENT TESTS: BEFORE SHIPMENT, FACTORY TEST ENGINE-GENERATOR SET AND OTHER SYSTEM COMPONENTS AND ACCESSORIES MANUFACTURED SPECIFICALLY FOR THIS PROJECT. PERFORM TESTS AT RATED LOAD AND POWER FACTOR. INCLUDE THE FOLLOWING TESTS:

1. FULL LOAD RUN.
2. MAXIMUM POWER.
3. VOLTAGE REGULATION.
4. TRANSIENT AND STEADY-STATE GOVERNING.
5. SINGLE-STEP LOAD PICKUP.
6. SAFETY SHUTDOWN.

C. REPORT FACTORY TEST RESULTS WITHIN 10 DAYS OF COMPLETION OF TEST.

PART 3 - EXECUTION

3.1 EXAMINATION

A. EXAMINE AREAS, EQUIPMENT BASES, AND CONDITIONS, WITH INSTALLER PRESENT, FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION AND OTHER CONDITIONS AFFECTING PACKAGED ENGINE-GENERATOR PERFORMANCE.

B. EXAMINE ROUGHING-IN OF PIPING SYSTEMS AND ELECTRICAL CONNECTIONS. VERIFY ACTUAL LOCATIONS OF CONNECTIONS BEFORE PACKAGED ENGINE-GENERATOR INSTALLATION.

C. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

3.2 CONCRETE BASES

A. COORDINATE SIZE AND LOCATION OF CONCRETE BASES. SHALL BE 12" THICK, EXCEEDING GENSET FOOTPRINT BY 12" ON ALL SIDES AND BE 8" HIGHER THAN GRADE LEVEL. PROVIDE REBAR REINFORCEMENT, #5 ON 12" CENTERS ON TOP AND BOTTOM. PROVIDE A GROUND STRAP FROM REBAR, #1/0 COPPER.

B. PROVIDE A COUNTERPOISE GROUND LOOP AROUND THE CONCRETE PAD. GROUND LOOP SHALL BE #1/0 COPPER, 12" BELOW GRADE. PROVIDE FOUR DRIVEN GROUND RODS ON THE CORNERS OF THE COUNTERPOISE LOOP. GROUND RODS SHALL BE COPPER CLAD ¾" X 20'. BOND PAD REBAR WITH COUNTERPOISE LOOP. PROVIDE A #1/0 COPPER LEAD TO THE GENERATOR GROUNDING PAD.

3.3 INSTALLATION

A. COMPLY WITH PACKAGED ENGINE-GENERATOR MANUFACTURERS' WRITTEN INSTALLATION AND ALIGNMENT INSTRUCTIONS AND WITH NFPA 110.

B. INSTALL PACKAGED ENGINE GENERATORS LEVEL ON CONCRETE BASE.

1. VIBRATION ISOLATION: MOUNT PACKAGED ENGINE GENERATORS ON RESTRAINED SPRING ISOLATORS OR INTERNAL VIBRATION ISOLATORS.

C. INSTALL PACKAGED ENGINE GENERATOR TO PROVIDE ACCESS, WITHOUT REMOVING CONNECTIONS OR ACCESSORIES, FOR PERIODIC MAINTENANCE.

D. INSTALL EXHAUST-SYSTEM PIPING. EXTEND TO POINT OF TERMINATION OUTSIDE STRUCTURE. SIZE PIPING ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.

1. INSTALL CONDENSATE DRAIN PIPING FOR ENGINE EXHAUST SYSTEM. EXTEND DRAIN PIPING FROM LOW POINTS OF EXHAUST SYSTEM AND FROM MUFFLER TO CONDENSATE TRAPS AND TO POINT OF DISPOSITION.
2. SUPPORT EXHAUST PIPING AND MUFFLER WITH PIPE HANGERS SPACED A MAXIMUM OF 20 FEET (6 M) HORIZONTALLY AND AT EACH FLOOR VERTICALLY. PIPE HANGERS ARE SPECIFIED IN DIVISION 15 SECTION "HANGERS AND SUPPORTS."
3. RESTRAIN EXHAUST PIPING AND MUFFLERS WITH CABLE-TYPE BRACING ASSEMBLIES. CABLE-TYPE BRACING ASSEMBLIES ARE SPECIFIED IN DIVISION 16 SECTION "SEISMIC CONTROLS FOR ELECTRICAL WORK."
4. ALL EXHAUST PIPING AND MUFFLER WITHIN THE BUILDING SHALL BE INSULATED BY MANUFACTURER APPROVED INSULATION SYSTEM.
5. PROVIDE A MANUFACTURER APPROVED RAIN CAP ON THE END OF THE EXHAUST PIPING.
6. PROVIDE APPROVED BUILDING SLEEVE WHERE EXHAUST EXITS THE BUILDING. SLEEVE SHALL BE WEATHERPROOF.

E. ELECTRICAL WIRING: INSTALL ELECTRICAL DEVICES FURNISHED BY EQUIPMENT MANUFACTURERS BUT NOT SPECIFIED TO BE FACTORY MOUNTED.

3.4 CONNECTIONS

A. DRAWINGS INDICATE GENERAL ARRANGEMENT OF PIPING AND SPECIALTIES. THE FOLLOWING ARE SPECIFIC CONNECTION REQUIREMENTS:

1. INSTALL FUEL, COOLING-SYSTEM, AND EXHAUST-SYSTEM PIPING ADJACENT TO PACKAGED ENGINE GENERATOR TO ALLOW SERVICE AND MAINTENANCE.
2. CONNECT COOLING-SYSTEM WATER SUPPLY AND DRAIN PIPING TO DIESEL-ENGINE HEAT EXCHANGERS. INSTALL FLEXIBLE CONNECTORS AT CONNECTIONS TO ENGINE GENERATOR AND REMOTE RADIATOR.
3. CONNECT FUEL PIPING TO ENGINES WITH A GATE VALVE AND UNION.
   a. DIESEL STORAGE TANKS, TANK ACCESSORIES, PIPING, VALVES, AND SPECIALTIES FOR FUEL SYSTEMS OUTSIDE THE BUILDING ARE SPECIFIED IN DIVISION 2 SECTION "FUEL OIL DISTRIBUTION."
   b. DIESEL FUEL PIPING, VALVES, AND SPECIALTIES INSIDE THE BUILDING ARE SPECIFIED IN DIVISION 15 SECTION "FUEL OIL PIPING."
   c. NATURAL- AND LP-GAS PIPING, VALVES, AND SPECIALTIES FOR GAS DISTRIBUTION OUTSIDE THE BUILDING ARE SPECIFIED IN DIVISION 2 SECTION "NATURAL GAS DISTRIBUTION."
   d. NATURAL- AND LP-GAS PIPING, VALVES, AND SPECIALTIES FOR GAS PIPING INSIDE THE BUILDING ARE SPECIFIED IN DIVISION 15 SECTION "FUEL GAS PIPING."
4. CONNECT EXHAUST-SYSTEM PIPING TO ENGINES.

B. GROUND EQUIPMENT ACCORDING TO DIVISION 16 SECTION "GROUNDING AND BONDING." GENERATOR SHALL BE CONFIGURED AS A "SEPARATELY DERIVED ELECTRICAL SYSTEM" BY BONDING THE NEUTRAL AND GROUND AT THE GENERATOR.

C. CONNECT WIRING ACCORDING TO DIVISION 16 SECTION "CONDUCTORS AND CABLES."

D. TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 486A.

3.5 IDENTIFICATION

A. IDENTIFY SYSTEM COMPONENTS ACCORDING TO DIVISION 16 SECTION "BASIC ELECTRICAL MATERIALS AND METHODS."

3.6 FIELD QUALITY CONTROL

A. MANUFACTURER'S FIELD SERVICE: ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO INSPECT, TEST, AND ADJUST FIELD-ASSEMBLED COMPONENTS AND EQUIPMENT INSTALLATION, INCLUDING CONNECTIONS, AND TO ASSIST IN FIELD TESTING. REPORT RESULTS IN WRITING.

B. PERFORM THE FOLLOWING FIELD TESTS AND INSPECTIONS AND PREPARE TEST REPORTS:

1. PERFORM EACH ELECTRICAL TEST AND VISUAL AND MECHANICAL INSPECTION STATED IN NETA ATS, SECTIONS 7.15.2.1 AND 7.22.1 (EXCEPT FOR VIBRATION BASELINE TEST). CERTIFY COMPLIANCE WITH TEST PARAMETERS.

2. PERFORM TESTS RECOMMENDED BY MANUFACTURER.

3. NFPA 110 ACCEPTANCE TESTS: PERFORM TESTS REQUIRED BY NFPA 110 THAT ARE ADDITIONAL TO THOSE SPECIFIED HERE INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

a. SINGLE-STEP FULL-LOAD PICKUP TEST.

4. BATTERY TESTS: EQUALIZE CHARGING OF BATTERY CELLS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. RECORD INDIVIDUAL CELL VOLTAGES.

a. MEASURE CHARGING VOLTAGE AND VOLTAGES BETWEEN AVAILABLE BATTERY TERMINALS FOR FULL-CHARGING AND FLOAT-CHARGING CONDITIONS. CHECK ELECTROLYTE LEVEL AND SPECIFIC GRAVITY UNDER BOTH CONDITIONS.

b. TEST FOR CONTACT INTEGRITY OF ALL CONNECTORS. PERFORM AN INTEGRITY LOAD TEST AND A CAPACITY LOAD TEST FOR THE BATTERY.

c. VERIFY ACCEPTANCE OF CHARGE FOR EACH ELEMENT OF THE BATTERY AFTER DISCHARGE.

d. VERIFY THAT MEASUREMENTS ARE WITHIN MANUFACTURER'S SPECIFICATIONS.

5. BATTERY-CHARGER TESTS: VERIFY SPECIFIED RATES OF CHARGE FOR BOTH EQUALIZING AND FLOAT-CHARGING CONDITIONS.

6. SYSTEM INTEGRITY TESTS: METHODICALLY VERIFY PROPER INSTALLATION, CONNECTION, AND INTEGRITY OF EACH ELEMENT OF ENGINE-GENERATOR SYSTEM BEFORE AND DURING SYSTEM OPERATION. CHECK FOR AIR, EXHAUST, AND FLUID LEAKS.

C. COORDINATE TESTS WITH TESTS FOR TRANSFER SWITCHES AND RUN THEM CONCURRENTLY.

D. TEST INSTRUMENTS SHALL HAVE BEEN CALIBRATED WITHIN THE LAST 12 MONTHS, TRACEABLE TO STANDARDS OF THE NATIONAL INSTITUTE FOR STANDARDS AND TECHNOLOGY, AND ADEQUATE FOR MAKING POSITIVE OBSERVATION OF TEST RESULTS. MAKE CALIBRATION RECORDS AVAILABLE FOR EXAMINATION ON REQUEST.

E. LEAK TEST: AFTER INSTALLATION, CHARGE SYSTEM AND TEST FOR LEAKS. REPAIR LEAKS AND RETEST UNTIL NO LEAKS EXIST.

F. OPERATIONAL TEST: AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO CONFIRM PROPER MOTOR ROTATION AND UNIT OPERATION.

G. TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND EQUIPMENT.

H. REMOVE AND REPLACE MALFUNCTIONING UNITS AND RETEST AS SPECIFIED ABOVE.

I. RETEST: CORRECT DEFICIENCIES IDENTIFIED BY TESTS AND OBSERVATIONS AND RETEST UNTIL SPECIFIED REQUIREMENTS ARE MET.

J. REPORT RESULTS OF TESTS AND INSPECTIONS IN WRITING. RECORD ADJUSTABLE RELAY SETTINGS AND MEASURED INSULATION RESISTANCES, TIME DELAYS, AND OTHER VALUES AND OBSERVATIONS. ATTACH A LABEL OR TAG TO EACH TESTED COMPONENT INDICATING SATISFACTORY COMPLETION OF TESTS.

3.7 STARTUP SERVICE

A. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO PERFORM STARTUP SERVICE.

B. INSPECT FIELD-ASSEMBLED COMPONENTS AND EQUIPMENT INSTALLATION, INCLUDING PIPING AND ELECTRICAL CONNECTIONS. REPORT RESULTS IN WRITING.

C. COMPLETE INSTALLATION AND STARTUP CHECKS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. PROVIDE TEST DOCUMENTATION TO ENGINEER.

D. PROVIDE A FULL FUEL TANK AT FINAL ACCEPTANCE. FUEL SHALL BE NEW AND RECEIPT SHALL BE PROVIDED IN CLOSE OUT DOCUMENTS. PROVIDE SUITABLE FUEL ADDITIVE, AS RECOMMENDED BY MANUFACTURER, TO PRESERVE FUEL. INCLUDE INFORMATION ON FUEL ADDITIVE IN CLOSE OUT DOCUMENTS.

3.8 DEMONSTRATION

A. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN PACKAGED ENGINE GENERATORS.

1. COORDINATE THIS TRAINING WITH THAT FOR TRANSFER SWITCHES.

B. FULLY DEMONSTRATE OPERATION, MAINTENANCE, AND EMERGENCY PROCEDURES WITH OWNER'S REPRESENTATIVE.

END OF SECTION

EXHIBIT 9

FIRE STATION #16
EMERGENCY GENERATOR & SERVICE MODIFICATIONS

FOR

the City of
Mobile, Alabama

FD-054-21

Mobile, Alabama

BY

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ALABAMA LICENSED No. 25105 PROFESSIONAL ENGINEER ANDREW W. MAURIN

5-11-2021

NUMBER	REVISION DESCRIPTION

FIRE STATION #16 - EMERGENCY GENERATOR & SERVICE MODIFICATIONS
MOBILE, ALABAMA

DESIGNED BY: TMM
DRAWN BY: TMM
CHECKED BY: AWM
DATE: 05-11-2021

SHEET TITLE: ELECTRICAL TITLE SHEET

SHEET: T-1.1

ELECTRICAL SPECIFICATIONS

1. GENERAL ELECTRICAL:
   - 1.1. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY FOR THE INSTALLATION OF A COMPLETE ELECTRICAL SYSTEM AS INDICATED WITHIN THESE DRAWINGS. ALL WORK SHALL BE INSTALLED IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES AND ORDINANCES AND WITH MANUFACTURER'S RECOMMENDATIONS.
   - 1.2. THE CONTRACTOR SHALL CAREFULLY EXAMINE THE ARCHITECTURAL, STRUCTURAL, ELECTRICAL AND MECHANICAL DRAWINGS PRIOR TO SUBMITTING HIS BID. THE CONTRACTOR WILL BE REQUIRED TO FURNISH, INSTALL AND CONNECT ALL ITEMS AS INDICATED ON THE DRAWINGS.
   - 1.3. THE ARCHITECT SHALL BE NOTIFIED OF ANY CONFLICTS, OR INTERFERENCES THAT OCCUR BETWEEN INDIVIDUAL DRAWINGS.
   - 1.4. ALL MATERIALS AND EQUIPMENT SHALL BE INSTALLED IN A NEAT, FIRST CLASS, WORKMANLIKE MANNER, TO THE APPROVAL OF THE ARCHITECT/ENGINEER AND GOVERNING AUTHORITIES.
   - 1.5. IN ADDITION TO THE MANUFACTURERS STANDARD GUARANTEES, THE CONTRACTOR SHALL GUARANTEE ALL MATERIALS, EQUIPMENT AND WORKMANSHIP AGAINST DEFECTS FOR ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE, AND SHALL CORRECT ANY DEFECTS AT NO ADDITIONAL COST TO THE OWNER. ALL LAMPS SHALL BE GUARANTEED FOR 30 DAYS AFTER ACCEPTANCE.
   - 1.6. PRIOR APPROVAL: PRIOR APPROVAL SHALL BE REQUIRED FOR ANY MANUFACTURER OTHER THAN THOSE LISTED FOR ALL SPECIFIED ITEMS IN THESE DRAWINGS. SUBMIT ALL REQUESTS FOR PRIOR APPROVAL 2 WEEKS PRIOR TO BID OPENING. ENGINEER'S APPROVAL WILL BE IN THE FORM OF AN ADDENDUM.

2. CODES & STANDARDS:
   - 2.1. INSTALLATION AND MATERIALS SHALL COMPLY WITH THE LATEST ADOPTED EDITION OF THE FOLLOWING CODES & STANDARDS:
     - 2.1.1. NATIONAL ELECTRICAL CODE.
     - 2.1.2. NFPA 72, NATIONAL FIRE PROTECTION CODE.
     - 2.1.3. INTERNATIONAL BUILDING CODE.
     - 2.1.4. INTERNATIONAL ENERGY CONSERVATION CODE.
     - 2.1.5. NFPA 101.
     - 2.1.6. ADA.
     - 2.1.7. ANSI.
     - 2.1.8. NEMA.
     - 2.1.9. OSHA.
     - 2.1.10. UL.

3. ALTERATIONS & ADDITIONS TO EXISTING WORK:
   - 3.1. PROVIDE ALL NECESSARY ADDITIONS AND ALTERATIONS TO EXISTING WORK AS REQUIRED TO PROVIDE AND MAINTAIN A COMPLETE AND PROPER ELECTRICAL INSTALLATION.
   - 3.2. AS NECESSARY, RELOCATE EXISTING ELECTRICAL WORK SO OTHER TRADES CAN PURSUE THEIR WORK.
   - 3.3. MAINTAIN POWER TO EXISTING PORTIONS OF BUILDINGS FED FROM OR THROUGH AREA IN SCOPE OF THIS CONTRACT.
   - 3.4. COORDINATE ALL REQUIRED OUTAGES WITH OWNER.

4. BASIC MATERIALS & METHODS:
   - 4.1. ALL POWER AND DISTRIBUTION CABLING SHALL BE COPPER TYPE THWN/THHN.
   - 4.2. ALL ELECTRICAL EQUIPMENT, DEVICES, ETC. LOCATED OUTDOORS SHALL BE WEATHERPROOF.
   - 4.3. CONDUIT ROUTINGS AND DEVICE/EQUIPMENT LOCATIONS SHOWN ARE DIAGRAMMATIC ONLY, CONTRACTOR SHALL FIELD ROUTE AND LOCATE AS REQUIRED. CONDUIT ROUTINGS SHALL BE PARALLEL OR PERPENDICULAR TO BUILDING LINES.
   - 4.4. COORDINATE ALL ELECTRICAL WORK WITH OTHER TRADES AND STRUCTURAL COMPONENTS.
   - 4.5. THE CONDUIT MATERIAL SHALL BE AS FOLLOWS:
     - 4.5.1. ABOVE GRADE SUBJECT TO PHYSICAL ABUSE - IMC.
   - 4.6. CONDUIT FITTINGS SHALL BE AS FOLLOWS:
     - 4.6.1. RGS - THREADED GALVANIZED STEEL.
     - 4.6.2. PVC - PVC APPROVED FOR THE USE.
   - 4.7. ALL SIDEWALKS AND PARKING LOT ASPHALT AREAS THAT ARE CUT DUE TO NEW ELECTRICAL SERVICES SHALL BE REPAIRED TO MATCH EXISTING.
   - 4.8. COORDINATE LOCATIONS OF ELECTRICAL EQUIPMENT, DEVICES, OUTLETS, FIXTURES, ETC., WITH ARCHITECTURAL PLANS, ELEVATIONS AND REFLECTED CEILING PLANS PRIOR TO ROUGH-IN WORK.

5. GROUNDING & BONDING:
   - 5.1. PROVIDE AN INSULATED EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS.
   - 5.2. GROUND RODS SHALL BE 3/4"X20' COPPERCLAD STEEL.
   - 5.3. BELOW GRADE CONNECTIONS SHALL BE EXOTHERMIC TYPE.
   - 5.4. ALL CABLES SHALL BE COPPER, ALL BOLTED CONNECTIONS SHALL BE BRONZE.
   - 5.5. WHERE AVAILABLE, BOND TO BUILDING STRUCTURAL STEEL, BUILDING FOUNDATION STEEL, METAL WATER SERVICE PIPING.
   - 5.6. PROVIDE THREE 20' GROUND RODS IN TRIANGLE ARRANGEMENT ON 20' CENTERS FOR MADE ELECTRODE SYSTEM. MEASURE RESISTANCE AND ENSURE <25 OHMS.

6. IDENTIFICATION:
   - 6.1. PROVIDE ENGRAVED 1"X3" PHENOLIC LABELS FOR ALL PANELBOARDS, SAFETY SWITCHES, TRANSFORMERS, CABINETS, ETC.

ABBREVIATIONS

A	AMPS	MCE	MAIN COMMUNICATIONS EQUIPMENT ROOM
AC	ABOVE COUNTER	MCM	THOUSAND CIRCULAR MILS
AF	AMP FRAME	MH	MANHOLE
AFF	ABOVE FINISHED FLOOR	MIN	MINIMUM
AFG	ABOVE FINISHED GRADE	MISC	MISCELLANEOUS
AHU	AIR HANDLING UNIT	MLO	MAIN LUGS ONLY
AL	ALUMINUM	MNT	MOUNTING HEIGHT
ARCH	ARCHITECT OR ARCHITECTURAL	MTG	MOUNTING
AT	AMP TRIP	MTS	MANUAL TRANSFER SWITCH
ATS	AUTOMATIC TRANSFER SWITCH	MV	MEDIUM VOLTAGE
ATU	AIR TERMINAL UNIT	N1	NEMA 1
AWG	AMERICAN WIRE GAUGE	N3R	NEMA 3R
BAS	BUILDING AUTOMATION SYSTEM	N/A	NOT APPLICABLE
BJ	BONDING JUMPER	NA	NOT APPLICABLE
BKR	CIRCUIT BREAKER	NEC	NATIONAL ELECTRICAL CODE
BLDG	BUILDING	NESC	NATIONAL ELECTRICAL SAFETY CODE
BOD	BASIS OF DESIGN	NEU	NEUTRAL
C	CONDUIT	OCPD	OVERCURRENT PROTECTION DEVICE
C/B	CIRCUIT BREAKER	OFOI	OWNER FURNISHED OWNER INSTALLED
CL	CURRENT LIMITING	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
C/L	CENTERLINE	OH	OVERHEAD
CLG	CEILING	OHE	OVERHEAD ELECTRIC
CKT	CIRCUIT	OHP	OVERHEAD PRIMARY
CT	CURRENT TRANSFORMER	OHS	OVERHEAD SECONDARY
CU	COPPER	PBD	PANELBOARD
DDC	DIRECT DIGITAL CONTROL	PF	POWER FACTOR
DEMO	DEMOLISH	PNL	PANELBOARD
DS	DISCONNECT SWITCH	PT	POTENTIAL TRANSFORMER
EC	ELECTRICAL CONTRACTOR	PWR	POWER
EGC	EQUIPMENT GROUNDING CONDUCTOR	RCPT	RECEPTACLE
ELEC	ELECTRICAL	REQD	REQUIRED
EMGB	ELECTRICAL MAIN GROUNDING BUSBAR	RM	ROOM
EF	EXHAUST FAN	RGS	RIGID GALVANIZED STEEL CONDUIT
EX	EXISTING TO REMAIN	RNC	RIGID NON-METALLIC CONDUIT
EXT	EXTERIOR	RVSS	REDUCED VOLTAGE SOLID STATE
EWC	ELECTRIC WATER COOLER	SA	SURGE ARRESTER
EMT	ELECTRICAL METALLIC TUBING	SCA	SHORT CIRCUIT AMPS
EQUIP	EQUIPMENT	SF	SUPPLY FAN
FMC	FLEXIBLE METAL CONDUIT	SPEC	SPECIFICATION
FACP	FIRE ALARM SYSTEM CONTROL PANEL	SWBD	SWITCHBOARD
FU	FUSE	SWGR	SWITCHGEAR
F/A	FIRE ALARM	TBB	TELECOMMUNICATIONS BONDING BACKBONE
FLA	FULL LOAD AMPS	TR	TELECOMMUNICATIONS ROOM
FLR	FLOOR	TGB	TELECOMMUNICATIONS GROUNDING BUSBAR
FVNR	FULL VOLTAGE NON-REVERSING	TMGB	TELECOMMUNICATIONS MAIN GROUNDING BUSBAR
GFI	GROUND FAULT INTERRUPTER	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
G	GROUND (OR GFI FOR RECEPTACLE SUBSCRIPT)	TYP	TYPICAL
GC	GENERAL CONTRACTOR	UFR	UNDERFLOOR RACEWAY
GND	GROUND	UG	UNDERGROUND
GEC	GROUNDING ELECTRODE CONDUCTOR	UGE	UNDERGROUND ELECTRIC
HH	HANDHOLE	UGP	UNDERGROUND PRIMARY
HOA	HAND-OFF-AUTOMATIC	UGS	UNDERGROUND SECONDARY
HP	HEAT PUMP OR HORSEPOWER	UL	UNDERWRITERS' LABORATORIES
HVAC	HEATING, VENTILATION & AIR-CONDITIONING	UNO	UNLESS NOTED OTHERWISE
IG	ISOLATED GROUND	UPS	UNINTERRUPTIBLE POWER SUPPLY
IMC	INTERMEDIATE METAL CONDUIT	V	VOLT
JB	JUNCTION BOX	VA	VOLT-AMPERES
k	KILO	VAR	VOLT-AMPERES REACTIVE
kAIC	KILO-AMPERE INTERRUPTING CAPABILITY	VAV	VARIABLE AIR VOLUME UNIT
kCMIL	THOUSAND CIRCULAR MILS	W	WATTS
LCP	LIGHTING CONTROL PANEL	WAO	WORK AREA OUTLET
LTG	LIGHTING	WP	WEATHERPROOF
LFMC	LIQUID TIGHT FLEXIBLE METAL CONDUIT	WSR	WITHSTAND RATING
LV	LOW VOLTAGE	XFMR	TRANSFORMER
MAX	MAXIMUM	XP	EXPLOSION PROOF
MCA	MINIMUM CIRCUIT AMPACITY	ϕ	PHASE
MCC	MOTOR CONTROL CENTER	72°	DEGREES
		Δ	DELTA
		Ω	OHMS

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5-11-2021

NUMBER	REVISION DESCRIPTION

FIRE STATION #16 - EMERGENCY GENERATOR & SERVICE MODIFICATIONS
MOBILE, ALABAMA

DESIGNED BY: TMM
DRAWN BY: TMM
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SHEET: E-1.1

SECTION 16201 - DIESEL GENERATOR SPECIFICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.

1.2 SUMMARY

A. THIS SECTION INCLUDES PACKAGED DIESEL ENGINE GENERATOR SETS WITH THE FOLLOWING FEATURES AND ACCESSORIES:

1. BATTERY CHARGER.
2. BASE MOUNTED FUEL TANK.
3. ENGINE-GENERATOR SET.
4. MUFFLER.
5. OUTDOOR ENCLOSURE.
6. REMOTE STOP SWITCH.
7. STARTING BATTERY.
8. BLOCK HEATER.

B. RELATED SECTIONS INCLUDE THE FOLLOWING:

1. DIVISION 16 SECTION "TRANSFER SWITCHES" FOR TRANSFER SWITCHES INCLUDING SENSORS AND RELAYS TO INITIATE AUTOMATIC-STARTING AND -STOPPING SIGNALS FOR ENGINE-GENERATOR SETS.

1.3 DEFINITIONS

A. OPERATIONAL BANDWIDTH: THE TOTAL VARIATION FROM THE LOWEST TO HIGHEST VALUE OF A PARAMETER OVER THE RANGE OF CONDITIONS INDICATED, EXPRESSED AS A PERCENTAGE OF THE NOMINAL VALUE OF THE PARAMETER.

B. STEADY-STATE VOLTAGE MODULATION: THE UNIFORM CYCLICAL VARIATION OF VOLTAGE WITHIN THE OPERATIONAL BANDWIDTH, EXPRESSED IN HERTZ OR CYCLES PER SECOND.

1.4 SUBMITTALS

A. PRODUCT DATA: INCLUDE THE FOLLOWING:

1. DATA ON FEATURES, COMPONENTS, ACCESSORIES RATINGS, AND PERFORMANCE.
2. THERMAL DAMAGE CURVE FOR GENERATOR.
3. TIME-CURRENT CHARACTERISTIC CURVES FOR GENERATOR PROTECTIVE DEVICE.
4. RECOMMENDED CIRCUIT BREAKER SETTING.
5. LOAD CALCULATIONS SHOWING MAXIMUM VOLTAGE DROP FOR EACH STEP.
6. EXHAUST SYSTEM INSULATION.
7. RAIN CAP.
8. EQUIPMENT ENCLOSURE WITH WIND RATING.
9. FUEL TANK WITH REQUIRED FUEL CONTAINMENT AND SAFEGUARDS.
10. PERMIT FOR FUEL STORAGE TANK AS REQUIRED BY THE MOBILE FIRE AND RESCUE DEPARTMENT.
11. EMERGENCY STOP SWITCH AND WIRING REQUIREMENTS.

B. SHOP DRAWINGS: DETAIL EQUIPMENT ASSEMBLIES AND INDICATE DIMENSIONS, WEIGHTS, LOADS, REQUIRED CLEARANCES, METHOD OF FIELD ASSEMBLY, COMPONENTS, AND LOCATION AND SIZE OF EACH FIELD CONNECTION.

1. DIMENSIONED OUTLINE PLAN AND ELEVATION DRAWINGS OF ENGINE-GENERATOR SET AND OTHER COMPONENTS SPECIFIED.
2. DESIGN CALCULATIONS: SIGNED AND SEALED BY A QUALIFIED PROFESSIONAL ENGINEER. CALCULATE REQUIREMENTS FOR SELECTING VIBRATION ISOLATORS AND SEISMIC RESTRAINTS AND FOR DESIGNING VIBRATION ISOLATION BASES.
3. VIBRATION ISOLATION BASE DETAILS: SIGNED AND SEALED BY A QUALIFIED PROFESSIONAL ENGINEER. DETAIL FABRICATION, INCLUDING ANCHORAGES AND ATTACHMENTS TO STRUCTURE AND TO SUPPORTED EQUIPMENT. INCLUDE BASE WEIGHTS.
4. WIRING DIAGRAMS: POWER, SIGNAL, AND CONTROL WIRING.

C. QUALIFICATION DATA: FOR MANUFACTURER.

D. CERTIFIED SUMMARY OF PROTOTYPE-UNIT TEST REPORT.

E. CERTIFIED TEST REPORTS: FOR COMPONENTS AND ACCESSORIES THAT ARE EQUIVALENT, BUT NOT IDENTICAL, TO THOSE TESTED ON PROTOTYPE UNIT.

F. CERTIFIED SUMMARY OF PERFORMANCE TESTS: DEMONSTRATE COMPLIANCE WITH SPECIFIED REQUIREMENT TO MEET PERFORMANCE CRITERIA FOR SENSITIVE LOADS.

G. TEST REPORTS:

1. REPORT OF FACTORY TEST ON UNITS TO BE SHIPPED FOR THIS PROJECT, SHOWING EVIDENCE OF COMPLIANCE WITH SPECIFIED REQUIREMENTS.
2. REPORT OF SOUND GENERATION.
3. FIELD QUALITY-CONTROL TEST REPORTS.

H. CERTIFICATION OF TORSIONAL VIBRATION COMPATIBILITY: COMPLY WITH NFPA 110.

I. OPERATION AND MAINTENANCE DATA: FOR PACKAGED ENGINE GENERATORS TO INCLUDE IN EMERGENCY, OPERATION, AND MAINTENANCE MANUALS. IN ADDITION, INCLUDE THE FOLLOWING:

1. LIST OF TOOLS AND REPLACEMENT ITEMS RECOMMENDED TO BE STORED AT THE PROJECT FOR READY ACCESS. INCLUDE PART AND DRAWING NUMBERS, CURRENT UNIT PRICES, AND SOURCE OF SUPPLY.

J. WARRANTY: SPECIAL WARRANTY SPECIFIED IN THIS SECTION.

1.5 QUALITY ASSURANCE

A. INSTALLER QUALIFICATIONS: MANUFACTURER'S AUTHORIZED REPRESENTATIVE WHO IS TRAINED AND APPROVED FOR INSTALLATION OF UNITS REQUIRED FOR THIS PROJECT.

1. MAINTENANCE PROXIMITY: NOT MORE THAN 4 HOURS' NORMAL TRAVEL TIME FROM INSTALLER'S PLACE OF BUSINESS TO PROJECT SITE.
2. ENGINEERING RESPONSIBILITY: PREPARATION OF DATA FOR VIBRATION ISOLATORS AND SEISMIC RESTRAINTS OF ENGINE SKID MOUNTS, INCLUDING SHOP DRAWINGS, BASED ON TESTING AND ENGINEERING ANALYSIS OF MANUFACTURER'S STANDARD UNITS IN ASSEMBLIES SIMILAR TO THOSE INDICATED FOR THIS PROJECT.

B. MANUFACTURER'S DISTRIBUTOR QUALIFICATIONS: A QUALIFIED SUPPLIER. MAINTAIN, WITHIN 100 MILES OF PROJECT SITE, A SERVICE CENTER CAPABLE OF PROVIDING TRAINING, PARTS, AND EMERGENCY MAINTENANCE REPAIRS. SERVICE CANNOT BE SUBLET TO ANOTHER SERVICE ORGANIZATION.

C. SOURCE LIMITATIONS: OBTAIN PACKAGED GENERATOR SETS AND AUXILIARY COMPONENTS THROUGH ONE SOURCE FROM A SINGLE MANUFACTURER.

D. COMPLY WITH NFPA 30 37A.

E. COMPLY WITH NFPA 70.

F. COMPLY WITH NFPA 99.

G. COMPLY WITH NFPA 110 REQUIREMENTS FOR EMERGENCY POWER SUPPLY SYSTEM.

H. ENGINE EXHAUST EMISSIONS: COMPLY WITH APPLICABLE STATE AND LOCAL GOVERNMENT REQUIREMENTS.

I. NOISE EMISSION: COMPLY WITH APPLICABLE STATE AND LOCAL GOVERNMENT REQUIREMENTS FOR MAXIMUM NOISE LEVEL AT ADJACENT PROPERTY BOUNDARIES DUE TO SOUND EMITTED BY GENERATOR SET INCLUDING ENGINE, ENGINE EXHAUST, ENGINE COOLING-AIR INTAKE AND DISCHARGE, AND OTHER COMPONENTS OF INSTALLATION.

J. FUEL CONTAINMENT. COMPLY WITH APPLICABLE STATE AND LOCAL REQUIREMENTS.

1.6 COORDINATION

A. COORDINATE SIZE AND LOCATION OF CONCRETE BASES. CAST ANCHOR-BOLT INSERTS INTO BASES. CONCRETE, REINFORCEMENT, AND FORMWORK REQUIREMENTS ARE SPECIFIED IN DIVISION 3.

1.7 WARRANTY

A. SPECIAL WARRANTY: MANUFACTURER'S STANDARD FORM IN WHICH MANUFACTURER AGREES TO REPAIR OR REPLACE COMPONENTS OF PACKAGED ENGINE GENERATORS AND ASSOCIATED AUXILIARY COMPONENTS THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN SPECIFIED WARRANTY PERIOD.

1. WARRANTY PERIOD: FIVE YEARS FROM DATE OF SUBSTANTIAL COMPLETION.

1.8 MAINTENANCE SERVICE

A. INITIAL MAINTENANCE SERVICE: BEGINNING AT SUBSTANTIAL COMPLETION, PROVIDE 24 MONTHS' FULL MAINTENANCE BY SKILLED EMPLOYEES OF MANUFACTURER'S DESIGNATED SERVICE ORGANIZATION. INCLUDE QUARTERLY EXERCISING TO CHECK FOR PROPER STARTING, LOAD TRANSFER, AND RUNNING UNDER LOAD. INCLUDE ROUTINE PREVENTIVE MAINTENANCE AS RECOMMENDED BY MANUFACTURER AND ADJUSTING AS REQUIRED FOR PROPER OPERATION. MAINTENANCE AGREEMENTS SHALL INCLUDE PARTS AND SUPPLIES AS USED IN MANUFACTURE AND INSTALLATION OF ORIGINAL EQUIPMENT.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:

1. CATERPILLAR; ENGINE DIV.
2. KOHLER CO; GENERATOR DIVISION.
3. ONAN CORP./CUMMINS POWER GENERATION; INDUSTRIAL BUSINESS GROUP.
4. GENERAC GENERATORS
5. TAYLOR POWER SYSTEMS

2.2 ENGINE-GENERATOR SET

A. PACKAGED ENGINE-GENERATOR SET SHALL BE A COORDINATED ASSEMBLY OF COMPATIBLE COMPONENTS.

B. POWER OUTPUT RATINGS: NOMINAL RATINGS AS INDICATED, WITH CAPACITY AS REQUIRED TO OPERATE AS A UNIT AS EVIDENCED BY RECORDS OF PROTOTYPE TESTING.

C. OUTPUT CONNECTIONS: THREE PHASE, FOUR WIRE.

D. SAFETY STANDARD: COMPLY WITH ASME B15.1.

E. NAMEPLATES: EACH MAJOR SYSTEM COMPONENT SHALL BE EQUIPPED WITH A NAMEPLATE TO IDENTIFY MANUFACTURER'S NAME AND ADDRESS, AND MODEL AND SERIAL NUMBER OF COMPONENTS.

F. MOUNTING FRAME: ADEQUATE STRENGTH AND RIGIDITY TO MAINTAIN ALIGNMENT OF MOUNTED COMPONENTS WITHOUT DEPENDING ON CONCRETE FOUNDATION. MOUNTING FRAME SHALL BE FREE FROM SHARP EDGES AND CORNERS AND SHALL HAVE LIFTING ATTACHMENTS ARRANGED FOR LIFTING WITH SLINGS WITHOUT DAMAGING COMPONENTS.

1. RIGGING DIAGRAM: INSCRIBED ON METAL PLATE PERMANENTLY ATTACHED TO MOUNTING FRAME TO INDICATE LOCATION AND LIFTING CAPACITY OF EACH LIFTING ATTACHMENT AND GENERATOR-SET CENTER OF GRAVITY.

2.3 GENERATOR-SET PERFORMANCE

A. OVER SIZING GENERATOR COMPARED WITH THE RATED POWER OUTPUT OF THE ENGINE IS PERMISSIBLE TO MEET SPECIFIED PERFORMANCE.

1. NAMEPLATE DATA FOR OVERSIZED GENERATOR: SHOW RATINGS REQUIRED BY THE CONTRACT DOCUMENTS RATHER THAN RATINGS THAT WOULD NORMALLY BE APPLIED TO GENERATOR SIZE INSTALLED.
2. GENERATOR TEMPERATURE SHALL BE CLASS F OR CLASS B. MINIMUM RATINGS SHALL BE 90 DEGREE C LLOYDS, 95 DEGREE C ABS, 105 DEGREE C CONTINUOUS, 130 DEGREE C STANDBY (RISE BY RESISTANCE METHOD, MIL-STD-705, METHOD 680.1B).

B. STEADY-STATE VOLTAGE OPERATIONAL BANDWIDTH: 1 PERCENT OF RATED OUTPUT VOLTAGE FROM NO LOAD TO FULL LOAD.

C. STEADY-STATE VOLTAGE MODULATION FREQUENCY: LESS THAN 1 HZ.

D. TRANSIENT VOLTAGE PERFORMANCE: NOT MORE THAN 10 PERCENT VARIATION FOR 50 PERCENT STEP-LOAD INCREASE OR DECREASE. VOLTAGE SHALL RECOVER AND REMAIN WITHIN THE STEADY-STATE OPERATING BAND WITHIN 3 SECONDS.

E. STEADY-STATE FREQUENCY OPERATIONAL BANDWIDTH: PLUS OR MINUS 0.25 PERCENT OF RATED FREQUENCY FROM NO LOAD TO FULL LOAD.

F. STEADY-STATE FREQUENCY STABILITY: WHEN SYSTEM IS OPERATING AT ANY CONSTANT LOAD WITHIN THE RATED LOAD, THERE SHALL BE NO RANDOM SPEED VARIATIONS OUTSIDE THE STEADY-STATE OPERATIONAL BAND AND NO HUNTING OR SURGING OF SPEED.

G. TRANSIENT FREQUENCY PERFORMANCE: LESS THAN 2-HZ VARIATION FOR A 50 PERCENT STEP-LOAD INCREASE OR DECREASE. FREQUENCY SHALL RECOVER AND REMAIN WITHIN THE STEADY-STATE OPERATING BAND WITHIN THREE SECONDS.

H. OUTPUT WAVEFORM: AT NO LOAD, HARMONIC CONTENT MEASURED LINE TO NEUTRAL SHALL NOT EXCEED 2 PERCENT TOTAL WITH NO SLOT RIPPLE. THE TELEPHONE INFLUENCE FACTOR, DETERMINED ACCORDING TO NEMA MG 1, SHALL NOT EXCEED 50 PERCENT.

I. SUSTAINED SHORT-CIRCUIT CURRENT: FOR A 3-PHASE, BOLTED SHORT CIRCUIT AT SYSTEM OUTPUT TERMINALS, THE SYSTEM SHALL SUPPLY A MINIMUM OF 300 PERCENT OF RATED FULL-LOAD CURRENT FOR NOT LESS THAN 10 SECONDS AND THEN CLEAR THE FAULT AUTOMATICALLY, WITHOUT DAMAGE TO WINDING INSULATION OR OTHER GENERATOR SYSTEM COMPONENTS AND WITHOUT A CURRENT BOOST SYSTEM.

J. EXCITATION SYSTEM: PERFORMANCE SHALL BE UNAFFECTED BY VOLTAGE DISTORTION CAUSED BY NONLINEAR LOAD.

K. START TIME: COMPLY WITH NFPA 110, TYPE 10, SYSTEM REQUIREMENTS.

2.4 SERVICE CONDITIONS

A. ENVIRONMENTAL CONDITIONS: ENGINE-GENERATOR SYSTEM SHALL WITHSTAND THE FOLLOWING ENVIRONMENTAL CONDITIONS WITHOUT MECHANICAL OR ELECTRICAL DAMAGE OR DEGRADATION OF PERFORMANCE CAPABILITY:

1. AMBIENT TEMPERATURE: MINUS 15 TO PLUS 40 DEG C.
2. ALTITUDE: SEA LEVEL TO 500 FEET.

2.5 ENGINE

A. FUEL: FUEL OIL, GRADE DF-2.

B. RATED ENGINE SPEED: 1800 RPM.

C. MAXIMUM PISTON SPEED FOR FOUR-CYCLE ENGINES: 2250 FPM (11.4 M/S).

D. LUBRICATION SYSTEM: THE FOLLOWING ITEMS ARE MOUNTED ON ENGINE OR SKID:

1. FILTER AND STRAINER: RATED TO REMOVE 90 PERCENT OF PARTICLES 5 MICROMETERS AND SMALLER WHILE PASSING FULL FLOW.
2. THERMOSTATIC CONTROL VALVE: CONTROL FLOW IN SYSTEM TO MAINTAIN OPTIMUM OIL TEMPERATURE. UNIT SHALL BE CAPABLE OF FULL FLOW AND IS DESIGNED TO BE FAIL-SAFE.
3. CRANKCASE DRAIN: ARRANGED FOR COMPLETE GRAVITY DRAINAGE TO AN EASILY REMOVABLE CONTAINER WITH NO DISASSEMBLY AND WITHOUT USE OF PUMPS, SIPHONS, SPECIAL TOOLS, OR APPLIANCES.

E. ENGINE FUEL SYSTEM:

1. MAIN FUEL PUMP: MOUNTED ON ENGINE. PUMP ENSURES ADEQUATE PRIMARY FUEL FLOW UNDER STARTING AND LOAD CONDITIONS.
2. RELIEF-BYPASS VALVE: AUTOMATICALLY REGULATES PRESSURE IN FUEL LINE AND RETURNS EXCESS FUEL TO SOURCE.

F. COOLANT JACKET HEATER: ELECTRIC-IMMERSION TYPE, FACTORY INSTALLED IN COOLANT JACKET SYSTEM. COMPLY WITH NFPA 110 REQUIREMENTS FOR LEVEL 1 EQUIPMENT FOR HEATER CAPACITY.

G. GOVERNOR: ADJUSTABLE ISOCHRONOUS, WITH SPEED SENSING.

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5-11-2021

NUMBER	REVISION DESCRIPTION

FIRE STATION #16 - EMERGENCY GENERATOR & SERVICE MODIFICATIONS
MOBILE, ALABAMA

DESIGNED BY: TMM
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SECTION 16201 - DIESEL GENERATOR SPECIFICATIONS

2.6 ENGINE COOLING SYSTEM

A. DESCRIPTION: CLOSED LOOP, LIQUID COOLED, WITH RADIATOR FACTORY MOUNTED ON ENGINE-GENERATOR-SET MOUNTING FRAME AND INTEGRAL ENGINE-DRIVEN COOLANT PUMP.

B. RADIATOR: RATED FOR SPECIFIED COOLANT.

C. COOLANT: SOLUTION OF 50 PERCENT ETHYLENE-GLYCOL-BASED ANTIFREEZE AND 50 PERCENT WATER, WITH ANTICORROSION ADDITIVES AS RECOMMENDED BY ENGINE MANUFACTURER.

D. TEMPERATURE CONTROL: SELF-CONTAINED, THERMOSTATIC-CONTROL VALVE MODULATES COOLANT FLOW AUTOMATICALLY TO MAINTAIN OPTIMUM CONSTANT COOLANT TEMPERATURE AS RECOMMENDED BY ENGINE MANUFACTURER.

E. COOLANT HOSE: FLEXIBLE ASSEMBLY WITH INSIDE SURFACE OF NONPOROUS RUBBER AND OUTER COVERING OF AGING-, ULTRAVIOLET-, AND ABRASION-RESISTANT FABRIC.

1. RATING: 50-PSIG (345-KPA) MAXIMUM WORKING PRESSURE WITH COOLANT AT 180 DEG F (82 DEG C), AND NOT COLLAPSIBLE UNDER VACUUM.

2. END FITTINGS: FLANGES OR STEEL PIPE NIPPLES WITH CLAMPS TO SUIT PIPING AND EQUIPMENT CONNECTIONS.

2.7 FUEL SUPPLY SYSTEM

A. COMPLY WITH NFPA 30.

B. BASE-MOUNTED FUEL OIL TANK: FACTORY INSTALLED AND PIPED, COMPLYING WITH ALL LOCAL, STATE AND FEDERAL GUIDELINES AND WITH UL 142 FUEL OIL TANK. FEATURES INCLUDE THE FOLLOWING:

1. TANK LEVEL INDICATOR.

2. DUAL WALL CONSTRUCTION WITH LEAK DETECTION.

3. CAPACITY: FUEL FOR 48 HOURS CONTINUOUS OPERATION AT 100 PERCENT RATED POWER OUTPUT.

4. VANDAL-RESISTANT FILL CAP WITH SPILL CONTAINMENT IN ACCORDANCE WITH ALL APPLICABLE CODES AND ORDINANCES.

5. CONTAINMENT PROVISIONS: COMPLY WITH REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.

2.8 ENGINE EXHAUST SYSTEM

A. MUFFLER: CRITICAL TYPE, SIZED AS RECOMMENDED BY ENGINE MANUFACTURER; SOUND LEVEL MEASURED AT A DISTANCE OF 10 FEET (3 M) FROM EXHAUST DISCHARGE SHALL BE 85 DBA OR LESS. MUFFLER SHALL BE MOUNTED INSIDE GENERATOR WEATHERPROOF HOUSING. SHALL BE MOUNTED SUCH THAT GENERATOR HOUSING CAN BE FULLY OPENED FOR MAINTENANCE.

B. CONDENSATE DRAIN FOR MUFFLER: SCHEDULE 40, BLACK STEEL PIPE CONNECTED TO MUFFLER DRAIN OUTLET THROUGH A PETCOCK.

C. CONNECTION FROM ENGINE TO EXHAUST SYSTEM: FLEXIBLE SECTION OF CORRUGATED STAINLESS-STEEL PIPE.

D. CONNECTION FROM EXHAUST PIPE TO MUFFLER: STAINLESS-STEEL EXPANSION JOINT WITH LINER.

E. EXHAUST PIPING EXTERNAL TO ENGINE: ASTM A 53/A 53M, SCHEDULE 40, WELDED, BLACK STEEL, WITH WELDED JOINTS AND FITTINGS AND EXTERIOR INSULATION.

F. RAIN CAP: RAIN CAP SHALL BE ALUMINUM OR STAINLESS STEEL AND SHALL PENETRATE THE TOP OF THE HOUSING AND CONTAIN NO ELBOWS OUTSIDE HOUSING.

G. INSULATION: FOR ALL INSTALLATIONS, THE EXHAUST SYSTEM SHALL BE FULLY INSULATED AS RECOMMENDED BY THE GENERATOR MANUFACTURER.

2.9 COMBUSTION-AIR INTAKE

A. DESCRIPTION: HEAVY-DUTY, ENGINE-MOUNTED AIR CLEANER WITH REPLACEABLE DRY-FILTER ELEMENT AND "BLOCKED FILTER" INDICATOR.

2.10 STARTING SYSTEM

A. DESCRIPTION: 12-V ELECTRIC, WITH NEGATIVE GROUND AND INCLUDING THE FOLLOWING ITEMS:

1. COMPONENTS: SIZED SO THEY WILL NOT BE DAMAGED DURING A FULL ENGINE-CRANKING CYCLE WITH AMBIENT TEMPERATURE AT MAXIMUM SPECIFIED IN "ENVIRONMENTAL CONDITIONS" PARAGRAPH IN "SERVICE CONDITIONS" ARTICLE.

2. CRANKING MOTOR: HEAVY-DUTY UNIT THAT AUTOMATICALLY ENGAGES AND RELEASES FROM ENGINE FLYWHEEL WITHOUT BINDING.

3. CRANKING CYCLE: AS REQUIRED BY NFPA 110 FOR SYSTEM LEVEL SPECIFIED.

4. BATTERY: ADEQUATE CAPACITY WITHIN AMBIENT TEMPERATURE RANGE SPECIFIED IN "ENVIRONMENTAL CONDITIONS" PARAGRAPH IN "SERVICE CONDITIONS" ARTICLE TO PROVIDE SPECIFIED CRANKING CYCLE AT LEAST TWICE WITHOUT RECHARGING.

5. BATTERY CABLE: SIZE AS RECOMMENDED BY ENGINE MANUFACTURER FOR CABLE LENGTH INDICATED. INCLUDE REQUIRED INTERCONNECTING CONDUCTORS AND CONNECTION ACCESSORIES.

6. BATTERY COMPARTMENT: FACTORY FABRICATED OF METAL WITH ACID-RESISTANT FINISH AND THERMAL INSULATION. INCLUDE ACCESSORIES REQUIRED TO SUPPORT AND FASTEN BATTERIES IN PLACE.

7. BATTERY-CHARGING ALTERNATOR: FACTORY MOUNTED ON ENGINE WITH SOLID-STATE VOLTAGE REGULATION AND 35-A MINIMUM CONTINUOUS RATING.

8. BATTERY CHARGER: CURRENT-LIMITING, AUTOMATIC-EQUALIZING AND FLOAT-CHARGING TYPE. UNIT SHALL COMPLY WITH UL 1236 AND INCLUDE THE FOLLOWING FEATURES:

a. OPERATION: EQUALIZING-CHARGING RATE OF 10 A SHALL BE INITIATED AUTOMATICALLY AFTER BATTERY HAS LOST CHARGE UNTIL AN ADJUSTABLE EQUALIZING VOLTAGE IS ACHIEVED AT BATTERY TERMINALS. UNIT SHALL THEN BE AUTOMATICALLY SWITCHED TO A LOWER FLOAT-CHARGING MODE AND SHALL CONTINUE TO OPERATE IN THAT MODE UNTIL BATTERY IS DISCHARGED AGAIN.

b. AUTOMATIC TEMPERATURE COMPENSATION: ADJUST FLOAT AND EQUALIZE VOLTAGES FOR VARIATIONS IN AMBIENT TEMPERATURE FROM MINUS 40 DEG C TO PLUS 60 DEG C TO PREVENT OVERCHARGING AT HIGH TEMPERATURES AND UNDERCHARGING AT LOW TEMPERATURES.

c. AUTOMATIC VOLTAGE REGULATION: MAINTAIN CONSTANT OUTPUT VOLTAGE REGARDLESS OF INPUT VOLTAGE VARIATIONS UP TO PLUS OR MINUS 10 PERCENT.

d. AMMETER AND VOLTMETER: FLUSH MOUNTED IN DOOR. METERS SHALL INDICATE CHARGING RATES.

e. SAFETY FUNCTIONS: SENSE ABNORMALLY LOW BATTERY VOLTAGE AND CLOSE CONTACTS PROVIDING LOW BATTERY VOLTAGE INDICATION ON CONTROL AND MONITORING PANEL. SENSE HIGH BATTERY VOLTAGE AND LOSS OF AC INPUT OR DC OUTPUT OF BATTERY CHARGER. EITHER CONDITION SHALL CLOSE CONTACTS THAT PROVIDE A BATTERY-CHARGER MALFUNCTION INDICATION AT SYSTEM CONTROL AND MONITORING PANEL.

f. ENCLOSURE AND MOUNTING: NEMA 250, TYPE 1, WALL-MOUNTED CABINET.

2.11 CONTROL AND MONITORING

A. FUNCTIONAL DESCRIPTION: WHEN MODE-SELECTOR SWITCH ON THE CONTROL AND MONITORING PANEL IS IN THE AUTOMATIC POSITION, REMOTE-CONTROL CONTACTS IN ONE OR MORE SEPARATE AUTOMATIC TRANSFER SWITCHES INITIATE STARTING AND STOPPING OF THE GENERATOR SET. WHEN MODE-SELECTOR SWITCH IS SWITCHED TO THE ON POSITION, THE GENERATOR SET STARTS. THE OFF POSITION OF THE SAME SWITCH INITIATES GENERATOR-SET SHUTDOWN. WHEN GENERATOR SET IS RUNNING, SPECIFIED SYSTEM OR EQUIPMENT FAILURES OR DERANGEMENTS AUTOMATICALLY SHUT DOWN THE GENERATOR SET AND INITIATE ALARMS. OPERATION OF A REMOTE EMERGENCY-STOP SWITCH ALSO SHUTS DOWN THE GENERATOR SET. CONTROL SYSTEM SHALL BE MICROPROCESSOR BASED.

B. CONFIGURATION: OPERATING AND SAFETY INDICATIONS, PROTECTIVE DEVICES, BASIC SYSTEM CONTROLS, AND ENGINE GAGES SHALL BE GROUPED IN A COMMON CONTROL AND MONITORING PANEL MOUNTED ON THE GENERATOR SET. MOUNTING METHOD SHALL ISOLATE THE CONTROL PANEL FROM GENERATOR-SET VIBRATION.

C. INDICATING AND PROTECTIVE DEVICES AND CONTROLS SHALL INCLUDE THOSE REQUIRED BY NFPA 110, AND THE FOLLOWING:

D: INDICATING AND PROTECTIVE DEVICES AND CONTROLS:

1. AC VOLTMETER.

2. AC AMMETER.

3. AC FREQUENCY METER.

4. DC VOLTMETER (ALTERNATOR BATTERY CHARGING).

5. ENGINE-COOLANT TEMPERATURE GAGE.

6. ENGINE LUBRICATING-OIL PRESSURE GAGE.

7. RUNNING-TIME METER.

8. AMMETER-VOLTMETER, PHASE-SELECTOR SWITCH(ES).

9. GENERATOR-VOLTAGE ADJUSTING RHEOSTAT.

10. START-STOP SWITCH.

11. OVERSPEED SHUTDOWN DEVICE.

12. COOLANT HIGH-TEMPERATURE SHUTDOWN DEVICE.

13. COOLANT LOW-LEVEL SHUTDOWN DEVICE.

14. OIL LOW-PRESSURE SHUTDOWN DEVICE.

15. FUEL TANK DERANGEMENT ALARM.

16. FUEL TANK HIGH-LEVEL SHUTDOWN OF FUEL SUPPLY ALARM.

E. SUPPORTING ITEMS: INCLUDE SENSORS, TRANSDUCERS, TERMINALS, RELAYS, AND OTHER DEVICES AND INCLUDE WIRING REQUIRED TO SUPPORT SPECIFIED ITEMS. LOCATE SENSORS AND OTHER SUPPORTING ITEMS ON ENGINE OR GENERATOR, UNLESS OTHERWISE INDICATED.

F. CONNECTION TO DATA LINK: A SEPARATE TERMINAL BLOCK, FACTORY WIRED TO FORM C DRY CONTACTS, FOR EACH ALARM AND STATUS INDICATION IS RESERVED FOR CONNECTIONS FOR DATA-LINK TRANSMISSION OF INDICATIONS TO REMOTE DATA TERMINALS. DATA SYSTEM CONNECTIONS TO TERMINALS ARE COVERED IN DIVISION 16 SECTION "ELECTRICAL POWER MONITORING AND CONTROL."

G. COMMON REMOTE AUDIBLE ALARM: SIGNAL THE OCCURRENCE OF ANY EVENTS LISTED BELOW WITHOUT DIFFERENTIATING BETWEEN EVENT TYPES. CONNECT SO THAT AFTER AN ALARM IS SILENCED, CLEARING OF INITIATING CONDITION WILL REACTIVATE ALARM UNTIL SILENCING SWITCH IS RESET.

1. ENGINE HIGH-TEMPERATURE SHUTDOWN.

2. LUBE-OIL LOW-PRESSURE SHUTDOWN.

3. OVER SPEED SHUTDOWN.

4. REMOTE EMERGENCY-STOP SHUTDOWN.

5. ENGINE HIGH-TEMPERATURE PREALARM.

6. LUBE-OIL LOW-PRESSURE PREALARM.

7. FUEL TANK, LOW-FUEL LEVEL.

8. LOW COOLANT LEVEL.

9. OVER CRANK SHUTDOWN.

10. COOLANT LOW-TEMPERATURE ALARM.

11. CONTROL SWITCH NOT IN AUTO POSITION.

12. BATTERY-CHARGER MALFUNCTION ALARM.

13. BATTERY LOW-VOLTAGE ALARM.

H. REMOTE ALARM ANNUNCIATOR: COMPLY WITH NFPA 99. LABELED LED SHALL IDENTIFY EACH ALARM EVENT. COMMON AUDIBLE SIGNAL SHALL SOUND FOR ALARM CONDITIONS. SILENCING SWITCH IN FACE OF PANEL SHALL SILENCE SIGNAL WITHOUT ALTERING VISUAL INDICATION. CONNECT SO THAT AFTER AN ALARM IS SILENCED, CLEARING OF INITIATING CONDITION WILL REACTIVATE ALARM UNTIL SILENCING SWITCH IS RESET. CABINET AND FACEPLATE ARE SURFACE- OR FLUSH-MOUNTING TYPE TO SUIT MOUNTING CONDITIONS INDICATED.

I. REMOTE EMERGENCY-STOP SWITCH: FLUSH; WALL MOUNTED, UNLESS OTHERWISE INDICATED; AND LABELED. PUSH BUTTON SHALL BE PROTECTED FROM ACCIDENTAL OPERATION. INSTALL AS INDICATED ON THE DRAWINGS OR ENGINEER APPROVED LOCATION.

2.12 GENERATOR OVERCURRENT AND FAULT PROTECTION

A. GENERATOR CIRCUIT BREAKER: MOLDED-CASE, THERMAL-MAGNETIC TYPE; 100 PERCENT RATED; COMPLYING WITH NEMA AB 1 AND UL 489.

1. TRIPPING CHARACTERISTIC: DESIGNED SPECIFICALLY FOR GENERATOR PROTECTION. PROVIDE CIRCUIT BREAKER SETTINGS TO COORDINATE WITH GENERATOR DAMAGE CHARACTERISTICS.

2. TRIP RATING: MATCHED TO GENERATOR RATING.

3. SHUNT TRIP: CONNECTED TO TRIP BREAKER WHEN GENERATOR SET IS SHUT DOWN BY OTHER PROTECTIVE DEVICES.

4. MOUNTING: ADJACENT TO OR INTEGRATED WITH CONTROL AND MONITORING PANEL.

B. GROUND-FAULT INDICATION (WHERE INDICATED ON DRAWINGS): COMPLY WITH NFPA 70, ARTICLE 700-7(D). INTEGRATE GROUND-FAULT ALARM INDICATION WITH OTHER GENERATOR-SET ALARM INDICATIONS.

2.13 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

A. COMPLY WITH NEMA MG 1 AND SPECIFIED PERFORMANCE REQUIREMENTS.

B. DRIVE: GENERATOR SHAFT SHALL BE DIRECTLY CONNECTED TO ENGINE SHAFT. EXCITER SHALL BE ROTATED INTEGRALLY WITH GENERATOR ROTOR.

C. ELECTRICAL INSULATION: CLASS F.

D. STATOR-WINDING LEADS: BROUGHT OUT TO TERMINAL BOX TO PERMIT FUTURE RECONNECTION FOR OTHER VOLTAGES IF REQUIRED.

E. CONSTRUCTION SHALL PREVENT MECHANICAL, ELECTRICAL, AND THERMAL DAMAGE DUE TO VIBRATION, OVER SPEED UP TO 125 PERCENT OF RATING, AND HEAT DURING OPERATION AT 110 PERCENT OF RATED CAPACITY.

F. EXCITATION SHALL USE NO SLIP OR COLLECTOR RINGS, OR BRUSHES, AND SHALL BE ARRANGED TO SUSTAIN GENERATOR OUTPUT UNDER SHORT-CIRCUIT CONDITIONS AS SPECIFIED.

G. ENCLOSURE: DRIP PROOF.

H. INSTRUMENT TRANSFORMERS: MOUNTED WITHIN GENERATOR ENCLOSURE.

I. VOLTAGE REGULATOR: SOLID-STATE TYPE, SEPARATE FROM EXCITER, PROVIDING PERFORMANCE AS SPECIFIED.

1. ADJUSTING RHEOSTAT ON CONTROL AND MONITORING PANEL SHALL PROVIDE PLUS OR MINUS 5 PERCENT ADJUSTMENT OF OUTPUT-VOLTAGE OPERATING BAND. ISOLATED FROM LOAD TO PREVENT TRACKING.

J. STRIP HEATER: THERMOSTATICALLY CONTROLLED UNIT ARRANGED TO MAINTAIN STATOR WINDINGS ABOVE DEW POINT.

K. WINDINGS: TWO-THIRDS PITCH STATOR WINDING AND FULLY LINKED AMORTISSEUR WINDING. DIPPED AND BAKED, HARMONIC DISTORTION NOT TO EXCEED 5% TOTAL RMS LINE TO LINE.

L. SUBTRANSIENT REACTANCE: 12 PERCENT, MAXIMUM.

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ALABAMA LICENSED No. 25105 PROFESSIONAL ENGINEER ANDREW W. MAURIN
5-11-2021

NUMBER	REVISION DESCRIPTION

FIRE STATION #16 - EMERGENCY GENERATOR & SERVICE MODIFICATIONS
MOBILE, ALABAMA

DESIGNED BY: TMM
DRAWN BY: TMM
CHECKED BY: AWM
DATE: 05-11-2021

SHEET TITLE: ELECTRICAL SPECIFICATIONS & ABBREVIATIONS

SHEET: E-1.3

SECTION 16201 - DIESEL GENERATOR SPECIFICATIONS

2.14 OUTDOOR GENERATOR-SET ENCLOSURE

A. DESCRIPTION: VANDAL-RESISTANT, WEATHERPROOF PAINTED GALVANIZED STEEL HOUSING, WIND RESISTANT UP TO 150 MPH. MULTIPLE PANELS SHALL BE LOCKABLE AND PROVIDE ADEQUATE ACCESS TO COMPONENTS REQUIRING MAINTENANCE. PANELS SHALL BE REMOVABLE BY ONE PERSON WITHOUT TOOLS. INSTRUMENTS AND CONTROL SHALL BE MOUNTED WITHIN ENCLOSURE. ALL HARDWARE AND SCREWS SHALL BE STAINLESS STEEL.

B. ENGINE COOLING AIRFLOW THROUGH ENCLOSURE: MAINTAIN TEMPERATURE RISE OF SYSTEM COMPONENTS WITHIN REQUIRED LIMITS WHEN UNIT OPERATES AT 110 PERCENT OF RATED LOAD FOR 2 HOURS WITH AMBIENT TEMPERATURE AT TOP OF RANGE SPECIFIED IN SYSTEM SERVICE CONDITIONS.

1. LOUVERS: FIXED-ENGINE COOLING-AIR INLET AND DISCHARGE. STORM-PROOF AND DRAINABLE LOUVERS PREVENT ENTRY OF RAIN AND SNOW.

2.15 FINISHES

A. INDOOR AND OUTDOOR ENCLOSURES AND COMPONENTS: MANUFACTURER'S ELECTROSTATICALLY APPLIED POWDER COAT OVER CORROSION-RESISTANT PRETREATMENT AND COMPATIBLE STANDARD PRIMER.

2.16 SOURCE QUALITY CONTROL

A. PROTOTYPE TESTING: FACTORY TEST ENGINE-GENERATOR SET USING SAME ENGINE MODEL, CONSTRUCTED OF IDENTICAL OR EQUIVALENT COMPONENTS AND EQUIPPED WITH IDENTICAL OR EQUIVALENT ACCESSORIES.

1. TESTS: COMPLY WITH NFPA 110, LEVEL 1 ENERGY CONVERTERS IN PARAGRAPHS 3.2.1, 3.2.1.1, AND 3.2.1.2.

2. GENERATOR TESTS: COMPLY WITH IEEE 115.

3. COMPONENTS AND ACCESSORIES: ITEMS FURNISHED WITH INSTALLED UNIT THAT ARE NOT IDENTICAL TO THOSE ON TESTED PROTOTYPE SHALL HAVE BEEN FACTORY TESTED TO DEMONSTRATE COMPATIBILITY AND RELIABILITY.

B. PROJECT-SPECIFIC EQUIPMENT TESTS: BEFORE SHIPMENT, FACTORY TEST ENGINE-GENERATOR SET AND OTHER SYSTEM COMPONENTS AND ACCESSORIES MANUFACTURED SPECIFICALLY FOR THIS PROJECT. PERFORM TESTS AT RATED LOAD AND POWER FACTOR. INCLUDE THE FOLLOWING TESTS:

1. FULL LOAD RUN.

2. MAXIMUM POWER.

3. VOLTAGE REGULATION.

4. TRANSIENT AND STEADY-STATE GOVERNING.

5. SINGLE-STEP LOAD PICKUP.

6. SAFETY SHUTDOWN.

C. REPORT FACTORY TEST RESULTS WITHIN 10 DAYS OF COMPLETION OF TEST.

PART 3 - EXECUTION

3.1 EXAMINATION

A. EXAMINE AREAS, EQUIPMENT BASES, AND CONDITIONS, WITH INSTALLER PRESENT, FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION AND OTHER CONDITIONS AFFECTING PACKAGED ENGINE-GENERATOR PERFORMANCE.

B. EXAMINE ROUGHING-IN OF PIPING SYSTEMS AND ELECTRICAL CONNECTIONS. VERIFY ACTUAL LOCATIONS OF CONNECTIONS BEFORE PACKAGED ENGINE-GENERATOR INSTALLATION.

C. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

3.2 CONCRETE BASES

A. COORDINATE SIZE AND LOCATION OF CONCRETE BASES. SHALL BE 12" THICK, EXCEEDING GENSET FOOTPRINT BY 12" ON ALL SIDES AND BE 8" HIGHER THAN GRADE LEVEL. PROVIDE REBAR REINFORCEMENT, #5 ON 12" CENTERS ON TOP AND BOTTOM. PROVIDE A GROUND STRAP FROM REBAR, #1/0 COPPER.

B. PROVIDE A COUNTERPOISE GROUND LOOP AROUND THE CONCRETE PAD. GROUND LOOP SHALL BE #1/0 COPPER, 12" BELOW GRADE. PROVIDE FOUR DRIVEN GROUND RODS ON THE CORNERS OF THE COUNTERPOISE LOOP. GROUND RODS SHALL BE COPPER CLAD ¾" X 20'. BOND PAD REBAR WITH COUNTERPOISE LOOP. PROVIDE A #1/0 COPPER LEAD TO THE GENERATOR GROUNDING PAD.

3.3 INSTALLATION

A. COMPLY WITH PACKAGED ENGINE-GENERATOR MANUFACTURERS' WRITTEN INSTALLATION AND ALIGNMENT INSTRUCTIONS AND WITH NFPA 110.

B. INSTALL PACKAGED ENGINE GENERATORS LEVEL ON CONCRETE BASE.

1. VIBRATION ISOLATION: MOUNT PACKAGED ENGINE GENERATORS ON RESTRAINED SPRING ISOLATORS OR INTERNAL VIBRATION ISOLATORS.

C. INSTALL PACKAGED ENGINE GENERATOR TO PROVIDE ACCESS, WITHOUT REMOVING CONNECTIONS OR ACCESSORIES, FOR PERIODIC MAINTENANCE.

D. INSTALL EXHAUST-SYSTEM PIPING. EXTEND TO POINT OF TERMINATION OUTSIDE STRUCTURE. SIZE PIPING ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.

1. INSTALL CONDENSATE DRAIN PIPING FOR ENGINE EXHAUST SYSTEM. EXTEND DRAIN PIPING FROM LOW POINTS OF EXHAUST SYSTEM AND FROM MUFFLER TO CONDENSATE TRAPS AND TO POINT OF DISPOSITION.

2. SUPPORT EXHAUST PIPING AND MUFFLER WITH PIPE HANGERS SPACED A MAXIMUM OF 20 FEET (6 M) HORIZONTALLY AND AT EACH FLOOR VERTICALLY. PIPE HANGERS ARE SPECIFIED IN DIVISION 15 SECTION "HANGERS AND SUPPORTS."

3. RESTRAIN EXHAUST PIPING AND MUFFLERS WITH CABLE-TYPE BRACING ASSEMBLIES. CABLE-TYPE BRACING ASSEMBLIES ARE SPECIFIED IN DIVISION 16 SECTION "SEISMIC CONTROLS FOR ELECTRICAL WORK."

4. ALL EXHAUST PIPING AND MUFFLER WITHIN THE BUILDING SHALL BE INSULATED BY MANUFACTURER APPROVED INSULATION SYSTEM.

5. PROVIDE A MANUFACTURER APPROVED RAIN CAP ON THE END OF THE EXHAUST PIPING.

6. PROVIDE APPROVED BUILDING SLEEVE WHERE EXHAUST EXITS THE BUILDING. SLEEVE SHALL BE WEATHERPROOF.

E. ELECTRICAL WIRING: INSTALL ELECTRICAL DEVICES FURNISHED BY EQUIPMENT MANUFACTURERS BUT NOT SPECIFIED TO BE FACTORY MOUNTED.

3.4 CONNECTIONS

A. DRAWINGS INDICATE GENERAL ARRANGEMENT OF PIPING AND SPECIALTIES. THE FOLLOWING ARE SPECIFIC CONNECTION REQUIREMENTS:

1. INSTALL FUEL, COOLING-SYSTEM, AND EXHAUST-SYSTEM PIPING ADJACENT TO PACKAGED ENGINE GENERATOR TO ALLOW SERVICE AND MAINTENANCE.

2. CONNECT COOLING-SYSTEM WATER SUPPLY AND DRAIN PIPING TO DIESEL-ENGINE HEAT EXCHANGERS. INSTALL FLEXIBLE CONNECTORS AT CONNECTIONS TO ENGINE GENERATOR AND REMOTE RADIATOR.

3. CONNECT FUEL PIPING TO ENGINES WITH A GATE VALVE AND UNION.

a. DIESEL STORAGE TANKS, TANK ACCESSORIES, PIPING, VALVES, AND SPECIALTIES FOR FUEL SYSTEMS OUTSIDE THE BUILDING ARE SPECIFIED IN DIVISION 2 SECTION "FUEL OIL DISTRIBUTION."

b. DIESEL FUEL PIPING, VALVES, AND SPECIALTIES INSIDE THE BUILDING ARE SPECIFIED IN DIVISION 15 SECTION "FUEL OIL PIPING."

c. NATURAL- AND LP-GAS PIPING, VALVES, AND SPECIALTIES FOR GAS DISTRIBUTION OUTSIDE THE BUILDING ARE SPECIFIED IN DIVISION 2 SECTION "NATURAL GAS DISTRIBUTION."

d. NATURAL- AND LP-GAS PIPING, VALVES, AND SPECIALTIES FOR GAS PIPING INSIDE THE BUILDING ARE SPECIFIED IN DIVISION 15 SECTION "FUEL GAS PIPING."

4. CONNECT EXHAUST-SYSTEM PIPING TO ENGINES.

B. GROUND EQUIPMENT ACCORDING TO DIVISION 16 SECTION "GROUNDING AND BONDING." GENERATOR SHALL BE CONFIGURED AS A "SEPARATELY DERIVED ELECTRICAL SYSTEM" BY BONDING THE NEUTRAL AND GROUND AT THE GENERATOR.

C. CONNECT WIRING ACCORDING TO DIVISION 16 SECTION "CONDUCTORS AND CABLES."

D. TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 486A.

3.5 IDENTIFICATION

A. IDENTIFY SYSTEM COMPONENTS ACCORDING TO DIVISION 16 SECTION "BASIC ELECTRICAL MATERIALS AND METHODS."

3.6 FIELD QUALITY CONTROL

A. MANUFACTURER'S FIELD SERVICE: ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO INSPECT, TEST, AND ADJUST FIELD-ASSEMBLED COMPONENTS AND EQUIPMENT INSTALLATION, INCLUDING CONNECTIONS, AND TO ASSIST IN FIELD TESTING. REPORT RESULTS IN WRITING.

B. PERFORM THE FOLLOWING FIELD TESTS AND INSPECTIONS AND PREPARE TEST REPORTS:

1. PERFORM EACH ELECTRICAL TEST AND VISUAL AND MECHANICAL INSPECTION STATED IN NETA ATS, SECTIONS 7.15.2.1 AND 7.22.1 (EXCEPT FOR VIBRATION BASELINE TEST). CERTIFY COMPLIANCE WITH TEST PARAMETERS.

2. PERFORM TESTS RECOMMENDED BY MANUFACTURER.

3. NFPA 110 ACCEPTANCE TESTS: PERFORM TESTS REQUIRED BY NFPA 110 THAT ARE ADDITIONAL TO THOSE SPECIFIED HERE INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

a. SINGLE-STEP FULL-LOAD PICKUP TEST.

4. BATTERY TESTS: EQUALIZE CHARGING OF BATTERY CELLS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. RECORD INDIVIDUAL CELL VOLTAGES.

a. MEASURE CHARGING VOLTAGE AND VOLTAGES BETWEEN AVAILABLE BATTERY TERMINALS FOR FULL-CHARGING AND FLOAT-CHARGING CONDITIONS. CHECK ELECTROLYTE LEVEL AND SPECIFIC GRAVITY UNDER BOTH CONDITIONS.

b. TEST FOR CONTACT INTEGRITY OF ALL CONNECTORS. PERFORM AN INTEGRITY LOAD TEST AND A CAPACITY LOAD TEST FOR THE BATTERY.

c. VERIFY ACCEPTANCE OF CHARGE FOR EACH ELEMENT OF THE BATTERY AFTER DISCHARGE.

d. VERIFY THAT MEASUREMENTS ARE WITHIN MANUFACTURER'S SPECIFICATIONS.

5. BATTERY-CHARGER TESTS: VERIFY SPECIFIED RATES OF CHARGE FOR BOTH EQUALIZING AND FLOAT-CHARGING CONDITIONS.

6. SYSTEM INTEGRITY TESTS: METHODICALLY VERIFY PROPER INSTALLATION, CONNECTION, AND INTEGRITY OF EACH ELEMENT OF ENGINE-GENERATOR SYSTEM BEFORE AND DURING SYSTEM OPERATION. CHECK FOR AIR, EXHAUST, AND FLUID LEAKS.

C. COORDINATE TESTS WITH TESTS FOR TRANSFER SWITCHES AND RUN THEM CONCURRENTLY.

D. TEST INSTRUMENTS SHALL HAVE BEEN CALIBRATED WITHIN THE LAST 12 MONTHS, TRACEABLE TO STANDARDS OF THE NATIONAL INSTITUTE FOR STANDARDS AND TECHNOLOGY, AND ADEQUATE FOR MAKING POSITIVE OBSERVATION OF TEST RESULTS. MAKE CALIBRATION RECORDS AVAILABLE FOR EXAMINATION ON REQUEST.

E. LEAK TEST: AFTER INSTALLATION, CHARGE SYSTEM AND TEST FOR LEAKS. REPAIR LEAKS AND RETEST UNTIL NO LEAKS EXIST.

F. OPERATIONAL TEST: AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO CONFIRM PROPER MOTOR ROTATION AND UNIT OPERATION.

G. TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND EQUIPMENT.

H. REMOVE AND REPLACE MALFUNCTIONING UNITS AND RETEST AS SPECIFIED ABOVE.

I. RETEST: CORRECT DEFICIENCIES IDENTIFIED BY TESTS AND OBSERVATIONS AND RETEST UNTIL SPECIFIED REQUIREMENTS ARE MET.

J. REPORT RESULTS OF TESTS AND INSPECTIONS IN WRITING. RECORD ADJUSTABLE RELAY SETTINGS AND MEASURED INSULATION RESISTANCES, TIME DELAYS, AND OTHER VALUES AND OBSERVATIONS. ATTACH A LABEL OR TAG TO EACH TESTED COMPONENT INDICATING SATISFACTORY COMPLETION OF TESTS.

3.7 STARTUP SERVICE

A. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO PERFORM STARTUP SERVICE.

B. INSPECT FIELD-ASSEMBLED COMPONENTS AND EQUIPMENT INSTALLATION, INCLUDING PIPING AND ELECTRICAL CONNECTIONS. REPORT RESULTS IN WRITING.

C. COMPLETE INSTALLATION AND STARTUP CHECKS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. PROVIDE TEST DOCUMENTATION TO ENGINEER.

D. PROVIDE A FULL FUEL TANK AT FINAL ACCEPTANCE. FUEL SHALL BE NEW AND RECEIPT SHALL BE PROVIDED IN CLOSE OUT DOCUMENTS. PROVIDE SUITABLE FUEL ADDITIVE, AS RECOMMENDED BY MANUFACTURER, TO PRESERVE FUEL. INCLUDE INFORMATION ON FUEL ADDITIVE IN CLOSE OUT DOCUMENTS.

3.8 DEMONSTRATION

A. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN PACKAGED ENGINE GENERATORS.

1. COORDINATE THIS TRAINING WITH THAT FOR TRANSFER SWITCHES.

B. FULLY DEMONSTRATE OPERATION, MAINTENANCE, AND EMERGENCY PROCEDURES WITH OWNER'S REPRESENTATIVE.

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NUMBER	REVISION DESCRIPTION

FIRE STATION #16 - EMERGENCY GENERATOR & SERVICE MODIFICATIONS
MOBILE, ALABAMA

DESIGNED BY: TMM
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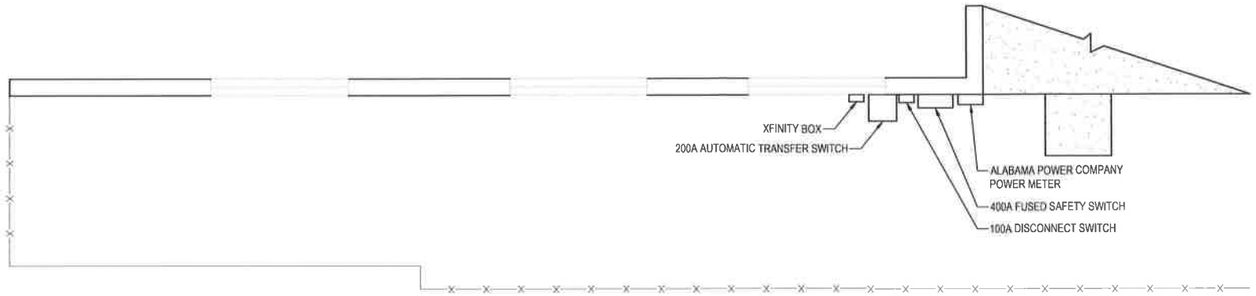
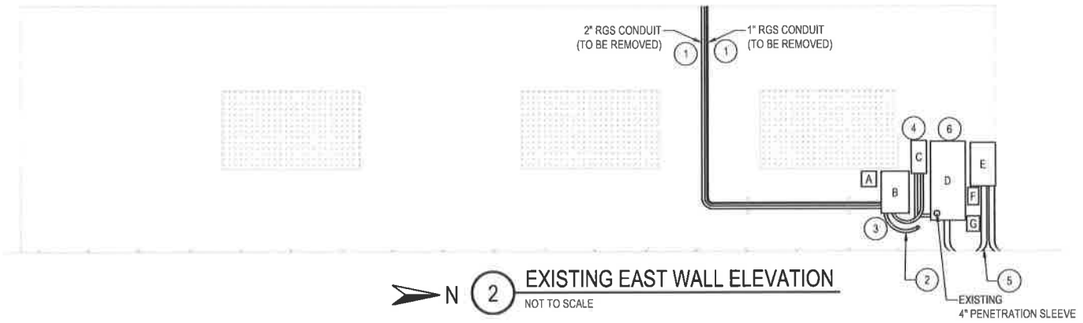
SHEET TITLE: ELECTRICAL SPECIFICATIONS & ABBREVIATIONS

SHEET: E-1.4



N (1) EXISTING EAST WALL PLAN VIEW
NOT TO SCALE



N (2) EXISTING EAST WALL ELEVATION
NOT TO SCALE

EXISTING/DEMOLITION ELEVATION LEGEND

A:	XFINITY BOX	(TO REMAIN)
B:	200A AUTOMATIC TRANSFER SWITCH	(TO BE REMOVED AND REPLACED NEW IN NEW WORK PHASE)
C:	100A 3-PH DISCONNECT SWITCH	(TO BE REMOVED)
D:	400A 208Y/120 VOLT SERVICE ENTRANCE RATED SWITCH	(TO BE REMOVED)
E:	ALABAMA POWER COMPANY POWER METER	(TO REMAIN)
F:	DISCONNECT SWITCH	(TO REMAIN)
G:	CONTACTOR	(TO REMAIN)

EXISTING/DEMOLITION GENERAL NOTES

1. THE ELECTRICAL CONTRACTOR IS TO ENSURE ALL NECESSARY ELECTRICAL EQUIPMENT, CIRCUITS, ETC. ARE DE-ENERGIZED PRIOR TO BEGINNING WORK.
2. THE EXISTING 30kW NATURAL GAS GENERATOR IS LOCATED NEAR THE SOUTHWEST CORNER OF THE FIRE STATION EXTERIOR. THE ELECTRICAL CONTRACTOR IS TO DISCONNECT AND REMOVE THIS GENERATOR. COORDINATE WITH A PLUMBING CONTRACTOR REGARDING THE REMOVAL OF THE NATURAL GAS PIPING TO THE EXISTING GENERATOR.

EXISTING/DEMOLITION SHEET NOTES

(1) THE ELECTRICAL CONTRACTOR IS TO DISCONNECT AND DEMOLISH CONDUIT AND WIRING FROM THE EXISTING 30kW NATURAL GAS GENERATOR TO THE EXISTING AUTOMATIC TRANSFER SWITCH. THE EXISTING GAS PIPING IS TO BE REMOVED FROM THE GENERATOR AND PROPERLY SEALED.

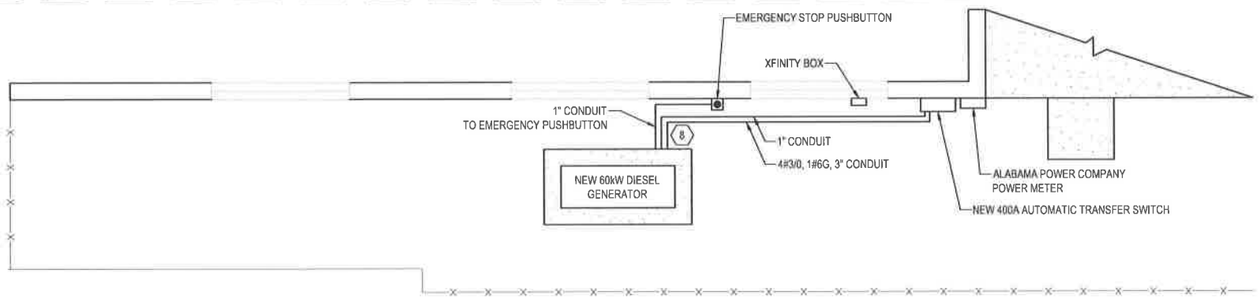
(2) THE ELECTRICAL CONTRACTOR IS TO DEMOLISH EXISTING WIRING (4#1/0, 1#8G) AND CONDUIT FROM THE EXISTING AUTOMATIC TRANSFER SWITCH TO PANEL A ON THE SOUTH WALL OF THE BUILDING INTERIOR.

(3) THE EXISTING 200A AUTOMATIC TRANSFER SWITCH IS TO BE DISCONNECTED, REMOVED, AND GIVEN TO THE CITY OF MOBILE. THE SWITCH IS TO BE REPLACED NEW DURING THE NEW WORK PHASE.

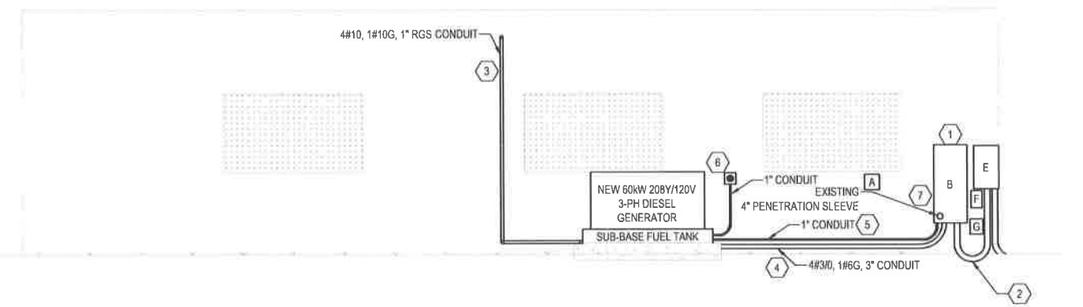
(4) THE EXISTING 100A DISCONNECT SWITCH IS TO BE DISCONNECTED, REMOVED, AND GIVEN TO THE CITY OF MOBILE.

(5) THE ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE THE CONDUIT AND WIRING FROM THE EXISTING POWER METER TO THE EXISTING 400A SERVICE ENTRANCE RATED SWITCH.

(6) THE EXISTING 400A SERVICE ENTRANCE RATED SWITCH IS TO BE DISCONNECTED, REMOVED, AND GIVEN TO THE CITY OF MOBILE.



N (3) NEW WORK EAST WALL PLAN VIEW
NOT TO SCALE



N (4) NEW WORK EAST WALL ELEVATION
NOT TO SCALE

NEW WORK ELEVATION LEGEND

A: EXISTING XFINITY BOX
B: NEW NEMA 3R 400A 208Y/120 VOLT AUTOMATIC TRANSFER SWITCH
E: EXISTING APCo METER
F: EXISTING DISCONNECT SWITCH
G: EXISTING CONTACTOR

NEW WORK GENERAL NOTES

1. THE ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL THE NEW 60kW DIESEL GENERATOR, A NEW GENERATOR PAD (AS SHOWN IN THE DETAILS), AND THE NEW GENERATOR GROUND GRID (AS SHOWN IN THE DETAILS).

NEW WORK SHEET NOTES

(1) THE ELECTRICAL CONTRACTOR IS TO PROVIDE AND INSTALL A NEW NEMA 3R 400A 3-POLE SERVICE ENTRANCE RATED AUTOMATIC TRANSFER SWITCH ON THE EAST EXTERIOR WALL OF THE FIRE STATION AS SHOWN.

(2) THE ELECTRICAL CONTRACTOR IS TO RE-USE, EXTEND, OR MODIFY THE EXISTING CONDUIT AND WIRING (4#500MCM, 4" CONDUIT) FROM APCo METER TO THE NEW 400A AUTOMATIC TRANSFER SWITCH LOCALE. PROVIDE NEW AS REQUIRED.

(3) THE ELECTRICAL CONTRACTOR IS TO FIELD ROUTE CONDUIT AND WIRING FROM THE NEW 60kW GENERATOR TO PANEL B ON THE SOUTH WALL OF THE BUILDING INTERIOR TO PROVIDE POWER FOR THE GENERATOR BLOCK HEATER AND BATTERY CHARGER. ALL BUILDING PENETRATIONS ARE TO BE PROPERLY SEALED.

(4) THE ELECTRICAL CONTRACTOR IS TO ROUTE AND SECURE CONDUIT AND WIRING TO THE BUILDING EXTERIOR FROM THE NEW 400A AUTOMATIC TRANSFER SWITCH TO THE NEW GENERATOR AS SHOWN.

(5) THE ELECTRICAL CONTRACTOR IS TO ROUTE 1" CONDUIT AND CONTROL WIRING AS SPECIFIED BY THE MANUFACTURER ALONG THE BUILDING EXTERIOR FROM THE NEW AUTOMATIC TRANSFER SWITCH TO THE NEW GENERATOR AS SHOWN.

(6) MAINTAINED OPERATOR PUSHBUTTON STATIONS. RED BUTTON IN STEEL NEMA 3R LOCKABLE BOX. LABEL WITH A RED MYCARTA PLACARD WITH 1" WHITE LETTERING,
"GENERATOR EMERGENCY STOP"
THE ELECTRICAL CONTRACTOR IS TO PROVIDE AND INSTALL 1" CONDUIT AND CONTROL WIRING ALONG THE BUILDING EXTERIOR AS SPECIFIED BY THE MANUFACTURER.

(7) THE ELECTRICAL CONTRACTOR IS TO RE-USE, EXTEND, MODIFY ROUTING, AND/OR PROVIDE THE FEEDER (4#500kcmil, 1#3G, 4" CONDUIT) FOR PANEL B TO THE APPROPRIATE LINE LUGS ON THE NEW 400A AUTOMATIC TRANSFER SWITCH AND TERMINATE.

(8) THE NEW CONDUIT AND WIRING FROM THE NEW GENERATOR TO THE NEW AUTOMATIC TRANSFER SWITCH IS TO BE SURFACE MOUNTED ON THE BUILDING EXTERIOR. SHOWN AS IS FOR CLARITY.

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ALABAMA LICENSED No. 25105 PROFESSIONAL ENGINEER ANDREW W. MAURIN
5-11-2021

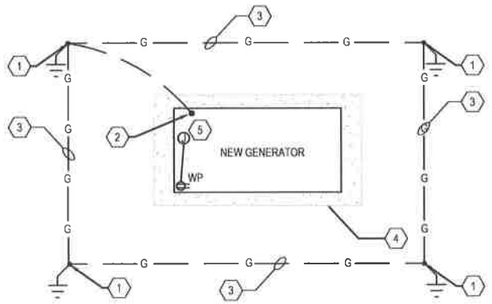
NUMBER	REVISION DESCRIPTION

FIRE STATION #16 - EMERGENCY GENERATOR & SERVICE MODIFICATIONS
MOBILE, ALABAMA

DESIGNED BY: TMM
DRAWN BY: TMM
CHECKED BY: AWM
DATE: 05-11-2021

SHEET TITLE: ELECTRICAL EXISTING & NEW WORK PLAN AND ELEVATION

SHEET: E-2.1

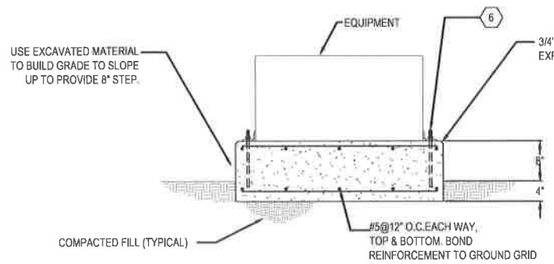


PLAN VIEW

EPOXY BOLT EMBEDMENT	
BOLT Ø	MINIMUM EMBEDMENT
1/2"	6"
5/8"	7 1/2"
3/4"	9"

1 GENERATOR GROUNDING/PAD DETAIL

NOT TO SCALE



2 GENERATOR PAD DETAIL

NOT TO SCALE

FOUNDATION NOTES:

1) THE COMPACT FILL SHALL MEET THE ASTM SPECIFICATIONS AS TO GRADATION AND METHOD OF COMPACTION. LIFTS SHALL NOT EXCEED 8" AFTER COMPACTION.

2) FILL MATERIAL, MUD, MUCK, PEAT, ORGANIC, SILT, LOOSE INORGANIC SILT AND SOFT CLAY SHALL BE CONSIDERED AS UNSATISFACTORY BEARING MATERIALS AND SHALL BE TREATED AS HAVING NO SOIL BEARING VALUE.

3) BACKFILL IN LAYERS NOT MORE THAN 8" LIFTS. COMPACT SOIL MATERIALS TO NOT LESS THAN 95% MODIFIED PROCTOR TEST.

EMERGENCY
STOP FOR
GENERATOR

ENGRAVED PLASTIC TAG WITH 1" HIGH WHITE LETTERS ON RED BACKGROUND. TAG SHALL HAVE ALL EDGES BEVELED AND SMOOTH. SECURE TAG WITH 2 CHROME (STAINLESS STEEL FOR WET OR DAMP LOCATIONS) SCREWS, ADHESIVE BACKING, TAPE, ETC IS NOT ALLOWED. TAG SHALL BE SIZED AS REQUIRED TO FIT APPROPRIATE TEXT.

3 GENERATOR E-STOP LABELING DETAIL

NOT TO SCALE

SHEET NOTES

1. PROVIDE 3/4" x 20' COPPER CLAD GROUND ROD.
2. THE ELECTRICAL CONTRACTOR IS TO CONNECT GROUNDING ROD ELECTRODE CONDUCTOR TO THE PAD REINFORCEMENT AND TO THE GENERATOR GROUND LUG. BOND NEUTRAL TO GROUND.
3. THE ELECTRICAL CONTRACTOR SHALL BOND NEW COPPER CLAD GROUND RODS WITH #1/0 TINNED STRANDED COPPER CONDUCTOR. THE ELECTRODE IS TO BE BONDED TO THE BUILDING STEEL.
4. THE GENERATOR PAD IS TO BE A MINIMUM OF 12" LARGER THAN THE GENERATOR IN EACH DIRECTION.
5. JUNCTION BOX INSTALLED TO PROVIDE BLOCK HEATER AND BATTERY CHARGER POWER.
6. STAINLESS STEEL ANCHOR BOLTS AS REQ'D BY EQUIPMENT MANUFACTURER, DRILL AND SET W/ HILTI HIT HY-150 EPOXY OR ENGINEER APPROVED EQUIVALENT, PROJECTION AS REQUIRED FOR EQUIPMENT, SEE TABLE FOR EMBEDMENT, PROVIDE MINIMUM SPACING AND EDGE DISTANCE AS RECOMMENDED BY HILTI. (TYPICAL)

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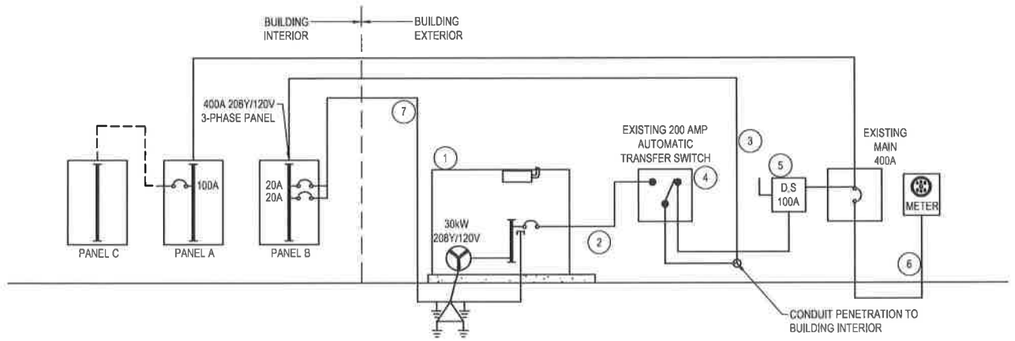
SHEET TITLE: ELECTRICAL DETAILS

SHEET: E-3.1

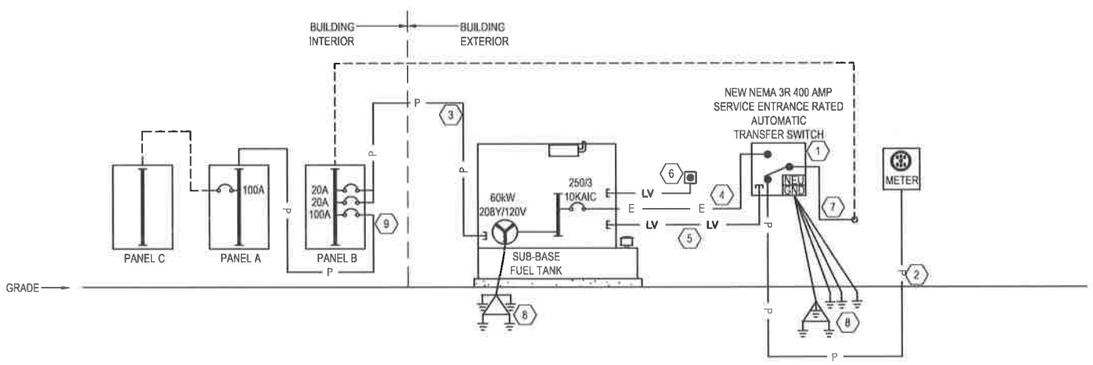


1 EXISTING SINGLE LINE RISER DIAGRAM

NOT TO SCALE

EXISTING/DEMOLITION SHEET NOTES

1. THE EXISTING 30kW NATURAL GAS GENERATOR IS LOCATED NEAR THE SOUTHWEST CORNER OF THE FIRE STATION EXTERIOR. THE ELECTRICAL CONTRACTOR IS TO DISCONNECT AND REMOVE THIS GENERATOR. COORDINATE WITH A PLUMBING CONTRACTOR REGARDING THE REMOVAL OF THE NATURAL GAS PIPING TO THE EXISTING GENERATOR.
2. THE ELECTRICAL CONTRACTOR IS TO DISCONNECT AND DEMOLISH CONDUIT AND WIRING FROM THE EXISTING 30kW NATURAL GAS GENERATOR TO THE EXISTING AUTOMATIC TRANSFER SWITCH.
3. THE ELECTRICAL CONTRACTOR IS TO SECURE EXISTING WIRING FROM THE EXISTING AUTOMATIC TRANSFER SWITCH TO PANEL B FOR CONNECTION TO THE NEW 400A AUTOMATIC TRANSFER SWITCH IN THE NEW WORK PHASE.
4. THE EXISTING 200A AUTOMATIC TRANSFER SWITCH IS TO BE DISCONNECTED, REMOVED, AND REPLACED NEW DURING THE NEW WORK PHASE.
5. THE EXISTING 100A DISCONNECT SWITCH AND ALL ASSOCIATED CONDUIT AND WIRING IS TO BE DISCONNECTED AND REMOVED.
6. THE ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE THE CONDUIT AND WIRING FROM THE EXISTING POWER METER TO THE EXISTING 400A SERVICE ENTRANCE RATED SWITCH.
7. THE ELECTRICAL CONTRACTOR IS TO REMOVE EXISTING CONDUIT AND WIRING FROM EXISTING 30kW GENERATOR TO PANEL B.
8. THE CONDUIT AND WIRING FEEDING PANEL C FROM PANEL IS EXISTING TO REMAIN.



2 NEW WORK SINGLE LINE RISER DIAGRAM

NOT TO SCALE

SINGLE LINE RISER CONDUIT/WIRING LEGEND

- EXISTING CONDUIT AND WIRING TO REMAIN
- E — NEW CONDUIT AND WIRING FOR EMERGENCY CIRCUITS
- P — NEW CONDUIT AND POWER WIRING
- LV — NEW CONDUIT AND LOW VOLTAGE WIRING (CONDUIT AND WIRING AS SPECIFIED BY THE MANUFACTURER)

NEW WORK GENERAL NOTES

1. THE ELECTRICAL CONTRACTOR SHALL ASSIGN A 2A10BC FIRE EXTINGUISHER WITHIN 10 FEET (BOTH ACCESSIBLE AND VISIBLE) FROM THE GENERATOR AND AUTOMATIC TRANSFER SWITCH.
2. THE ABOVEGROUND STORAGE TANK MUST HAVE ATMOSPHERIC PIPING A MINIMUM OF 10 FEET ABOVE THE TANK.

NEW WORK SHEET NOTES

1. THE ELECTRICAL CONTRACTOR IS TO PROVIDE AND INSTALL THE NEW 400A NEMA 3R AUTOMATIC TRANSFER SWITCH ON THE EAST EXTERIOR WALL OF THE FIRE STATION AS SHOWN.
2. THE ELECTRICAL CONTRACTOR IS TO ROUTE CONDUIT AND WIRING UNDERGROUND FROM THE NEW 400A AUTOMATIC TRANSFER SWITCH TO THE EXISTING APCo METER AS SHOWN.
3. THE ELECTRICAL CONTRACTOR IS TO FIELD ROUTE CONDUIT AND WIRING FROM THE NEW 60kW GENERATOR TO PANEL B ON THE SOUTH WALL OF THE BUILDING INTERIOR TO PROVIDE POWER FOR THE GENERATOR BLOCK HEATER AND BATTERY CHARGER. ALL BUILDING PENETRATIONS ARE TO BE PROPERLY SEALED.
4. THE ELECTRICAL CONTRACTOR IS TO ROUTE CONDUIT AND WIRING ALONG BUILDING EXTERIOR FROM THE NEW 400A AUTOMATIC TRANSFER SWITCH TO THE NEW GENERATOR AS SHOWN.
5. THE ELECTRICAL CONTRACTOR IS TO ROUTE 1" CONDUIT AND CONTROL WIRING AS SPECIFIED BY THE MANUFACTURER ALONG THE BUILDING EXTERIOR FROM THE NEW AUTOMATIC TRANSFER SWITCH TO THE NEW GENERATOR AS SHOWN.
6. MAINTAINED OPERATOR PUSHBUTTON STATIONS. RED BUTTON IN STEEL NEMA 3R LOCKABLE BOX. LABEL WITH A RED MYCARTA PLACARD WITH 1" WHITE LETTERING;
   "GENERATOR EMERGENCY STOP"
   THE ELECTRICAL CONTRACTOR IS TO PROVIDE AND INSTALL 1" CONDUIT AND CONTROL WIRING ALONG THE BUILDING EXTERIOR AS SPECIFIED BY THE MANUFACTURER.
7. THE ELECTRICAL CONTRACTOR IS TO PROVIDE (4#500kcmil, 1#3G, 4" CONDUIT) EXTEND, AND/OR MODIFY THE EXISTING FEEDER FOR PANEL B TO THE APPROPRIATE LINE LUGS ON THE NEW 400A AUTOMATIC TRANSFER SWITCH AND TERMINATE.
8. CONNECT #3/0 TINNED STRANDED BARE COPPER CONDUCTOR TO THE BUILDING GROUND ELECTRODE SYSTEM BUILDING STEEL, GROUND RODS, WATER PIPE.
9. THE ELECTRICAL CONTRACTOR IS TO INSTALL A NEW 100A 3-POLE BREAKER IN PANEL B AS WELL AS NEW CONDUIT AND WIRING (4#3, 1#8G, 1 1/2" CONDUIT) TO FEED PANEL A.

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SHEET TITLE: ELECTRICAL RISER DIAGRAMS

SHEET: E-4.1