



**BID DOCUMENTS FOR**

**HILLGROVE WATER TREATMENT PLANT  
EMERGENCY GENERATOR SET**

**BID NO. 2376**

CITY OF CONCORD  
WATER RESOURCE DEPARTMENT  
635 ALFRED BROWN JR COURT, POST OFFICE BOX 308  
CONCORD, NORTH CAROLINA 28026-0308

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## **SECTION I**

### **BIDS, AGREEMENTS, AND NOTICES**

**BID ADVERTISEMENT/INVITATION TO BID**

Date: **January 14<sup>th</sup>, 2019**

Project Title:       **Hillgrove Water Treatment Plant  
Emergency Generator Set  
Bid# 2376**

Project Description:   The **Hillgrove Water Treatment Plant Emergency Generator Set** project consists of the supply and installation of an emergency backup generator package.

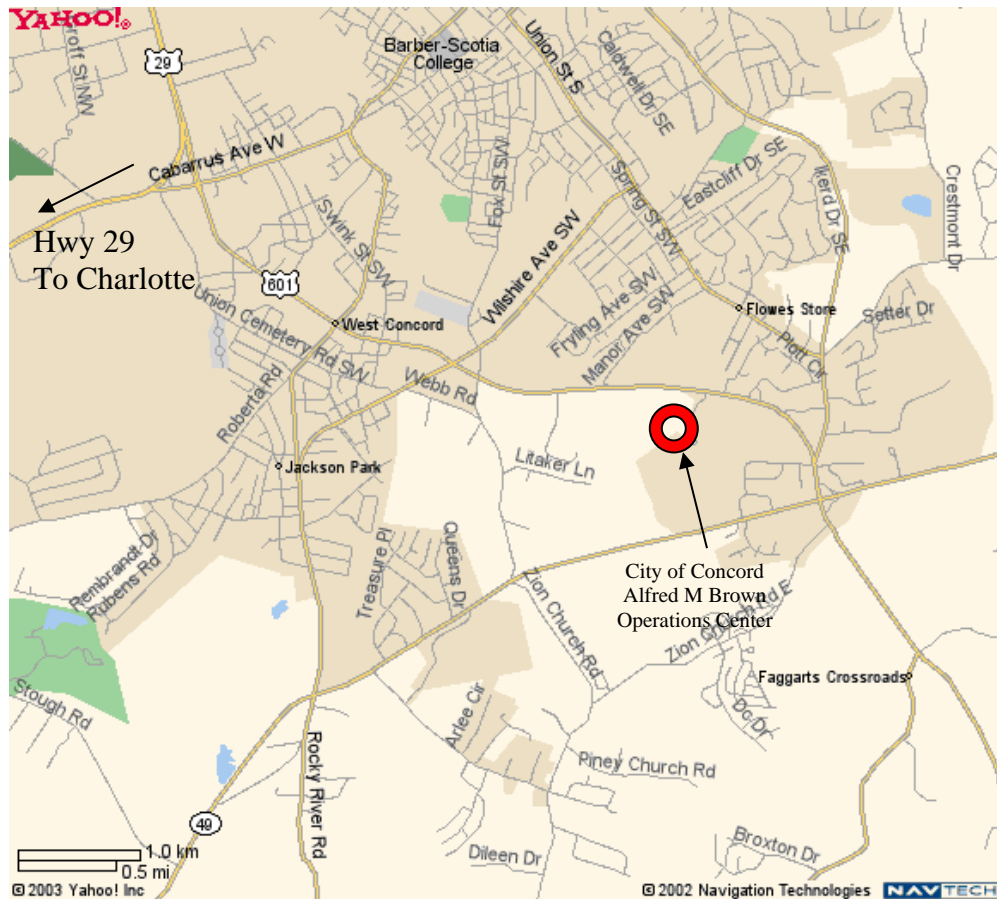
Sealed Bids will be received by the City of Concord (Owner) at the address below. Please submit notarized bids in a sealed envelope by the bid opening time and date. All Bids must be in accordance with the Bidding Documents on file with the City of Concord Purchasing Department. Bidders must be licensed contractors in the State of North Carolina. Bids will be received on a unit price basis. A Bid Bond must accompany each bid. The Successful Bidder will be required to furnish a Construction Performance Bond and a Construction Payment Bond as security for the faithful performance and the payment of all bills and obligations arising from the performance of the Contract. Contractor and all Subcontractors will be required to conform to the labor standards set forth in the Contract Documents. Owner reserves the right to reject any or all Bids, including without limitation the rights to reject any or all nonconforming, nonresponsive, unbalanced, or conditional Bids, and will award to lowest responsible Bidder taking into consideration quality, performance, and time specified in Bid Form for performance of Work. Owner also reserves the right to waive informalities.

Contractors wishing to bid on this project must register to bid by sending an email to Ryan LeClear at [leclear@concordnc.gov](mailto:leclear@concordnc.gov). Registration for bidding requires the name of the company, physical address, contact email address, and telephone number. All communication regarding this bid will be done through email.

**Technical questions:** Contact Rusty Campbell ([campbellr@concordnc.gov](mailto:campbellr@concordnc.gov)) 704.920.5164

Bid Due Date:       **Tuesday, February 19<sup>th</sup> at 2:00 PM**  
Location:           City of Concord, Alfred M. Brown Operations Center  
635 Alfred Brown Jr Court  
Conference Room C, Concord, NC 28026  
(See attached map/directions)

## MAP AND DIRECTIONS TO CITY OF CONCORD ALFRED M BROWN OPERATIONS CENTER



### Directions from Charlotte

- Take I-77 north to I-85 north from Charlotte to Concord.
- From I-85 north, take exit 49 to the right towards Lowe's Motor Speedway.
- At the Lowe's Motor Speedway, turn left onto Highway 29 (Concord Pkwy) north.
- Keep going north while you pass the Wal-Mart shopping center on your right.
- Turn right at the light at the Chevrolet dealership onto Cabarrus Avenue.
- Turn right at the next traffic light at the Walgreens onto Hwy 601 South (bypass).
- (Hwy 601 S is also Warren C. Coleman Boulevard).
- Go straight through two traffic lights at Old Charlotte Road and Wilshire Avenue.
- Pass the Bi-Lo shopping center on your left.
- Turn right at the next traffic light at Manor Avenue (blue & white sign on right for the City of Concord Alfred M. Brown Operations Center).
- You will be on the entrance road into our complex.
- Follow signs to the left to Visitor Parking.
- Proceed to the front desk at the Administration Building and sign in with the receptionist.

## **INSTRUCTIONS TO BIDDERS**

1. **DEFINED TERMS.** Terms used in these Instructions to Bidders are meanings assigned to them in the General Conditions and the Supplementary Conditions. An additional term is defined as follows:

Successful Bidder - The lowest, qualified, responsible, and responsive Bidder to whom Owner (on the basis of Owner's evaluation as herein provided) makes an award.

2. **COPIES OF BID DOCUMENTS.** Bid Documents may be obtained from the Owner via the link below for the City of Concord's website.

<b>Complete set of Bid Documents</b>	<u>Charge</u> <b>Free download</b>
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<http://www.concordnc.gov/Departments/Finance/Purchasing/RFPs-and-Bids>

Partial sets of Bid Documents will not be issued in response to requests by subject matter.

Complete sets of Bid Documents must be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misrepresentations resulting from the use of incomplete sets of Quoting Documents.

Owner and Engineer, in making copies of Quoting Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other use.

3. **QUALIFICATIONS OF Bidders.** To demonstrate qualifications to perform the Work, Bidder may be required to submit written evidence on financial data, previous experience, present commitments, and other such data as may be requested by Owner or Engineer. Each Bid must contain evidence of Bidder's qualification to do business in the state where the Project is located, or Bidder must agree to obtain such qualification prior to award of the Contract.

4. **EXAMINATION OF CONTRACT DOCUMENTS AND SITE.** It is the responsibility of each Bidder, before submitting a Bid, to (a) thoroughly examine the Contract Documents, (b) visit the site to become familiar with local conditions that may affect cost, progress, performance, or furnishing of the Work, (c) consider federal, state, and local laws and regulations that may affect cost, progress, performance, or furnishing of the Work, (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify Engineer of all conflicts, errors, or discrepancies discovered by Bidder in the Contract Documents.

4.02. **Underground Facilities.** Information and data reflected in the Contract Documents with respect to underground facilities at or contiguous to the site are based upon information and data furnished to Owner and Engineer by owners of such underground facilities or others, and Owner and Engineer disclaim responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in the Supplementary Conditions.

4.03. **Additional Information.** Before submitting a Bid, each Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests, and studies and obtain any additional information and data which pertain to the physical conditions (surface, subsurface, and underground facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance, or furnishing of the Work and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of the Contract Documents.

On request 24 hours in advance, Owner will provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the site to its former condition upon completion of such explorations. Arrangements for site visits shall be made by calling the office of the Rusty Campbell, Water Treatment Plant Superintendent at 704.920.5164

4.04. Easements. The lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and other lands designated for use by Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by Contractor. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by Owner unless otherwise specified in the Contract Documents.

4.05. Unit Price Contracts. Bidders must satisfy themselves of the accuracy of the estimated quantities in the Bid schedule by examination of the site and a review of the drawings and the specifications, including the addenda. After Bids have been submitted, the Bidder shall not assert that there was a misunderstanding concerning the quantities of work or the nature of the work to be done.

4.06. Bidder's Representation. The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement concerning examination of the Contract Documents and the site, that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

5. INTERPRETATIONS AND ADDENDA. All questions about the meaning or intent of the Quoting Documents and the Contract Documents shall be submitted to Owner in writing. Interpretations or clarifications considered necessary by Owner in response to such questions will be issued by Addenda, emailed or delivered to all parties recorded by Engineer as having received the Quoting Documents. Questions received less than 10 days prior to the date for opening of Bids may not be answered. Only answers issued by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

6. **BID SECURITY. Each Proposal must be accompanied by a deposit equal to 5% of the net price bid.** This deposit may consist of cash, or a Cashier's Check issued by, or a Certified Check drawn on a Bank or Trust Company authorized to do business in North Carolina, or on a Bank insured by the Federal Deposit Insurance Corporation, or a U.S. Money Order, payable to the City of Concord or 5% Bid Bond in the form required by G.S. 143-129 as amended, issued by an Insurance Company authorized to do business in North Carolina, said deposit to be retained in the event of failure of the successful bidder to execute a formal contract within ten (10) days after award or to give satisfactory surety required.

The Bid security of the Successful Bidder (if so required) will be retained until such Bidder has executed the Agreement, furnished the required contract security (if so required), and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Agreement and furnish the required contract security within the number of days set forth in the Bid Form, Owner may annul the Notice of Award and the Bid security of that Bidder will be forfeited. The Bid security (if so required) of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Agreement or the day after the last day the Bid remains subject to acceptance as set forth in the Bid Form, whereupon Bid security furnished by such Bidders will be returned. Bid security accompanying Bid which are deemed by Owner to be noncompetitive will be returned within 7 days after the designated Bid opening.

7. CONTRACT TIMES. The numbers of calendar days within which, or the dates by which, the Work is to be substantially completed and also completed and ready for final payment (the Contract Times) are set forth in the Bid Form.

8. LIQUIDATED DAMAGES. Provisions for liquidated damages, if any, are set forth in the Agreement.

9. SUBSTITUTES OR "OR-EQUAL ITEMS. Bidder's attention is directed to Article 6.5 of the General Conditions concerning substitutes and "or-equal" items. Where an item or material is specified by a proprietary name, it is done for the purpose of establishing a basis of quality and not for the purpose of limiting competition. The Engineer's intent is to consider alternative products which have the desired essential characteristics. The Engineer will consider any such products offered. Requests for acceptance of alternative products shall be made through Bidders quoting as prime Contractors. Acceptances for substitutions will not be granted directly to suppliers, distributors, or subcontractors. Pursuant to Section 133-3, General Statutes of North Carolina, the following procedures shall be used:

Bidders desiring to submit alternative product proposals for prior acceptance of the Engineers shall submit, in writing, such proposals two (2) weeks in advance of the bid due date. Applications received after this time will not be reviewed. Each such request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute, including drawings, cuts, performance and test data, and other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment, or other work that incorporation of the substitute would require shall be included. The Engineer shall consider and either accept or reject all alternative product proposals submitted.

If, by the close of the fifth day prior to the deadline for receiving Bid, the Engineer has accepted any alternative product proposals, the Quoting Documents shall be modified to include the alternative products. The Engineer shall publish the modification in an Addenda at least 5 days prior to the deadline for receiving Bids. The Engineer's decision of acceptance or rejection of a proposed substitute shall be final.

10. SUBCONTRACTORS, SUPPLIERS, AND OTHERS. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, and other persons and organizations (including those who are to furnish the principal items of material and equipment) to be submitted to Owner in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within 3 days after the opening submit to Owner the List of Subcontractors completed with all such Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work for which such identification is required. The list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, person, or organization, if requested by Owner. If Owner or Engineer after due investigation has reasonable objection to any proposed Subcontractor, Supplier, or other person or organization, Owner may, before the Notice of Award is given, request the apparent Successful Bidder to submit an acceptable substitute without an increase in the Bid.

All Subcontractors shall be a licensed utility contractor in the State of North Carolina.

11. BID FORM. The Bid Form is bound in the Quoting Documents and shall not be removed therefrom. Bid Forms must be completed in ink.

Bids by corporations must be executed in the corporate name by the president or vice-president (or other corporate officer accompanied by evidence of authority to sign for the corporation). Bids by partnerships must be executed in the partnership name and signed by a partner. Bids by joint ventures shall be signed by each participant in the joint venture or by a representative of the joint venture accompanied by evidence of authority to sign for the joint venture.



The names of all persons signing shall be legibly printed below the signature. A Bid by a person who affixes to his signature the word "president", "secretary", "agent", or other designation without disclosing his principal may be held to be the Bid of the individual signing. When requested by Owner, evidence of the authority of the person signing shall be furnished.

All blanks in the Bid Form shall be filled. A Bid price shall be indicated for each unit price item listed therein, or the words "No Bid", "No Charge", "No Change", or other appropriate phrase shall be entered.

The Bid shall contain an acknowledgment of receipt of all Addenda; the numbers and dates of which shall be filled in on the Bid Form.

No alterations in Bids, or in the printed forms therefore, by erasures, interpolations, or otherwise will be acceptable unless each such alteration is signed or initialed by the Bidder; if initialed, Owner may require the Bidder to identify any alteration so initialed.

11.01. Bid Pricing. The Bidder shall complete the schedule of unit prices included in the Bid Form and shall accept all fixed unit prices listed therein.

The total Bid will be determined as the sum of the products of the estimated quantity of each item and the unit price Bid. The final Contract Price will be subject to adjustment according to final measured, used, or delivered quantities as provided in Article 9.7 of the General Conditions, and the unit prices in the Bid will apply to such final quantities except that unit prices will be subject to change by Change Order as stipulated in the Supplementary Conditions.

11.02. Contingency. The Contingency is to be added to the Bid price and is to be used for minor change order items. If the Contingency is to be used, a scope of work and price would be negotiated. The Contingency is for the sole use of Owner. A change order will be issued to delete any unauthorized portion of the Contingency.

12. SUBMISSION OF BIDS. Bids shall be submitted at the time and place indicated in the Invitation to Bid, or the modified time and place indicated by Addendum. Bids shall be enclosed in a sealed envelope or wrapping, addressed to:

The City of Concord  
Ryan LeClear, Purchasing Department Manager  
P.O. Box 308  
635 Alfred Brown Jr Court  
Concord, North Carolina 28026-0308

Bids shall be marked with the name, license number and address of the Bidder and shall be accompanied by the Bid security (if required) and other required documents. If the Bid is sent through the mail or other delivery system, the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of it.

Each Bid envelope shall be identified on the outside with the words:

**“BID# 2376 – EMERGENCY GENERATOR SET”**

Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

**One copy of all pages of the BID FORM must be submitted with the Bid, as well as a Bid Bond and Debarred Firms Certification Form.**

Oral, telephone, facsimile, or telegraph Bids are invalid and will not receive consideration.

No Bidder may submit more than one Bid. Multiple Bids under different names will not be accepted from one firm or association.

A conditional or qualified Bid will not be accepted.

13. MODIFICATION AND WITHDRAWAL OF BIDS. Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.

If, within 24 hours after Bids are opened, any Bidder files a duly signed, written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid and the Bid security (if any) will be returned. Thereafter, that Bidder will be disqualified from further quoting on the Work to be provided under the Contract Documents.

14. OPENING OF BIDS. Bids will be opened at the office and at the discretion of the Project Manager and Purchasing Manager, then read aloud.

The procedure for opening Bids will follow guidelines issued by the State Building Commission dated December 10, 1990, and endorsed by the Consulting Engineers Council of North Carolina.

15. BIDS TO REMAIN SUBJECT TO ACCEPTANCE. All Bids will remain subject to acceptance for the number of days set forth in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the security (if any) prior to that date.

16. AWARD OF CONTRACT. Owner reserves the right to reject any or all Bids, including without limitation the rights to reject any or all nonconforming, nonresponsive, unbalanced, or conditional Bids, and will award to lowest responsible Bidder taking into consideration quality, performance, and time specified in Bid Form for performance of Work. Owner also reserves the right to waive informalities.

In evaluating Bids, Owner will consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and such alternatives, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

Owner may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in the Supplementary Conditions. Owner also may consider the operating costs, maintenance requirements, performance data, and guarantees of major items of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award.

Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.

If the Contract is to be awarded, it will be awarded to the lowest Bidder whose evaluation by Owner indicates to Owner that the award will be in the best interests of Owner. If the Contract is to be awarded, Owner will give the Successful Bidder a Notice of Award within the number of days set forth in the Bid

Form. The evaluation of Suppliers' or manufacturers' data submitted with the Bid, or submitted upon request prior to the Notice of Award, will include consideration of the following:

- Owner-required inventory of spare parts.
- Building design changes which would be required to accommodate the proposed materials and equipment.
- Installation requirements and related engineering, training, and operating costs.
- Experience and performance record of the Supplier or the manufacturer.
- Maintenance and frequency of inspections required to assure reliable performance of the equipment.
- Suppliers' or manufacturers' service facilities and availability of qualified field service personnel.
- Efficiency and related operating expense during the anticipated useful life of the equipment.

17. CONTRACT SECURITY. The General Conditions set forth Owner's requirements as to Performance and Payment Bonds (required). These Bonds shall be delivered to Owner with the executed Agreement.

18. SIGNING OF AGREEMENT. When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by two unsigned counterparts of the Agreement with all other written Contract Documents attached. Within the number of days set forth in the Bid Form, the Successful Bidder shall sign, leaving the dates blank, and deliver the required number of counterparts of the Agreement and attached documents to Owner with the required Bonds and power of attorney. Within 30 days thereafter, Owner shall execute all copies of the Agreement and other Contract Documents submitted by Contractor (Successful Bidder); shall insert the date of contract on the Agreement, Bonds, and power of attorney; and shall distribute signed copies as stipulated in the Agreement.

Should the Owner not execute the Contract within the period specified, the Successful Bidder may, by written notice, withdraw his signed Contract. Such notice or withdrawal shall be effective upon receipt of the notice by the Owner.

19. SALES AND USE TAXES. Provisions for sales and use taxes, if any, are set forth in the Supplementary Conditions.

20. RETAINAGE. Provisions concerning retainage are set forth in the Agreement.

21. LAWS AND REGULATIONS. Modifications, if any, to the General Conditions concerning Laws and Regulations are set forth in the Supplementary Conditions. Additional provisions, if any, concerning Laws and Regulations are set forth in the Agreement.

21.01. Collusive Bidding. In accordance with Section 112(c) of Title 23 USC, and G.S. 75-5(b)(7) of the State of North Carolina, the Contractor (Bidder), by submission and execution of this bid or Bid, certifies that he has not entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding or quoting in connection with his Bid on this project.

End of Section

DEBARRED FIRMS CERTIFICATION FORM

**Hillgrove Water Treatment Plant Emergency Generator Set  
Bid# 2376**

The undersigned hereby certifies that the firm of \_\_\_\_\_ has not been suspended by the State of North Carolina or any agency or department thereof for conviction or indictment or any of the offenses enumerated in G.S. 133-27 nor will award subcontracts of any tier to firms that have been suspended for conviction or indictment of any of the offenses enumerated in G.S. 133-27.

\_\_\_\_\_  
Name of Firm

ATTEST \_\_\_\_\_ (SEAL)

\_\_\_\_\_  
Signature of Authorized Official

\_\_\_\_\_  
Title

Sworn and subscribed before me this  
\_\_\_\_\_ day of \_\_\_\_\_, 2018

\_\_\_\_\_  
Notary Public

**EXHIBIT A – BID FORM**

PROJECT IDENTIFICATION:

**Hillgrove Water Treatment Plant  
Emergency Generator Set  
Bid# 2376**

THIS BID IS SUBMITTED TO:

Ryan LeClear, Purchasing Department Manager  
City of Concord  
635 Alfred Brown Jr Court, P.O. Box 308  
Concord, North Carolina 28026-0308

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an agreement with Owner in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents within the specified time and for the amount indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.
2. Bidder accepts all of the terms and conditions of the Invitation to Bid and the Instructions to Bid, including without limitation those dealing with the disposition of the Bid security (if security is required by the City Manager)
3. This Bid will remain subject to acceptance for 60 days after the day designated for reception of Bids. Bidder will sign and submit the Agreement with the Bonds and other documents required by the Quoting Documents within 10 days after the date of Owner's Notice of Award.
4. In submitting this Bid, Bidder represents that:

- a. Bidder has examined copies of all the Quoting Documents and of the following Addenda (receipt of all which is hereby acknowledged):

No. \_\_\_\_\_ Dated \_\_\_\_\_

No. \_\_\_\_\_ Dated \_\_\_\_\_

No. \_\_\_\_\_ Dated \_\_\_\_\_

No. \_\_\_\_\_ Dated \_\_\_\_\_

No. \_\_\_\_\_ Dated \_\_\_\_\_

- b. Bidder has visited the site and become familiar with and satisfied itself as to the general, local, and site conditions that may affect cost, progress, performance, and furnishing of the Work.
- c. Bidder is familiar with and has satisfied itself as to all Federal, State, and Local Laws and Regulations that may affect cost, progress, performance, and furnishing of Work.

- d. Bidder has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except underground facilities) which have been provided by the owner and under the conditions normally used and identified in the Supplementary Conditions and Special Conditions as provided in Paragraph 4.2.1 of the General Conditions. Bidder accepts the determination set forth in the Supplementary Conditions and Special Conditions of the extent of the "technical data" contained in such reports and drawings upon which Bidder is entitled to rely as provided in Paragraph 4.2 of the General Conditions. Bidder acknowledges that such reports and drawings are not Contract Documents and may not be complete for Bidder's purposes. Bidder acknowledges that Owner and Engineer do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Quoting Documents with respect to underground facilities at or contiguous to the site. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance, or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder and safety precautions and programs incident thereto. Bidder does not consider that any additional examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance and furnishing of the Work in accordance with the time, price, and other terms and conditions of the Contract Documents.
  - e. Bidder is aware of the general nature of Work to be performed by Owner and others at the site that relates to Work for which this Bid is submitted as indicated in the Contract Documents.
  - f. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.
  - g. Bidder has given Engineer written and verbal notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Contract Documents and the written resolution thereof by Engineer is acceptable to Bidder, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.
  - h. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm, or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization, or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any person, firm, or corporation to refrain from quoting; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.
5. Bidder will complete the Work for the following unit prices.

**EXHIBIT A – BID FORM**

**Hillgrove Water Treatment Plant  
Emergency Generator Set  
Bid# 2376**

City of Concord  
P.O. Box 308  
Concord, North Carolina

The undersigned, as bidder, hereby declares the proposal is made without connection with any other person, company, or parties making a similar bid or proposal, and that it is in all respects fair and in good faith without collusion or fraud. The Bidder has carefully examined the annexed form of the specifications in Exhibit B and instructions to the bidder and hereby declares that he will furnish the material and services called for in a manner prescribed in the specifications and instructions to bidders for the following price listed.

COMPLETE PROJECT PRICE \_\_\_\_\_

DELIVERY DATE/ DAYS \_\_\_\_\_

COMPANY NAME \_\_\_\_\_

AUTHORIZED SIGNATURE \_\_\_\_\_

TYPE NAME AND TITLE \_\_\_\_\_

FEDERAL ID # \_\_\_\_\_

TELEPHONE # \_\_\_\_\_

6. Bidder agrees that all work will be completed and ready for final payment in accordance with Paragraph 14.13 of the General Conditions within 60 days from the date of notice to proceed.
7. Liquidated damages are \$250.00 per each day past the contract completion date.
8. Communications concerning this Bid shall be sent to Bidder at the following address:

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

P.O. BOX: \_\_\_\_\_

CITY: \_\_\_\_\_

STATE: \_\_\_\_\_

ZIP: \_\_\_\_\_

9. The terms used in this BID, which are defined in the General Conditions (Section II), have the meanings assigned to them in the General Conditions.

SIGNATURE OF BIDDER: \_\_\_\_\_

Contractor's License Number \_\_\_\_\_

License Expiration Date \_\_\_\_\_

If an Individual

By \_\_\_\_\_  
(signature of individual)

doing business as \_\_\_\_\_

Business address \_\_\_\_\_

Phone No. \_\_\_\_\_

Date \_\_\_\_\_, 20\_\_\_\_

ATTEST \_\_\_\_\_ TITLE

If a Partnership

By \_\_\_\_\_  
(firm name)

\_\_\_\_\_  
(signature of general partner)

Business address \_\_\_\_\_

Phone No. \_\_\_\_\_



Date \_\_\_\_\_, 20\_\_\_\_\_

ATTEST \_\_\_\_\_ TITLE \_\_\_\_\_

**If a Corporation**

By \_\_\_\_\_  
(corporation name)

By \_\_\_\_\_  
(signature of authorized person) (title) \_\_\_\_\_

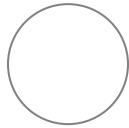
Business address \_\_\_\_\_

Phone No. \_\_\_\_\_

Date \_\_\_\_\_, 20\_\_\_\_\_

ATTEST \_\_\_\_\_ TITLE \_\_\_\_\_

(Seal)



**If a Joint Venture (Other party must sign below.)**

By (name) \_\_\_\_\_

Contractor's License Number \_\_\_\_\_

License Expiration Date \_\_\_\_\_

**If an Individual**

By \_\_\_\_\_  
(signature of individual)

doing business as \_\_\_\_\_

Business address \_\_\_\_\_

Phone No. \_\_\_\_\_

Date \_\_\_\_\_, 20\_\_\_\_\_

ATTEST \_\_\_\_\_ TITLE \_\_\_\_\_

**If a Partnership**

By \_\_\_\_\_  
(firm name)

\_\_\_\_\_

(signature of general partner)  
Business address \_\_\_\_\_

Phone No. \_\_\_\_\_

Date \_\_\_\_\_, 20\_\_\_\_

ATTEST \_\_\_\_\_ TITLE \_\_\_\_\_

If a Corporation

By \_\_\_\_\_  
(corporation name)

By \_\_\_\_\_  
(signature of authorized person)(title)\_\_\_\_\_

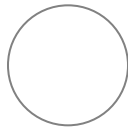
Business address \_\_\_\_\_

Phone No. \_\_\_\_\_

Date \_\_\_\_\_, 20\_\_\_\_

ATTEST \_\_\_\_\_ TITLE \_\_\_\_\_

(Seal)



# **EXHIBIT B – SPECIFICATIONS**

## **Package Generator Set**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Controls and Instrumentation, System Commissioning and Division 01 Specification Sections, apply to this section.

#### **1.2 SUMMARY**

- A. This section includes packaged engine-generator sets for emergency power with the following features:
  - 1. Diesel engine
  - 2. Unit mounted cooling system
  - 3. Unit mounted control and monitoring with connections to building BMS
  - 4. Performance requirements for sensitive loads
  - 5. Fuel system
  - 6. Transfer Switch
  - 7. Outdoor enclosure
  - 8. Exhaust
  - 9. Mounting

#### **1.4 REFERENCES**

- A. The generator set and all components shall be designed, manufactured, and tested in accordance with the latest applicable standards as follows:
  - 1. National Electric Code (NEC) – National Fire Protection Association (NFPA) 70
  - 2. NFPA 99, NFPA 110
  - 3. American National Standards Institute (ANSI)
  - 4. Underwriters Laboratories (UL)
  - 5. Institute of Electrical and Electronics Engineers (IEEE)

#### **1.5 ACTION SUBMITTALS**

- A. Bill of Materials: A listing shall include all panels, racks, instruments, components, and devices provided under this section
- B. Product Data: For each type of package engine generator indicated. Drawings and descriptive (catalog) data and brochures of each item of equipment including technical data sheets for the engine and generator
  - 1. Diesel engine data
    - a. Manufacturer
    - b. Model
    - c. Revolutions per minute (RPM)

- d. Rated capacity brake horsepower (bhp)
  - e. Make and model of governor
  - f. Piston displacement (cubic inches)
  - g. Fuel consumption rate in gallons per hour at:
    - 1) Full load
    - 2) 3/4 load
    - 3) 1/2 load
2. Generator data
- a. Manufacturer
  - b. Model
  - c. Rated kVA
  - d. Rated kW
  - e. Voltage
  - f. Temperature rise above 40°C ambient at rated output with 0.8 power factor
  - g. Motor starting capability (skVA) at 30% instantaneous voltage dip (motor starting at 90% rated voltage will not be accepted)
  - h. Generator efficiency including excitation losses at:
    - 1) Full load
    - 2) 3/4 load
    - 3) 1/2 load
3. Package data
- a. Overall length, width, and height
  - b. Weight of complete skid mounted unit
  - c. Exhaust pipe size
  - d. Air flow (in cubic feet per minute) of air required for combustion and ventilation
  - e. Heat rejection to the atmosphere of the engine and generator in BTU/hr
  - f. Cooling air volume required
  - g. Emissions certification
  - h. Sound data
4. Engine-generator unit and accessories to include:
- a. Enclosure
  - b. Accessory sub-panel & transformer
  - c. Control panels
  - d. Voltage regulator
  - e. Fuel system
  - f. Exhaust system

- g. Batteries
- h. Battery charger
- i. Jacket water heater
- 5. Generator circuit breaker
  - a. Catalog data
  - b. Recommended trip settings for all adjustable settings
  - c. Short circuit interrupt ratings
- C. 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 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.

#### **1.6 INFORMATIONAL SUBMITTALS**

- A. Sizing calculation: Generator supplier to submit a project specific sizing calculation for engineering review and approval. Loading as shown on the electrical drawings.
- B. Manufacturer Seismic Qualification Certification: Submit IBC certification that engine-generator set, batteries, battery racks, accessories, and components will withstand seismic forces defined in Division 26 Section "Vibration and Seismic Controls for Electrical Systems." Include the following:
  - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
    - a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
  - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements
- C. Qualification Data: For installer, manufacturer, and testing agency
- D. Source quality-control test reports
  - 1. Certified summary of prototype-unit test report.
  - 2. Certified Test Reports: For components and accessories that are equivalent, but not identical, to those tested on prototype unit.
  - 3. Report of factory test on units to be shipped for this Project, showing evidence of compliance with specified requirements.
  - 4. Report of sound generation.

- 5. Factory EPA Certificate showing compliance with applicable federal regulations.
- 6. Certified Torsional Vibration Compatibility: Comply with NFPA 110.
- E. Field quality control test report
- F. Warranty: Special warranty specified in this Section
- G. Operation and Maintenance Data: For packaged engine generators to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
  - 1. List of tools and replacement items recommended to be stored at Project for ready access. Include part and drawing numbers, current unit prices, and source of supply.

**1.7 MAINTENANCE MATERIAL**

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents
  - 1. Fuses: One for every ten of each type and rating, minimum one fuse of each type.

**1.8 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 four (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 Qualifications: A qualified manufacturer with a minimum of 25 years' experience building the specified products. The manufacture shall maintain, 30 miles of Project site, a factory authorized and trained service center capable of providing training, parts, and emergency maintenance repairs.
- C. Source Limitations: Obtain packaged generator sets and auxiliary components through one source from a single manufacturer.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- E. Comply with ASME B15.1.
- F. Comply with NFPA 37.
- G. Comply with NFPA 70.
- H. Comply with NFPA 99.
- I. Comply with NFPA 110 requirements for Level 1 and Level 2 emergency / legally required power supply systems.
- J. Listed to UL 2200 (600V generator output and below)
- K. Exhaust Emissions: Comply with applicable federal, state, and local emissions requirements at the time of installation and commissioning.
- L. Sound emissions: Comply with applicable local sound requirements

**1.9 PROJECT 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 25°C to plus 50 °C.
  - 2. Altitude: Sea level to 3000 ft.

#### **1.10 WARRANTY**

- A. Two Year Standby / Mission Critical Generator Set Warranty
  - 1. The manufacturer's standard warranty shall in no event be for a period of less than two (2) years from date of initial start-up of the system and shall include repair parts, labor, reasonable travel expense necessary for repairs at the job site, and expendables (lubricating oil, filters, antifreeze, and other service items made unusable by the defect) used during the course of repair. Running hours shall be limited to 500 hours annually for the system warranty by both the manufacturer and servicing distributor. Submittals received without written warranties as specified will be rejected in their entirety.

#### **1.11 MAINTENANCE SERVICE**

- A. The engine generator supplier shall maintain 24 hour parts and service capability within 50 miles of the project site. The distributor shall stock parts as needed to support the generator set package for this specific project. The distributor shall carry sufficient inventory to cover no less than 80% of the parts service within 24 hours and 95% within 48 hours.

### **PART 2 – PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide product by one of the following:
  - 1. Caterpillar Inc.
  - 2. Cummins Power
  - 3. MTU Onsite Energy
- B. Basis-of-Design Product: Subject to compliance with requirements, provide a Caterpillar C18, 600 kW diesel generator set. The power system has been designed to the specified manufacturer's electrical and physical characteristics. The equipment sizing, spacing, amounts, electrical wiring, ventilation equipment, fuel, and exhaust components have all been sized and designed around Caterpillar supplied equipment. Should any substitutions be made, the CONTRACTOR shall bear responsibility for the installation, coordination and operation of the system as well as any engineering and redesign costs, which may result from such substitutions.

#### **2.2 ENGINE-GENERATOR SET**

- A. One (1) new C18, 600kW EPA Tier 2 Caterpillar generator set manufactured, factory-assembled and tested engine-generator set. The generator set shall EPA Stationary Emergency application.
- B. The electric power generating system shall consist of one 600 kW, 750.0 kVA, 0.8 power factor, 600 volts, Wye connected, 3-Phase, 4 wire, 60 hertz generator systems. Motor starting at 90% rated sustained voltage will not be accepted. Generator set shall be rated for Standby applications with typical usage of 500 hours per year.

- D. Engine power shall not de-rate up to 50°C at sea level and shall be capable of providing 600 kW, at 77°F (25.0°C) and altitude of 500.0 feet (152.4 m).
- E. Mounting Frame: Maintain alignment of mounted components without depending on concrete foundation, with provisions for lifting attachments.
  - 1. Rigging diagram shall be permanently attached to the generator set package to indicate location and lifting capacity of each lifting attachment and generator-set center of gravity
- F. Capacities and Characteristics:
  - 1. Power Output Ratings: 600 ekW / 750.0 kVA
  - 2. Output Connections: 600 volt three-phase, four wire
- G. Nameplates: For each major system component, identify manufacturer's name, model, and serial number of component
- H. Generator set performance:
  - 1. Steady-State Voltage Operational Bandwidth: 3 percent of rated output voltage from no load to full load.
  - 2. Transient Voltage Performance: Not more than 20 percent variation for 50 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within three seconds.
  - 3. Steady-State Frequency Operational Bandwidth: 0.5 percent of rated frequency from no load to full load.
  - 4. 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.
  - 5. Transient Frequency Performance: Less than 5 percent variation for 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within five seconds.
  - 6. Output Waveform: At no load, harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent for single harmonics. Telephone influence factor, determined according to NEMA MG 1, shall not exceed 50 percent.
  - 7. Sustained Short-Circuit Current: For a 3-phase, bolted short circuit at system output terminals, system shall supply a minimum of 250 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to generator system components.
  - 8. Start Time: Comply with NFPA 110, Type 10, system requirements.

### **2.3 ENGINE**

- A. Fuel: Fuel oil, Grade DF-2 ULS type
- B. Rated engine speed: 1800 RPM
- C. Lubrication system: The following items are mounted on engine or base rails:
  - 1. Filter and strainer: Oil filters rated to remove 90% of particles 5 micrometers and smaller while passing full flow
  - 2. Lube oil pump
  - 3. Oil level regulator
  - 4. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassemble and without use of pumps, siphons, special tools, or appliances
- D. 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.
  3. Provide water separator on engine.
- E. Coolant Jacket Heater: Electric-immersion type, factory installed in coolant jacket system. Comply with NFPA 110 requirements for Level 1 equipment for heater capacity. Heater shall include a circulation pump. Provide isolation valves that allow for change out of the heater without having to drain the entire system.
- F. Governor: Shall provide isochronous control, with provisions to interface with load share modules and / or remote switchgear. The engine governor shall be an electronic Engine Control Module (ECM) with 24-volt DC Electric Actuator. The ECM shall be enclosed in an environmentally sealed, die-cast aluminum housing which isolates and protects electronic components from moisture and dirt contamination. The ECM shall adjust fuel delivery per exhaust smoke, altitude and cold mode limits. In the event of a DC power loss, the forward acting actuator will move to the minimum fuel position.
- G. Cooling System: Closed loop, liquid cooled, with radiator factory mounted on engine-generator-set mounting frame, radiator duct flange and integral engine-driven coolant pump.
1. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.
  2. Size of Radiator: Adequate to contain expansion of total system coolant from cold start to 100 percent load condition to an ambient temperature of 122F (50C) ambient. Radiator shall be capable of providing cooling for an external restriction of 1.0 inch of water column.
  3. Expansion Tank: Constructed of welded steel plate and rated to withstand maximum closed-loop coolant system pressure for engine used. Equip with gage glass and petcock.
  4. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.
  5. Coolant Hose: Flexible assembly with inside surface of nonporous rubber and outer covering of aging-, ultraviolet-, and abrasion-resistant fabric.
  6. Rating: 50-psig (345-kPa) maximum working pressure with coolant at 180°F (82°C), and non-collapsible under vacuum.
  7. End Fittings: Flanges or steel pipe nipples with clamps to suit piping and equipment connections.
  8. Integral fuel oil cooler shall be provided as required by the OEM.
- H. Muffler / Silencer:
1. Provide a minimum critical grade exhaust silencer with valved condensate drain that extends beyond the depth of the insulation, and of the appropriate size for use with the engine. The silencer shall have inlet and outlets configured as required to meet the project exhaust system design with a 12 inch water column maximum pressure drop. Flexible, full length stainless steel connector/wye shall be furnished as required between the silencer and the engine exhaust outlet(s). The generator set manufacturer shall furnish all appropriate fittings, flanges, etc., as required between the engine and the silencer.
- I. Air Intake Filter: Heavy duty dual element, engine mounted air cleaners with replaceable dry-filter elements, “blocked filter” visual indicator
- J. Starting System: 24 VDC electric with negative ground

1. Dual cranking motor: Dual electric starters that automatically engage and release from engine flywheel without binding.
2. Cranking cycle: as required by NFPA 110 for system level Type 1
3. Battery: Oversize (10%) capacity to accommodate starting within ambient temperature range specified in Part 1 "Project Conditions" Article to provide specified cranking cycle at least three times without recharging.
4. Battery Cable: Size as recommended by engine manufacturer for cable length required as per site conditions to be field verified by manufacturer's representative prior to order. Include required interconnecting conductors and connection accessories.
5. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation and 35-A minimum continuous rating.
6. 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 -40°C to +60°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 ±10%.
  - 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.

## **2.4 FUEL OIL STORAGE**

- A. 24hour sub base tank. See Sub Base fuel tank section for more information.

## **2.5 CONTROLS AND MONITORING**

- A. Provide a fully solid-state, microprocessor based, generator set controller. The control panel shall be designed and built by the engine manufacturer. The controller shall provide all operating, monitoring, and control functions for the generator set. The control panel shall provide real time digital communications to all engine and regulator controls via secure communication network.
- B. Environmental
  1. The generator set controller shall be tested and certified to the following environmental conditions:
    - a. -40°C to +70°C Operating Range
    - b. 100% condensing humidity, 30°C to 60°C
    - c. IP22 protection for rear of controller; IP55 when installed in control panel
    - d. 5% salt spray, 48 hours, +38°C, 36.8V system voltage
    - e. Sinusoidal vibration 4.3G's RMS, 24-1000Hz

f. Electromagnetic Capability (89/336/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC, BS EN 50081-2, 50082-2)

g. Shock: withstand 15G

C. Functional Requirements: The following functionality shall be integral to the control panel.

1. The control shall include a minimum 33 x 132 pixel, 24mm x 95mm, positive image, transfective LCD display with text based alarm/event descriptions.
2. The control shall include a minimum of 3-line data display
3. Audible horn for alarm and shutdown with horn silence switch
4. Standard ISO labeling
5. Multiple language capability
6. Remote start/stop control
7. Local run/off/auto control integral to system microprocessor
8. Cooldown timer
9. Speed adjust
10. Lamp test
11. Emergency stop push button
12. Voltage adjust
13. Voltage regulator V/Hz slope - adjustable
14. Password protected system programming

D. Digital Monitoring Capability: The controls shall provide the following digital readouts for the engine and generator. All readings shall be indicated in either metric or English units.

1. Engine
  - a. Engine oil pressure
  - b. Engine oil temperature
  - c. Engine coolant temperature
  - d. Engine RPM
  - e. Battery volts
  - f. Engine hours
  - g. Engine crank attempt counter
  - h. Engine successful start counter
  - i. Service maintenance interval
  - j. Real time clock
  - k. Engine exhaust stack temperature
  - l. Engine main bearing temperature

## 2. Generator

- a. Generator AC volts (Line to Line, Line to Neutral and Average.
- b. Generator AC current (Avg and Per Phase.
- c. Generator AC Frequency
- d. Generator kW (Total and Per Phase.
- e. Generator kVA (Total and Per Phase.
- f. Generator kVAR (Total and Per Phase.
- g. Power Factor (Avg and Per Phase.
- h. Total kW-hr
- i. Total kVAR-hr
- j. % kW
- k. % kVA
- l. % kVAR
- m. Generator bearing temperature
- n. Generator stator winding temperature
- o. Real (kW. Load Histogram – which tracks time that the generator kW is within predefined ranges

## 3. Voltage Regulation

- a. Excitation voltage
- b. Excitation current

E. Alarms and Shutdowns: The control shall monitor and provide alarm indication and subsequent shutdown for the following conditions. All alarms and shutdowns are accompanied by a time, date, and engine hour stamp that are stored by the control panel for first and last occurrence:

### 1. Engine Alarm/Shutdown

- a. Low oil pressure alarm/shutdown
- b. High coolant temperature alarm/shutdown
- c. Loss of coolant shutdown
- d. Overspeed shutdown
- e. Overcrank shutdown
- f. Emergency stop shutdown
- g. Low coolant temperature alarm
- h. Low battery voltage alarm
- i. High battery voltage alarm
- j. Control switch not in auto position alarm

- k. Battery charger failure alarm
- l. ATS remote start wiring failure

## 2. Generator Alarm/Shutdown

- a. Generator phase sequence
- b. Generator over voltage
- c. Generator under voltage
- d. Generator over frequency
- e. Generator under frequency
- f. Generator reverse power (real and reactive.
- g. Generator overcurrent (including inverse definite minimum time. for Normally Inverse, Very Inverse, Extremely Inverse conditions as well as those based on Thermal Damage Curve configurations
- h. Generator current balance

## 3. Voltage Regulator Alarm/Shutdown

- a. Loss of excitation alarm/shutdown
- b. Instantaneous over excitation alarm/shutdown
- c. Time over excitation alarm/shutdown
- d. Rotating diode failure
- e. Loss of sensing
- f. Loss of PMG

## F. Inputs and Outputs

1. Programmable Digital Inputs. The Controller shall include the ability to accept programmable digital input signals. The signals may be programmed for either high or low activation using programmable Normally Open or Normally Closed contacts.
2. Programmable Relay Outputs. The control shall include the ability to operate programmable relay output signals, integral to the controller. The output relays shall be rated for 2A @ 30VDC and consist of six (6) Form A (Normally Open) contacts and two (2) Form C (Normally Open & Normally Closed) contacts.
3. Programmable Discrete Outputs. The control shall include the ability to operate two (2) discrete outputs, integral to the controller, which are capable of sinking up to 300mA per input.
4. Integrated PLC Functionality. The panel shall allow the operator to create custom logic functions to provide additional user defined control of the generator set operation.

## G. Accessibility and Maintenance

1. All engine, voltage regulator, control panel and accessory units shall be accessible through a single electronic service tool. The following maintenance functionality shall be integral to the generator set control:
  - a. Engine running hours display
  - b. Service maintenance interval (running hours or calendar days)
  - c. Engine crank attempt counter

- d. Engine successful starts counter
- e. 40 events are stored in control panel memory
- f. Programmable cycle timer that starts and runs the generator for a predetermined time. The timer shall use 7 user-programmable sequences that are repeated in a 7-day cycle. Each sequence shall have the following programmable set points:
  - 1) Day of week
  - 2) Time of day to start
  - 3) Duration of cycle

#### H. Remote Communications

- 1. Remote Communications. The control shall include Modbus RTU communications as standard via RS-485 half duplex with configurable baud rates from 2.4k to 57.6k.

#### I. Local and Remote Annunciation

- 1. Local Annunciator (NFPA 99/110, CSA 282). Provide a local, control panel mounted, annunciator to meet the requirements of NFPA 110, Level 1.

- a. Annunciators shall be networked directly to the generator set control
- b. Local Annunciator shall include a lamp test pushbutton, alarm horn and alarm acknowledge pushbutton
- c. Provide the following individual light indications for protection and diagnostics:

- 1) Overcrank
- 2) Low coolant temperature
- 3) High coolant temperature warning
- 4) High coolant temperature shutdown
- 5) Low oil pressure warning
- 6) Low oil pressure shutdown
- 7) Overspeed
- 8) Low coolant level
- 9) EPS supplying load
- 10) Control switch not in auto
- 11) High battery voltage
- 12) Low battery voltage
- 13) Battery charger AC failure
- 14) Emergency stop
- 15) ATS Remote Start wiring failure
- 16) Spare

- 2. Remote Annunciator (NFPA 99/110, CSA 282). Provide a remote annunciator to meet the requirements of NFPA 110, Level 1.

- a. The annunciator shall provide remote annunciation of all points stated above and shall incorporate ring-back capability so that after silencing the initial alarm, any subsequent alarms will sound the horn. Ability to be located up to 4000 ft from the generator set without the use of a data repeater.

## **2.6 GENERATOR OVERCURRENT AND FAULT PROTECTION**

- A. Generator Protector: Microprocessor-based unit shall continuously monitor current level in each phase of generator output, integrate generator heating effect over time, and predict when thermal damage of alternator will occur. When signaled by generator protector or other generator-set protective devices, a shunt-trip device in the generator disconnect switch shall open the switch to disconnect the generator from load circuits. Protector shall perform the following functions:
  1. Initiates a generator overload alarm when generator has operated at an overload equivalent to 110 percent of full-rated load for 60 seconds. Indication for this alarm is integrated with other generator-set malfunction alarms.
  2. Under single or three-phase fault conditions, regulates generator to 300 percent of rated full-load current for up to 10 seconds.
  3. As overcurrent heating effect on the generator approaches the thermal damage point of the unit, protector switches the excitation system off, opens the generator disconnect device, and shuts down the generator set.
  4. Senses clearing of a fault by other overcurrent devices and controls recovery of rated voltage to avoid overshoot.
- B. Ground-Fault Protection: Comply with NFPA 70, signals for ground-fault. Integrate ground-fault alarm indication with other generator-set alarm indications.

## **2.7 GENERATOR, EXCITER, AND VOLTAGE REGULATOR**

- A. Comply with NEMA MG 1.
- B. Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.
- C. Electrical Insulation: Class H insulation. Windings shall be random wound type. Temperature rise shall not exceed 130C over 40°C ambient temperature with SKVA of 2,023 at 30% voltage dip.
- 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, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.
- F. Enclosure: Drip proof.
- G. Instrument Transformers: Mounted within generator enclosure.
- H. Voltage Regulator: Solid-state type, separate from exciter, providing performance as specified.
  1. Voltage adjustment on control and monitoring panel shall provide plus or minus 5 percent adjustment of output-voltage operating band.
- I. Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point.
- J. Windings: 2/3 pitch stator winding and fully linked amortisseur winding.
- K. Subtransient Reactance: 12.21% percent or less.

## **2.8 VIBRATION ISOLATION DEVICES**

- A. Restrained Spring Isolators: Freestanding, steel, open-spring isolators.
  1. Housing: Steel with resilient vertical-limit stops to prevent spring extension due to wind loads or if weight is removed; factory-drilled baseplate bonded to 1/4-inch- (6-mm-) thick, elastomeric isolator pad attached to

baseplate underside; and adjustable equipment mounting and leveling bolt that acts as blocking during installation.

2. Outside Spring Diameter: Not less than 80 percent of compressed height of the spring at rated load.
3. Minimum Additional Travel: 50 percent of required deflection at rated load.
4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

## **2.9 ENCLOSURE / SUB BASE TANK**

### **A. Walk-In Sound Attenuated Enclosure**

1. The complete diesel engine generator set, including generator control panel, ATS, engine starting batteries and fuel oil tank, shall be enclosed in a custom assembled, sound attenuated walk-in enclosure mounted on a fuel tank base.
  - a. A weather resistant, sound attenuated enclosure made of aluminum. The enclosure shall have a reduction of 15 dba @ 23 ft with the genset running under full load. It shall consist of a roof, side walls, and end walls. Fasteners shall be either zinc plated or stainless steel.

#### **1.1. Installer**

- 1.1.1. The installing contractor shall coordinate the delivery and site installation of the equipment.
- 1.1.2. Due to the physical size of the equipment, it may be necessary to ship the generator set, enclosure, sub base tank, and enclosure intake and discharge air plenums and hoods as separate items. The installing contractor shall coordinate with the manufacturer's technical representatives to assemble and install any separate items at the site.

## **2.0 Enclosure Design Criteria**

- 2.1. Product shall be designed as walk-in type, sound attenuated weatherproof protected, aluminum enclosure. It shall completely enclose the generator set and associated auxiliary equipment.
- 2.2. Enclosure shall be designed to adequately accommodate generator and applicable walk-in working space for operation and maintenance purposes in accordance with NEC, NFPA, and OSHA requirements.
  - 2.2.1. Minimum walk-around space of 24" shall be provided on each side of generator set frame rail.
  - 2.2.2. At the rear, a minimum 36" of NEC clearance shall be provided behind the generator control panel.
  - 2.2.3. One fire extinguisher to be provided inside of the enclosure.
- 2.3. Enclosure Construction
  - 2.3.1. Enclosure shall include individual components generally consisting of a roof, two side walls and two end walls of formed aluminum, enclosure mounted intake and discharge air acoustic hoods or plenums, and non-asbestos acoustical insulation and securement linings. All attaching hardware shall be stainless steel.
  - 2.3.2. Enclosure Roof
    - 2.3.2.1. Enclosure roof shall be constructed of 5052 marine grade, mill finish, interlocking-type formed aluminum panels of minimum 0.125" thickness.
    - 2.3.2.2. A weatherproof mastic / sealant shall be used along the roof perimeter and any roof skin joints.



- 2.3.2.3. The roof rail perimeter shall have two roof lifting rings internally installed on each side, providing a total of four points for lifting of the complete enclosure. Each ring shall have a lifting capacity of 10,000 lbs.
  - 2.3.2.4. All external roof hardware shall be stainless steel screw type mechanical fastener with neoprene watertight washers.
  - 2.3.2.5. Roof shall be designed and built to withstand load of 75 pounds per square foot.
  - 2.3.2.6. Roof shall incorporate an aluminum or stainless-steel rain collar and rain shield for the generator exhaust silencer piping. These shall be installed at the roof penetration point to prevent the entry of rainwater into the enclosure, as well as allow for expansion and vibration of the exhaust piping without stress to the exhaust system.
  - 2.3.2.7. Rain collars and shields shall be furnished for all sub-base tank vents that penetrate the enclosure roof.
  - 2.3.2.8. Roof interior shall contain non-asbestos thermal acoustic insulation with fire-retardant properties. The insulation shall be completely covered by mill finish 0.050" perforated aluminum lining secured to the enclosure interior.
  - 2.3.2.9. When the installed headroom above the radiator is less than 24", a Beckson deckplate for radiator fill access shall be installed, centered above each radiator fill port. Deckplate shall be sealed to roof panels to prevent water penetration.
- 2.3.3. Enclosure Walls
- 2.3.3.1. Enclosure walls shall be constructed of formed 3003 pre-finished interlocking type formed aluminum panels of minimum 0.080" thickness.
  - 2.3.3.2. All interior sidewalls shall contain non-asbestos thermal acoustic insulation with fire-retardant properties. The insulation shall be completely covered by mill finish 0.050" perforated aluminum lining secured to the enclosure interior.
  - 2.3.3.3. All attaching hardware shall be stainless steel screw type mechanical fastener.
- 2.3.4. Enclosure Air Treatment
- 2.3.4.1. Air Intake
    - 2.3.4.1.1. Air shall enter the engine room through motorized intake louvers with bird / rodent screen (includes relay panel)
    - 2.3.4.1.2. The intake shall be sized according to the generator's airflow requirements to encompass combustion air and radiator cooling air. Airflow shall not exceed the louver manufacturer's published water entry velocity.
  - 2.3.4.2. Air Discharge
    - 2.3.4.2.1. Hooded discharge air shall be expelled from the engine room through aluminum gravity-operated dampers with counterbalance weights.
    - 2.3.4.2.2. Discharge air shall be turned 90° and exit the enclosure through a discharge plenum sized according to the generator's airflow requirements for radiator cooling air. The top of the discharge plenum shall be equipped with punched aluminum panels. The panels shall have no more than a 20% reduction in free area at the opening in order to prevent entry of particles more than 1" in diameter. The discharge plenum shall allow proper airflow according to generator manufacturer's requirements.
    - 2.3.4.2.3. Discharge air shall be ducted to the engine room discharge wall with an adapter constructed of heavy neoprene.
    - 2.3.4.2.4. The air discharge plenum shall be furnished with a turning vane with a water collection basin extending through both side walls of the air discharge plenum.
    - 2.3.4.2.5. The combined air inlet and discharge system shall be designed to maintain a combined total static pressure restriction of no more than 0.5" of water gauge through the enclosure with the generator set operating at full rated load and duty.

### 2.3.5. Enclosure Doors

- 2.3.5.1. Five (5) single access doors shall be installed on the enclosure. Rear door Doors shall be used for access to ATS.
- 2.3.5.2. All doors shall be constructed of 0.080" thick 3003 mill finish aluminum with a continuous piano hinge of open width 1.5" and a ¼" diameter stainless steel hinge pin.
- 2.3.5.3. Doors shall be installed into 0.125" mill finish aluminum frames with compressible weather-stripping.
- 2.3.5.4. The doors shall be equipped with heavy-duty two-point hardware with panic release handle to permit escape from the inside when door is locked. Exterior pad-lockable hardware shall be stainless steel.
- 2.3.5.5. Each door shall be provided with stainless steel tie-back hardware to hold door fully open during maintenance activities.
- 2.3.5.6. Door handle strike plates shall be included on enclosure walls adjacent to the door to provide impact protection from the door handle.
- 2.3.5.7. Drip rails shall be mounted over each door.

### 2.3.6. Enclosure Fittings

- 2.3.6.1. Oil and water drains shall be extended to the exterior, plugged and labeled. A 12-gauge stainless steel fitting plate with ¾" stainless steel coupling shall be affixed at the enclosure wall pass-through.
- 2.3.6.2. Fumes exhaust disposal tube shall terminate into exterior radiator exhaust plenum wall. A 12-gauge stainless steel fitting plate with stainless steel pipe sized for engine requirement shall be affixed at the enclosure wall pass-through.

### 2.3.7. Enclosure Access

- 2.3.7.1. The manufacturer shall provide galvanized steel stairways and platforms for personnel access to each of the generator enclosure doors. These will be customized to meet existing site conditions.
- 2.3.7.2. The stairs and platforms shall include handrails in compliance with OSHA regulations.
- 2.3.7.3. The generator vendor shall coordinate with the installing contractor for stair/platform installation locations and provide details for all anchoring/mounting points.
- 2.3.7.4. The installing contractor shall be responsible for furnishing concrete foundations for the stair/platform assemblies, as well as installing and anchoring the assemblies on-site as coordinated with the site engineer and generator vendor.

## 2.4. Enclosure Sound-Attenuating Performance

- 2.4.1. The published combined engine and exhaust source sound level shall be reduced by 15 dBA at a seven meter distance in any direction from the enclosure, measured in a free field environment.

## 2.5. Engine Exhaust System

- 2.5.1. Exhaust system shall not exceed maximum back pressure levels required by engine manufacturer.
- 2.5.2. The exhaust silencer shall be located on the interior of the enclosure and shall be critical grade and internally insulated.
- 2.5.3. Exhaust silencer shall be connected to the engine using stainless steel flexible element/s with a minimum length 12" covered with thermal insulating blankets. Exhaust shall exit the silencer through a short radius carbon steel elbow, which shall penetrate the roof a minimum of 12" above the enclosure roof. The elbow shall be thermally insulated and shall terminate with a rain guard and corrosion-resistant exhaust rain cap.

## 2.6. Electrical

- 2.6.1. 15kVA, 600V: 120/240V Single-phase transformer, fused disconnect switch, 100A, 120/240V single phase load center. Qty (5) LED light fixtures (one light fixture located in ATS room with combination receptacle/light switch. Qty (3) light switches. Qty (3) 20A GFI duplex receptacles
- 2.6.2. Install ASCO 7000 Series 3,000A 600V ATS inside of enclosure in it's own room with air conditioning and heat pump.

### C. Sub Base Tank

Provide a double wall sub-base tank constructed to meet all local codes and requirements. A fuel tank base of 1,058 usable gallons (24-hour capacity) shall be provided as an integral part of the enclosure. It shall be contained in a rupture basin with 110% capacity. The tank shall meet UL142 standards. A locking fill cap, a mechanical reading fuel level gauge, low fuel level alarm contact, and fuel tank rupture alarm contact shall be provided.

#### 1.0 Responsibility

- 1.1. It shall be the responsibility of the manufacturer to assemble the fuel tank at the manufacturing plant
- 1.2. Installing contractor shall be responsible for proper installation and testing of tank, field piping, and loose items as listed in shop drawings. Installing contractor shall also coordinate wiring of interconnected devices.
- 1.3. The fire-regulating authority having jurisdiction shall review all tank installations.

#### 2.0 Codes Governing Tank Construction and Installation

- 2.1. UL Publications. Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.
  - 2.1.1. ANSI / UL 142: *Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids.*
- 2.2. NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.
  - 2.2.1. NFPA 30: *Flammable and Combustible Liquids Code.*
  - 2.2.2. NFPA 37: *Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines.*
  - 2.2.3. NFPA 110: *Standard for Emergency and Standby Power Systems.*
- 2.3. UFC: *Uniform Fire Code.* Western Fire Chiefs Association, 300 North Main Street # 25, Fallbrook, CA 92028

#### 3.0 Fuel Tank Labeling Requirements

- 3.1. The generator sub-base tank shall be listed and labeled as follows:
  - 3.1.1. "UL Special Purpose, Secondary Containment Generator Base Tank"
  - 3.1.2. "Manufactured by Phoenix Products, Jacksonville FL
- 3.2. The tank shall bear a UL label indicating the following:
  - 3.2.1. Type of product
  - 3.2.2. Volume capacity
  - 3.2.3. Top loading capacity
  - 3.2.4. Emergency venting capacity

- 3.2.5. Manufacturer and manufacturing date
- 3.3. The fuel fill port shall be labeled with "Fill," rated capacity, and product.
- 3.4. The tank shall be labeled "No Smoking" and "Combustible" on the corners such that the labels are visible from each side of the tank.
- 3.5. NFPA diamonds shall be supplied and affixed by the installing contractor in accordance with NFPA requirements.
- 3.6. Tank fittings shall be labeled using a UL-approved label material denoting the proposed use of each port.

#### 4.0 Design Criteria

##### 4.1. Material Thickness

###### 4.1.1. Primary Tank

- 4.1.1.1. Tanks with capacity under 5000 gallons shall be constructed of minimum  $\frac{3}{16}$ " ASTM A36.

###### 4.1.2. Secondary Tank

- 4.1.2.1. Tanks with capacity under 5000 gallons shall be constructed of minimum  $\frac{3}{16}$ " ASTM A36.

##### 4.2. Tank Fittings

- 4.2.1. All tank ports shall be carbon steel, inverted Type 125# weld flanges.

- 4.2.2. Fittings shall include, at a minimum:

- 4.2.2.1. Tank fill – 4" FNPT
- 4.2.2.2. Fill box drain
- 4.2.2.3. Fuel level gauge – 2" FNPT
- 4.2.2.4. Primary tank vent – sized per UL 142 requirements (minimum 2")
- 4.2.2.5. Primary emergency vent – sized per UL 142 requirements
- 4.2.2.6. Secondary emergency vent – sized per UL 142 requirements
- 4.2.2.7. Fuel oil supply to engine – 2" FNPT
- 4.2.2.8. Fuel oil return from engine – 2" FNPT
- 4.2.2.9. Low level port – 2" FNPT
- 4.2.2.10. High level port – 2" FNPT
- 4.2.2.11. Leak sensor port – 2" FNPT
- 4.2.2.12. Spare port – 2" FNPT
- 4.2.2.13. Spare port – 4" FNPT

##### 4.3. UL Testing Requirements

- 4.3.1. The primary and secondary fuel tanks shall be tested at 3-PSI air pressure as outlined in UL 142.
- 4.3.2. The tank shall be designed and tested to support a generator set weight of 60,900 lbs.
- 4.3.3. Lift lugs shall be UL approved.

##### 4.4. Tank Construction

###### 4.4.1. Tank Supports

- 4.4.1.1. The tank shall include seismic / hurricane mounting provisions as an integral, permanent tank component.
- 4.4.1.2. Mounting provisions shall allow minimum 2" airspace between concrete slab and secondary tank to facilitate inspection and maintenance of tank bottom.
- 4.4.1.3. Mounting supports shall include a neoprene barrier of minimum  $\frac{3}{8}$ " thickness to isolate fuel tank from concrete slab.

- 4.4.1.4. Each mounting support shall include integral grounding provisions on each end.
- 4.4.1.5. Each mounting support shall include 1" diameter mounting holes on each end.
- 4.4.2. Electrical Stub-Up
  - 4.4.2.1. The tank shall include an electrical stub-up opening, properly sized and located for the 3,000A SER ATS located in rear of enclosure.
  - 4.4.2.2. The electrical stub-up shall be rectangular, through-tank, and UL tested / approved.
- 4.4.3. Tank Finish
  - 4.4.3.1. Preparation: Outer tank shall be abrasive blasted.
  - 4.4.3.2. Primer Coat: Outer tank shall be primed with one coat of primer.
  - 4.4.3.3. Finish Coat: Outer tank shall be finish coated with black satin enamel.
- 4.5. Overfill Protection
  - 4.5.1. Spill Containment Box
    - 4.5.1.1. A spill containment box (UL-approved) shall be provided as an integral tank component, and shall carry the same FDEP approval number as the tank.
    - 4.5.1.2. Construction shall be carbon steel, with powder coat finish.
    - 4.5.1.3. The box shall have a drain valve, to release excess fuel back to primary tank.
    - 4.5.1.4. The box shall be pad-lockable.
  - 4.5.2. Overfill Prevention Equipment
    - 4.5.2.1. Tank shall be equipped with an overfill prevention valve set to positively shut off fuel flow at 95%. Kamlok tight-fill adapter with crossbar shall be factory installed in fuel fill fitting. Valve shall include a cast aluminum dust cap. Overfill prevention valve shall carry a valid FDEP approval number.
    - 4.5.2.2. A high level probe shall be installed at 90% of tank fill capacity. The probe shall carry a valid FDEP approval number.
    - 4.5.2.3. An alarm panel shall be installed at the fill location in clear view of the filler. It shall annunciate high level and tank leak alarms. The alarm panel shall carry a valid FDEP approval number.
    - 4.5.2.4. A mechanical fuel level gauge shall be provided. Gauge shall carry a valid FDEP approval number.
- 4.6. Leak Detection
  - 4.6.1. A leak sensor probe assembly shall be provided in order to detect liquid in the tank interstitial. The leak sensor shall carry a valid FDEP approval number.
  - 4.6.2. The leak sensor shall be wired to the alarm panel located at the fill location. The leak sensor output from the alarm panel shall then be wired to the generator control panel for annunciation.
- 4.7. Tank Venting
  - 4.7.1. The primary vent assembly shall be shipped loose, for installation by responsible contractor.
    - 4.7.1.1. Primary vent assembly shall consist of a pipe riser that will terminate 12' 0" above finished grade and include an updraft vent cap.
  - 4.7.2. An emergency vent shall be provided for the primary and secondary tanks, including a pressure-activated vent cap on each vent fitting.
- 4.8. Fuel Supply and Return
  - 4.8.1. Tank shall be provided with a removable suction assembly, properly sized according to engine requirements.
  - 4.8.2. Connection shall be made to the engine using a properly sized reinforced hose, rated for suction, from the tank to the engine supply and return. Push-on hose fittings shall not be acceptable.
- 4.9. Float Assembly

- 4.9.1. A low level float assembly shall be provided. Float shall be set at 25% of tank volume. Low level shall be wired to generator control panel for annunciation and engine shutdown.

## **2.9 AUTOMATIC SERVICE ENTRANCE RATED TRANSFER SWITCH**

### **Scope**

- A. Furnish and install one (1) 3,000A automatic transfer switch (ATS), 600V, Nema 1, 4 poles, inside of the generator enclosure. The closed transition, service entrance rated automatic transfer switch shall consist of an inherently double throw power transfer switch mechanism and a microprocessor controller to provide automatic operation. The transfer switch and controller shall be the products of the same manufacturer.

### **Codes and Standards**

The automatic transfer switches and controls shall conform to the requirements of:

- A. UL 1008 - Standard for Transfer Switch Equipment
- B. CSA certified to CSA 22.2 No. 178 – 1978 Automatic Transfer Switches
- C. IEC 60947-6-1 Low-voltage Switchgear and Controlgear; Multifunction equipment; Automatic Transfer Switching Equipment
- D. NFPA 70 - National Electrical Code
- E. NFPA 99 - Essential Electrical Systems for Health Care Facilities
- F. NFPA 110 - Emergency and Standby Power Systems
- G. IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
- H. NEMA Standard ICS10-1993 (formerly ICS2-447) - AC Automatic Transfer Switches
- I. International Standards Organization 9001:2008
- J. UL 508 Industrial Control Equipment

### **1.03 Acceptable Manufacturer**

Automatic transfer switches shall be ASCO 7000 Series. Alternate bids must list any deviations from this specification.

#### **Mechanically Held Transfer Switch**

- A. The transfer switch shall be electrically operated and mechanically held. The electrical operator shall be a momentarily energized, single-solenoid mechanism. Main operators which include overcurrent disconnect devices, linear motors or gears shall not be acceptable. The switch shall be mechanically interlocked to ensure only two possible positions, normal or emergency.
- B. All transfer switch sizes shall use only one type of main operator for ease of maintenance and commonality of parts.
- C. The switch shall be positively locked and unaffected by momentary outages, so that contact pressure is maintained at a constant value and contact temperature rise is minimized for maximum reliability and operating life.
- D. All main contacts shall be silver composition. Switches rated 800 amperes and above shall have segmented, blow-on construction for high withstand and close-on capability and be protected by separate arcing contacts.
- E. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. Switches rated 800 amps and higher shall have front removable and replaceable contacts. All stationary and moveable contacts shall be replaceable without removing power conductors and/or bus bars.
- F. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof, which are not intended for continuous duty, repetitive switching or transfer between two active power sources are not acceptable.
- G. Where neutral conductors must be switched as shown on the plans, the ATS shall be provided with fully rated overlapping neutral transfer contacts. The neutrals of the normal and emergency power sources shall be connected together only during the transfer and retransfer operation and remain connected together until power source contacts close on the source to which the transfer is being made. The overlapping neutral contacts shall not overlap for a period greater than 100 milliseconds. Neutral switching contacts which do not overlap are not acceptable.
- H. Where neutral conductors are to be solidly connected as shown on the plans, a neutral conductor plate with fully rated AL-CU pressure connectors shall be provided.

#### **Microprocessor Controller**

- A. The controller's sensing and logic shall be provided by a single built-in microprocessor for maximum reliability, minimum maintenance, and the ability to communicate serially through an optional serial communication module.
- B. A single controller shall provide twelve selectable nominal voltages for maximum application flexibility and minimal spare part requirements. Voltage sensing shall be true RMS type and shall be accurate to  $\pm 1\%$  of nominal voltage. Frequency sensing shall be accurate to  $\pm 0.2\%$ . The panel shall be capable of operating over a temperature range of -20 to +60 degrees C and storage from -55 to +85 degrees C.
- C. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance. Sensing

and control logic shall be provided on multi-layer printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers. The panel shall be enclosed with a protective cover and be mounted separately from the transfer switch unit for safety and ease of maintenance. The protective cover shall include a built-in pocket for storage of the operator's manuals.

- D. All customer connections shall be wired to a common terminal block to simplify field-wiring connections.
- E. The controller shall meet or exceed the requirements for Electromagnetic Compatibility (EMC) as follows:
  - 1. EN 55011:1991 Emission standard - Group 1, Class A
  - 2. EN 50082-2:1995 Generic immunity standard, from which:
    - EN 61000-4-2:1995 Electrostatic discharge (ESD) immunity
    - ENV 50140:1993 Radiated Electro-Magnetic field immunity
    - EN 61000-4-4:1995 Electrical fast transient (EFT) immunity
    - EN 61000-4-5:1995 Surge transient immunity
    - EN 61000-4-6:1996 Conducted Radio-Frequency field immunity
- A. The ATS shall be furnished in a Type 1 enclosure mounted inside the generator enclosure.
- B. All standard and optional door-mounted switches and pilot lights shall be 16-mm industrial grade type or equivalent for easy viewing & replacement. Door controls shall be provided on a separate removable plate, which can be supplied loose for open type units.

**Controller Display and Keypad**

- A. A four line, 20 character LCD display and keypad shall be an integral part of the controller for viewing all available data and setting desired operational parameters. Operational parameters shall also be available for viewing and limited control through the serial communications input port. The following parameters shall only be adjustable via DIP switches on the controller:
  - 1. Nominal line voltage and frequency
  - 2. Single or three phase sensing
  - 3. Operating parameter protection
  - 4. Transfer operating mode configuration  
(Closed transition)

All instructions and controller settings shall be easily accessible, readable and accomplished without the use of codes, calculations, or instruction manuals.

**Voltage, Frequency and Phase Rotation Sensing**

- A. Voltage and frequency on both the normal and emergency sources (as noted below) shall be continuously monitored, with the following pickup, dropout, and trip setting capabilities (values shown as % of nominal unless otherwise specified):

<u>Parameter</u>	<u>Sources</u>	<u>Dropout / Trip</u>	<u>Pickup / Reset</u>
Undervoltage	N&E,3φ	70 to 98%	85 to 100%
Overvoltage	N&E,3φ	102 to 115%	2% below trip
Underfrequency	N&E	85 to 98%	90 to 100%
Overfrequency	N&E	102 to 110%	2% below trip
Voltage unbalance	N&E	5 to 20%	1% below dropout

- B. Repetitive accuracy of all settings shall be within ± 0.5% over an operating temperature range of -20°C to 60°C.
- C. Voltage and frequency settings shall be field adjustable in 1% increments either locally with the display and keypad or remotely via serial communications port access.
- D. The controller shall be capable (when activated by the keypad or through the serial port) of sensing the phase rotation of both the normal and emergency sources. The source shall be considered unacceptable if the phase rotation is not the preferred rotation selected (ABC or CBA).
- E. Source status screens shall be provided for both normal & emergency to provide digital readout of voltage on all 3 phases, frequency, and phase rotation.
- F. The controller shall include a user selectable algorithm to prevent repeated transfer cycling to a source on an installation which experiences primary side, single phase failures on a Grounded Wye – Grounded Wye transformer which regenerates voltage when unloaded. The algorithm shall also inhibit retransfer to the normal (utility) source upon detection of a single phasing condition until a dedicated timer expires, the alternate source fails, or the normal source fails completely and is restored during this time delay period. The time delays associated with this feature shall be adjustable by the user through the controller keypad and LCD.

**Time Delays**

- A. An adjustable time delay of 0 to 6 seconds shall be provided to override momentary normal source outages and delay all transfer and engine starting signals. Capability shall be provided to extend this time delay to 60 minutes by providing an external 24 VDC power supply.
- B. A time delay shall be provided on transfer to emergency, adjustable from 0 to 60 minutes, for controlled timing of transfer of loads to emergency.

- C. Two time delay modes (which are independently adjustable) shall be provided on re-transfer to normal. One time delay shall be for actual normal power failures and the other for the test mode function. The time delays shall be adjustable from 0 to 60 minutes. Time delay shall be automatically bypassed if the emergency source fails and the normal source is acceptable.
- D. A time delay shall be provided on shut down of engine generator for cool down, adjustable from 0 to 60 minutes.
- E. A time delay activated output signal shall also be provided to drive an external relay(s) for selective load disconnect control. The controller shall have the ability to activate an adjustable 0 to 5 minute time delay in any of the following modes:
  1. Prior to transfer only.
  2. Prior to and after transfer.
  3. Normal to emergency only.
  4. Emergency to normal only.
  5. Normal to emergency and emergency to normal.
  6. All transfer conditions or only when both sources are available.
- F. The controller shall also include the following built-in time delays for optional Closed Transition and Delayed Transition operation:
  1. 1 to 5 minute time delay on failure to synchronize normal and emergency sources prior to closed transition transfer.
  2. 0.1 to 9.99 second time delay on an extended parallel condition of both power sources during closed transition operation.
  3. 0 to 5 minute time delay for the load disconnect position for delayed transition operation.
- G. All time delays shall be adjustable in 1 second increments, except the extended parallel time, which shall be adjustable in .01 second increments.
- H. All time delays shall be adjustable by using the LCD display and keypad or with a remote device connected to the serial communications port.

#### 3.04 Additional Features

- A. A three position momentary-type test switch shall be provided for the *test / automatic / reset* modes. The test position will simulate a normal source failure. The reset position shall bypass the time delays on either transfer to emergency or retransfer to normal.
- B. A SPDT contact, rated 5 amps at 30 VDC, shall be provided for a low-voltage engine start signal. The start signal shall prevent dry cranking of the engine by requiring the generator set to reach proper output, and run for the duration of the cool down setting, regardless of whether the normal source restores before the load is transferred.
- C. Auxiliary contacts, rated 10 amps, 250 VAC shall be provided consisting of one contact, closed when the ATS is connected to the normal source and one contact closed, when the ATS is connected to the emergency source.
- D. LED indicating lights (16 mm industrial grade, type 12) shall be provided; one to indicate when the ATS is connected to the normal source (green) and one to indicate when the ATS is connected to the emergency source (red).
- E. LED indicating lights (16 mm industrial grade, type 12) shall be provided and energized by controller outputs. The lights shall provide true source availability of the normal and emergency sources, as determined by the voltage sensing trip and reset settings for each source.

**The following features shall be built-in to the controller, but capable of being activated through keypad programming or the serial port only when required by the user:**

- F. Provide the ability to select “commit/no commit to transfer” to determine whether the load should be transferred to the emergency generator if the normal source restores before the generator is ready to accept the load.
- G. An Inphase monitor shall be provided in the controller. The monitor shall control transfer so that motor load inrush currents do not exceed normal starting currents, and shall not require external control of power sources. The inphase monitor shall be specifically designed for and be the product of the ATS manufacturer. The inphase monitor shall be equal to ASCO Feature 27.
- H. The controller shall be capable of accepting a normally open contact that will allow the transfer switch to function in a non-automatic mode using an external control device.
- I. **Engine Exerciser** - The controller shall provide an internal engine exerciser. The engine exerciser shall allow the user to program up to seven different exercise routines. For each routine, the user shall be able to:
  1. Enable or disable the routine.
  2. Enable or disable transfer of the load during routine.
  3. Set the start time, .
    - time of day
    - day of week
    - week of month (1st, 2nd, 3rd, 4th, alternate or every)
  4. Set the duration of the run.



At the end of the specified duration the switch shall transfer the load back to normal and run the generator for the specified cool down period. A 10-year life battery that supplies power to the real time clock in the event of a power loss will maintain all time and date information.

**The following feature shall be built - into the controller, but capable of being activated through keypad programming or the communications interface port.**

**Note: The transfer switch will operate in a non-automatic mode with this feature activated.**

- J.** Terminals shall be provided for a remote contact which opens to signal the ATS to transfer to emergency and for remote contacts which open to inhibit transfer to emergency and/or retransfer to normal. Both of these inhibit signals can be activated through the keypad or serial port.
- K. System Status** - The controller LCD display shall include a “System Status” screen which shall be readily accessible from any point in the menu by depressing the “ESC” key a maximum of two times. This screen shall display a clear description of the active operating sequence and switch position. For example,

*Normal Failed*  
*Load on Normal*  
*TD Normal to Emerg*  
*2min15s*

Controllers that require multiple screens to determine system status or display “coded” system status messages, which must be explained by references in the operator’s manual, are not permissible.

- L. Self Diagnostics** - The controller shall contain a diagnostic screen for the purpose of detecting system errors. This screen shall provide information on the status input signals to the controller which may be preventing load transfer commands from being completed..
- M. Data Logging** – The controller shall have the ability to log data and to maintain the last 99 events, even in the event of total power loss. The following events shall be time and date stamped and maintained in a non-volatile memory:
  - 1. Event Logging**
    - 1. Data and time and reason for transfer normal to emergency.
    - 2. Data and time and reason for transfer emergency to normal.
    - 3. Data and time and reason for engine start.
    - 4. Data and time engine stopped.
    - 5. Data and time emergency source available.
    - 6. Data and time emergency source not available.
  - 2. Statistical Data**
    - 1. Total number of transfers.
    - 2. Total number of transfers due to source failure.
    - 3. Total number of days controller is energized.
    - 4. Total number of hours both normal and emergency sources are available.

- N. Communications Module** – Shall provide remote interface module to support monitoring of vendor’s transfer switch, controller and optional power meter. Module shall provide status, analog parameters, event logs, equipment settings & configurations over embedded webpage and open protocol. Features shall include:

- 1.** Email notifications and SNMP traps of selectable events and alarms may be sent to a mobile device or PC.
- 2.** Modbus TCP/IP, SNMP, HTTP, SMTP open protocols shall be simultaneously supported.
- 3.** Web app interface requiring user credentials to monitor and control the transfer switch supporting modern smart phones, tablets and PC browsers. User will be able to view the dynamic one-line; ATS controls status, alarms, metering, event logging as well as settings.
- 4.** Secure access shall be provided by requiring credentials for a minimum of 3 user privilege levels to the web app, monitor (view only), control (view and control) and administrator (view, control and change settings). 128-Bit AES encryption standard shall be supported for all means of connectivity.
- 5.** Shall allow for the initiating of transfers, retransfers, bypassing of active timers and the activating/deactivating of engine start signal shall be available over the embedded webpage and to the transfer switch vendor’s monitoring equipment.
- 6.** An event log displaying a minimum of three hundred (300) events shall be viewable and printable from the embedded webpages and accessible from supported open protocols.
- 7.** Four (4) 100 Mbps Ethernet copper RJ-45 ports, five (2) serial ports, Termination dip-switches and LEDs for diagnostics.
- 8.** DIN rail mountable.

This option shall be equivalent to ASCO accessory 72EE2

**O. External DC Power Supply** – An optional provision shall be available to connect an external 24 VDC power supply to allow the LCD and the door mounted control indicators to remain functional when both power sources are dead. This option shall be equivalent to ASCO accessory 1G.

**P. Power Meter** – (This feature shall be equal to ASCO accessory 135L, or feature bundle accessory 150\*).

*The Power Meter shall conform to the requirements of:*

1. UL 3111-1-Electrical Measuring and Testing Equipment
2. CAN/CSA-C22.2 No. 23-M89-CSA Safety Requirements for Electrical and Electronic Measuring and Test Equipment
3. The Power Meter shall be capable of operating without modification at a nominal frequency of 45 to 66Hz.
4. The Power Meter shall be rated for an operating temperature of -4°F to 158°F and a storage temperature of -22°F to 176°F. and shall be rated for an 85% non-condensing, relative humidity.
5. The Power Meter shall accept inputs from industry standard instrument transformers (120 VAC secondary PT's and 5A secondary CT's). Direct phase voltage connections, 0 to 600VAC nominal, shall be possible without the use of PT's.
6. The Power Meter shall accept single, 3 phase, or three & four wire circuits. A fourth CT input shall be available to measure neutral or ground current.
7. The Power Meter shall contain a built-in discrete contact to wire an ATS 14A auxiliary contact to indicate switch position.
8. The Power Meter shall accept AC voltage from the sensing lines for operation. Additional provisions shall be provided for external DC voltage input range 9-36 VDC with a nominal of 24 VDC.
9. The Power Meter shall be equipped with a continuous duty, long –life, 4 line x 20 character green backlit LCD
10. All setup parameters required by the Power Meter shall be stored in non- volatile memory and retained in the event of a control power interruption.
11. The Power Meter shall be flush mountable on a surface.
12. The Power Meter enclosure shall be sealed to IP-51 (NEMA 1) and The faceplate shall be sealed to IP-65 (NEMA 4). All push buttons shall be sealed tact switches.
13. The Power Meter shall send, when prompted, information to a central location equipped with a manufacturer supplied critical power management system or 3<sup>rd</sup> party monitor through manufacturer supplied communication modules. All 3<sup>rd</sup> party monitor must utilize industry standard open protocols Modbus/RTU.Modbus/TCP or

SNMP.

14. An embedded RS-485 port will be provided which will enable communication at 9600, 19.2K, 38.4K, or 57.6K baud. DIP switches will be provided on the RS-485 port allowing a user to select 2-wire or 4-wire communication as well as the option to activate a terminating resistor on the port.
15. The Power Meter shall help facilities comply with NEC 220. It shall provide Maximum Demand calculations for the past 24 months, as per standards with 15 minute averages.
16. The following data will be available on the display and Modbus registers of the Power Meter:
  - Line-to-neutral voltages ( $V_{AN}$ ,  $V_{BN}$ , and  $V_{CN}$ )
  - Line-to-neutral voltage average ( $V_{AVE}$ )
  - Line-to-line voltages ( $V_{AB}$ ,  $V_{BC}$ , and  $V_{CA}$ )
  - Line-Line voltage average ( $V_{LAVE}$ )
  - Current on each phase ( $I_A$ ,  $I_B$ , and  $I_C$ )
  - Current on the neutral conductor ( $I_N$ )
  - Average current ( $I_{AVE}$ )
  - Active power, KW per phase and total ( $W_A$ ,  $W_B$ ,  $W_C$ , and  $W_T$ )
  - Apparent power, KVA per phase and total ( $V_{AA}$ ,  $V_{AB}$ ,  $V_{AC}$ , and  $V_{AT}$ )
  - KWHours importing, exporting and net ( $KWH_{IMP}$ ,  $KWH_{EXP}$ , and  $KWH_{NET}$ )
  - KVARHours leading, lagging and net ( $KVARH_{LEAD}$ ,  $KVARLAG$ , and  $KVARH_{NET}$ )
  - Power factor (PF)
  - Signal Frequency (Hz)
  - Digital Input
17. The Power Meter shall offer an LCD which can display no less than nine different languages.
18. Displaying each of the metered values shall be done through the use of menu scroll buttons. There will be an escape button which will be used to take the user back to the previous page or to cancel a setting change. Pressing escape no more than three times will return the user to the home screen.
19. For ease of operator viewing, the display can be configured to remain on continuously, with no detrimental effect on the life of the Power Meter.
20. The display's contrast shall be configurable in intervals of 10% (ranging 0%-100%).
21. Setup of a system requirements shall be allowed from the front of the Power Meter.

## ATS Remote Annunciator

### General

Provide and install ATS Remote Annunciators for monitoring and control of automatic transfer switches remotely over Ethernet.

### A. Hardware Specifications

The ATS Remote Annunciator shall be listed to cUL-60950-1 and UL 1008 and include the following features and ratings:

- *User-configured labels with ATS names and power sources*
- *Dual 10/100 Base-T auto sensing and auto crossover Ethernet ports*
- *LED indication of source acceptability, switch position, common alarm, time delay and Ethernet link activity*
- *Push button for transfer/retransfer control operations and time delay bypass*
- *Push buttons for Alarm Silence and Lamp Test*
- *Key lock to enable and disable the transfer push button*
- *Audible and visual alarm to indicate Communication Error ATS Locked Out Failure to Synchronize Extended Parallel and any of the 8 user-configured discrete inputs*
- *Programmable watchdog timer that can generate a system reset upon timeout (minimum 1 sec)*
- *Factory reset capability*
- *100 ms power ride-through*

### B. Software Specification

The ATS Remote Annunciator shall contain embedded web pages accessible via various web browsers with the following capabilities:

- *Configuration for protocol and communications management with the ability of auto discovering transfer switches on network*
- *Ability to create and print customized labels for ATS names and power sources*
- *The ability to choose a continuous or periodic audible alarm with customizable interval time*
- *View detailed packet status counters i.e. transmitted received and dropped packets with the ability to reset counters*
- *ATS source name configuration page which allows users to configure power source names and print labels*
- *Upgrade firmware from Ethernet network without interrupting equipment operation*

### C. Communications

Dual 10/100 Base-T (RJ-45) Ethernet ports are provided to support TCP/IP communications for up to eight automatic transfer switches via individual remote connectivity modules or daisy-chained serial modules into a single Connectivity Module. Additional features include:

- *Supports Full Duplex Flow Control (IEEE 802.3x)*
- *3.3V power supply with 5V I/O tolerance*
- *Supports 3 LEDs to indicate traffic link speed and collision*

### D. Mounting

The ATS Remote Annunciator is suitable for:

- *Surface mounting using mounting screws studs*
- *Flush Mount from behind a cutout section (Enclosure Door Mounting)*
- *Flush Mount from the front of a cutout section (Enclosure Door Mounting)*

### E. Power Supply

The ATS Remote Annunciator shall be capable of accepting 24VDC, 120 VAC or 240 VAC power source.

### F. Environmental

The ATS Remote Annunciator shall have an Ambient Operating Temperature range of -4 ° to 158 ° F (-20 ° to +70 ° C) @ 5~85% humidity and Ambient Storage Temperature of -40 ° to 185 ° F (-40 ° to 85 ° C).

## PART 5 ADDITIONAL REQUIREMENTS

### Withstand and Closing Ratings

- A. The ATS shall be rated to close on and withstand the available RMS symmetrical short circuit current at the ATS terminals with the type of overcurrent protection shown on the plans.
- B. The ATS shall be UL listed in accordance with UL 1008 and be labeled in accordance with .025 or .050 seconds, time based ratings, or appropriate short time rating(s) as applicable. ATSs which are not tested and labeled with .025 or .050 time based ratings, or appropriate short time rating(s) and have series, or specific breaker ratings only, are not acceptable.

### Tests and Certification

- A. The complete ATS shall be factory tested to ensure proper operation of the individual components and correct overall sequence of operation and to ensure that the operating transfer time, voltage, frequency and time delay settings are in compliance with the specification requirements.
- B. The ATS manufacturer shall be certified to ISO 9001:2008 International Quality Standard and the manufacturer shall have third party certification verifying quality assurance in design/development, production, installation and servicing in accordance with ISO 9001:2008

**Service Representation**

- A. The ATS manufacturer shall maintain a national service organization of company-employed personnel located throughout the contiguous United States. The service center's personnel must be factory trained and must be on call 24 hours a day, 365 days a year.
- B. The manufacturer shall maintain records of each switch, by serial number, for a minimum of 20 years.

**2.10 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 and with IEEE 115.

**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 INSTALLATION**

- A. Comply with packaged engine-generator manufacturers' written installation and alignment instructions, NFPA 110 and all local codes
- B. Install packaged engine generator to provide access, without removing connections or accessories, for periodic maintenance.
- C. Install packaged engine generator with restrained spring isolators having a minimum deflection of 1 inch.
- D. Install Schedule 40, black steel piping with welded joints and connect to engine muffler. Install thimble at wall. Piping shall be same diameter as muffler outlet. Flexible connectors and steel piping materials and installation requirements are specified in Division 23
  - 1. Install condensate drain piping to muffler drain outlet full size of drain connection with a shutoff valve, stainless-steel flexible connector, and Schedule 40, black steel pipe with welded joints. Flexible connectors and piping materials and installation requirements are specified in Division 23 Section "Hydronic Piping."
- E. Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted. Electrical wiring includes but is not limited to battery chargers, heaters, control power, load bank, grounding, remote annunciator panels, paralleling gear, remote control panels, etc. Contractor to include as part of their scope of work, wall wiring and empty conduit indicated on contract drawings, specified herein, indicated/noted on approved manufacturers shop drawings and as required to provide a fully functional system.

**3.3 CONNECTIONS**

- A. Piping installation requirements are specified in Division 23 Sections. Drawings indicate general arrangement of piping and specialties.
- B. Connect fuel, cooling-system, and exhaust-system piping adjacent to packaged engine generator to allow service and maintenance.

- C. Connect cooling-system water piping to engine-generator set and with single braid corrosion resistant type 302 stainless steel wire braid and compression fittings.
- D. Connect engine exhaust pipe to engine with stainless steel flexible connector.
- E. Connect fuel piping to engines with a gate valve and union and stainless steel flexible connector. Provide all required fire safe-off and solenoid valves.
- F. Connect to BMS, coordinate with controls contractor.
- G. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- H. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

### **3.4 IDENTIFICATION**

- A. Identify system components according to Division 23 Section "Identification for HVAC Piping and Equipment" and Division 26 Section "Identification for Electrical Systems."

### **3.5 FIELD QUALITY CONTROL**

- A. Field Testing: If factory service technicians cannot provide the field testing specified as part of manufacturer's start-up, this contractor shall engage a qualified factory certified and authorized testing agency to perform tests and inspections and prepare test reports required by manufacturer.
- B. Manufacturer's Field Service: Contractor to include field services of factory-authorized service representatives to provide start-up testing as well as to assist in 3rd party system commissioning as specified under the system commissioning specifications. Testing will not be concurrent so multiple travel days shall be included as per the approved schedule.
- C. Perform tests and inspections and prepare test reports.
- D. Tests and Inspections:
  1. Perform tests recommended by manufacturer and each electrical test and visual and mechanical inspection for "AC Generators and for Emergency Systems" specified in NETA Acceptance Testing Specification. Certify compliance with test parameters. Generators shall be tested individually and in parallel.
  2. NFPA 110 Acceptance Tests: Perform tests required by NFPA 110 that are additional to those specified here including, but not limited to, single-step full-load pickup test.
  3. Battery Tests: Equalize charging of battery cells according to manufacturer's written instructions.
    - 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.
    - c. Verify acceptance of charge for each element of the battery after discharge.
    - d. Verify that measurements are within manufacturer's specifications.
  4. Battery-Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.
  5. 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.
  6. Exhaust Emissions Test: Comply with applicable government test criteria to confirm adherence to EPA Tier rating.
  7. Voltage and Frequency Transient Stability Tests: Use recording oscilloscope to measure voltage and frequency transients for 50 and 100 percent step-load increases and decreases, and verify that performance is as specified.

- 8. Harmonic-Content Tests: Measure harmonic content of output voltage under 25 percent and at 100 percent of rated linear load. Verify that harmonic content is within specified limits.
- 9. "Pull the Plug Test": Automatic start-up by means of simulated power outage to test remote-automatic starting, transfer of the load, and automatic shutdown. Prior to this test, all transfer switch timers shall be adjusted for proper system coordination. Engine coolant temperature, oil pressure, and battery charge level along with generator set voltage, amperes, and frequency shall be monitored throughout the test.
- E. Coordinate tests with tests for transfer switches and run them concurrently.
- F. Test instruments shall have been calibrated within the last 12 months, traceable to standards of NIST, and adequate for making positive observation of test results. Make calibration records available for examination on request.
- G. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
- H. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
- I. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- J. Remove and replace malfunctioning units and retest as specified above.
- K. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.
- L. 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.

### **3.6 DEMONSTRATION**

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged engine generators, load bank and associated paralleling gear operations. Refer to Division 01 Section "Demonstration and Training."

The power system has been designed to the specified manufacturer's electrical and physical characteristics. The equipment sizing, spacing, amounts, electrical wiring, ventilation equipment, fuel, and exhaust components have all been sized and designed around CATERPILLAR supplied equipment. Should any substitutions be made, the CONTRACTOR shall bear responsibility for the installation, coordination and operation of the system as well as any engineering and redesign costs, which may result from such substitutions.

### **3.7 DECOMMISSION OF EXISTING GENERATOR/ENCLOSURE/TANK**

- A. Prepare existing generator for removal and transportation.
- B. City of Concord will be responsible for removal of all fuel from existing sub base tank.
- C. City of Concord will disconnect utility feed to existing ATS and disconnect feed to generator enclosure load center.
- D. The Contractor will provide crane to lift existing enclosure package onto vendor-provided truck for removal.





**STANDARD FORM OF PERFORMANCE BOND: (Continued)**

THIS PERFORMANCE BOND is made and given pursuant to the requirements and provisions of Section 129 of Chapter 143 of the General Statutes of North Carolina and pursuant to Article 3 of Chapter 44-A of the General Statutes of North Carolina, and each and every provision set forth and contained in Section 129 of Chapter 143 and in Article 3 of Chapter 44-A of the General Statutes of North Carolina is incorporated herein, made a part hereof, and deemed to be conclusively written into this Bond.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals as of the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned and representative, pursuant to authority of its governing body.

WITNESS:

\_\_\_\_\_  
(Proprietorship or Partnership)  
Printed Name \_\_\_\_\_

\_\_\_\_\_  
Principal (Name of individual and trade name, partnership,  
corporation, or joint venture)

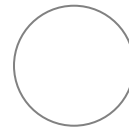
BY \_\_\_\_\_ (SEAL)  
Printed Name \_\_\_\_\_

TITLE \_\_\_\_\_  
(Owner, Partner, Office held in  
corporation, joint venture)

ATTEST: (Corporation)

**(Corporate Seal of Principal)**

BY \_\_\_\_\_  
Printed Name \_\_\_\_\_



TITLE \_\_\_\_\_  
(Corporation Secretary or  
Assistant Secretary Only)

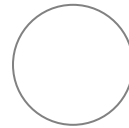
\_\_\_\_\_  
Surety (Name of Surety Company)

WITNESS:

BY \_\_\_\_\_  
Printed Name \_\_\_\_\_

TITLE \_\_\_\_\_ Attorney in Fact

**(Corporate Seal of Surety)**



COUNTERSIGNED:

\_\_\_\_\_  
(Address of Attorney in Fact)

\_\_\_\_\_  
N.C. Licensed Resident Agent

**NOTICE OF AWARD**

TO: \_\_\_\_\_

FROM: City of Concord City Council (OWNER)  
P.O. Box 308  
35 Cabarrus Ave. W  
Concord, North Carolina 28026-0308

PROJECT: **Hillgrove Water Treatment Plant  
Emergency Generator Set  
Bid# 2376**

You are hereby notified that the bid submitted by you for the above named project in response to the City of Concord's Invitation to Bid dated \_\_\_\_\_ in the amount of \_\_\_\_\_

You are hereby required to execute the formal AGREEMENT with the City of Concord City Council and to furnish any and all Contractor's Bond(s), Certificate of Insurance and Power of Attorney(s) along with other documents pertaining to the work as designated by the City of Concord.

If you fail to execute said AGREEMENT and to furnish this and any other required documents pertaining to the work within ten (10) days from the date of delivery of this NOTICE OF AWARD, said Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your bid as abandoned and to award the work covered by your proposal to another, or to re-bid the work or otherwise dispose thereof as the Owner may see fit.

**Dated this \_\_\_\_ day of \_\_\_\_\_, 20\_\_.**

City of Concord, North Carolina

CONTRACTOR

By: \_\_\_\_\_

By: \_\_\_\_\_

Title: Deputy City Engineer

Title: \_\_\_\_\_

ACCEPTANCE OF NOTICE OF AWARD

Receipt of the above NOTICE OF AWARD is hereby acknowledged this the \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

**NOTICE TO PROCEED**

TO:

FROM: City of Concord City Council (OWNER)  
P.O. Box 308  
35 Cabarrus Ave. W  
Concord, North Carolina 28026-0308

PROJECT: **Hillgrove Water Treatment Plant  
Emergency Generator Set**

Contract Amount: \_\_\_\_\_ and \_\_\_\_/100 DOLLARS  
(\$ \_\_\_\_\_).

You are hereby notified to commence work on or before the \_\_\_\_\_ day of \_\_\_\_, 20\_\_, pending acceptance of your Certificate of Insurance and any other required documents, and are to fully complete the work by the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

Your project final completion date is therefore the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, and as set forth in the above named project's schedule unless an extension is granted by the City of Concord Director of Engineering in writing.

City of Concord, North Carolina

By: \_\_\_\_\_

Title: City Manager

**Dated this the \_\_\_\_ day of \_\_\_\_\_, 20\_\_.**

## STANDARD FORM CONSTRUCTION CONTRACT

This contract (together with all exhibits and valid amendments, the "Agreement" or the "Contract") is made and entered into as of the \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by the City of CONCORD ("City") and \_\_\_\_\_ ("Contractor"), ( ) a corporation, ( ) a professional corporation, ( ) a professional association, ( ) a limited partnership, ( ) a sole proprietorship, or ( ) a general partnership; organized and existing under the laws of the State of \_\_\_\_\_.

**Sec. 1. Background and Purpose.** The Pitts School Rd. 24" Waterline project consists of the installation of 1,460 linear feet of 24-in waterline extension.

**Sec. 2. Services and Scope to be Performed.** The Contractor shall provide the services at the charges set forth either in this paragraph or in Exhibit "A". Additional exhibits may be used to further define this Agreement when the Contractor and City so agree. Any additional exhibits shall be designated as exhibits to the Agreement with capitalized, sequential letters of the alphabet, shall be attached hereto and incorporated herein by reference as if the same were fully recited, and shall become terms of this Agreement upon execution by both parties.

In this Contract, "services" means the services that the Contractor is required to perform pursuant to this Contract and all of the Contractor's duties to the City that arise out of this Contract. Any amendments, corrections, or change orders by either party must be made in writing signed in the same manner as the original. (This form may be used for amendments and change orders.) The City reserves the right to refuse payment for any work outside that authorized herein or pursuant to a duly approved amendment or change order.

**Sec. 3. Complete Work without Extra Cost.** Unless otherwise provided, the Contractor shall obtain and provide, without additional cost to the City, all labor, materials, equipment, transportation, facilities, services, permits, and licenses necessary to perform the Work.

**Sec. 4. Compensation.** The City shall pay the Contractor for the Work as described in this paragraph below OR as described in Exhibit "A" attached. In the event of a conflict, the provisions of this paragraph shall control. Any additional expenses or charges shall only be paid after both the City and the Contractor agree to and execute a written change order. The City shall not be obligated to pay the Contractor any fees, payments, expenses or compensation other than those authorized in this Contract or in a duly-approved change order. All payments shall be deemed inclusive of tax and other obligations.

**Sec. 4a. Retainage.** The City shall withhold no retainage on Contracts having a "total project cost" of less than \$100,000.00. The City may withhold retainage on contracts having a total project cost between \$100,000 and \$200,000. The City shall withhold retainage on contracts whose total project cost exceeds \$300,000. When withheld, retainage shall equal no more than five percent of each progress payment. When the project is fifty per cent complete, the City shall not retain anything from future project payments provided that (i) the surety concurs in writing, (ii) the Contractor continues to perform satisfactorily, (iii) any non-conforming work identified in writing by the architect, engineer(s) or City has been corrected by the Contractor and accepted by the architect, engineer(s) or City. However, if the City determines that the Contractor's performance is unsatisfactory, the City may withhold up to five percent retainage from each project payment. The City may withhold additional amounts above five percent for unsatisfactory job progress, defective construction not remedied, disputed work, third party claims filed against the owner or reasonable evidence that a third-party claim will be filed.

Definitions:

"Total Project Cost": Total value of the Contract and any approved change orders or amendments.

"Project is Fifty Percent Complete": When the Contractor's validly-issued gross project invoices (excluding the value of the materials stored off-site) equal or exceed fifty percent of the value of the Contract, except that the value of materials stored on-site shall not exceed twenty percent of the Contractor's gross project invoices for the purpose of determining whether the project is fifty percent complete.

**Sec. 5. Term.** The Contractor shall commence work within **ten (10)** days of the date of its receipt of written Notice to Proceed from the City. The date that is **ten (10)** days from the date of the Contractor's receipt of the Notice to Proceed shall be the "Commencement Date." All work as set forth in the Scope of Services in Exhibit "B" shall be

completed within **sixty (60)** calendar days of the Commencement Date. The date that is **sixty (60)** calendar days from the Commencement Date shall be the "Completion Date." Time is of the essence with regard to this Project. If Contractor's obligations are not completed by the Completion Date, the City reserves the right to nullify this Agreement, order the Contractor to immediately cease all work under this Agreement and vacate the premises, and to seek professional services equivalent to those outlined in Exhibit "B". The Contractor shall be held accountable for all damages incurred by the City as a consequence of the missed Completion Date. The exercise of any of these rights by the City shall not be interpreted to prejudice any other rights the City may have under this Agreement or in law or equity. This Contract shall not be automatically extended unless agreed to in writing by the City or as provided in Exhibit "B".

**Sec. 6. Contractor's Billings to City.** Payments will be made in accordance with the schedule found in this section below OR attached at Exhibit "A". Contractor shall submit an original pay request (invoice) to the City Purchasing Agent by the first of each month in order to expedite payment. Upon receipt of the request the City Purchasing Agent shall verify the amounts and if correct forward the request to the Accounts Receivable Division of the Finance Dept. Final payment on the Contract shall be made in 45 days, except in the case of retainage. Within 60 days after the submission of the final pay request, the City (with the written consent of the surety) shall release to the Contractor all retainage payments IF the City receives a certificate of substantial completion from the architect, engineer or designer-in-charge of the project OR the City receives beneficial occupancy and use of the project. In either case, the City may retain up to 2.5 times the estimated value of the work to be completed or corrected.

**Sec. 7. Insurance.** Contractor shall maintain and cause all sub-contractors to maintain insurance policies at all times with minimum limits as follows:

<u>Coverage</u>	<u>Minimum Limits</u>
Workers' Compensation	\$100,000 each accident, \$100,000 bodily injury by disease each employee, \$500,000 bodily injury by disease policy limit
General Liability	\$1,000,000 per occurrence regardless of the contract size
Automobile Liability	\$1,000,000 per occurrence regardless of the contract size
Umbrella	<input checked="" type="checkbox"/> \$1,000,000 per occurrence if contract does not exceed 180 days and does not exceed \$500,000; otherwise,
	<input type="checkbox"/> \$2,000,000 per occurrence

Contractor shall provide a Certificate of Insurance to the City listing the City as an additional insured. Such Certificate shall be in a form acceptable to the City.

**Sec. 8. Documentation Requirements:**

A. Contractor shall provide the City with a **Certificate of Insurance** for review prior to the issuance of any contract or Purchase Order. All Certificates of Insurance will require written notice by the insurer or Contractor's agent in the event of cancellation, reduction or other modifications of coverage by the insurer. Such notice shall be not less than 30 days for nonrenewal by the insurer, not less than 10 days for cancellation due to nonpayment of the premium and as soon as possible for all other types of modifications. In addition to the notice requirement above, Contractor shall provide the City with written notice of cancellation, reduction, or other modification of coverage of insurance whether instigated by the insurer or by the Contractor immediately upon Contractor's receipt of knowledge of such modifications. Upon failure of the Contractor to provide such notice, Contractor assumes sole responsibility for all losses incurred by the City for which insurance would have provided coverage. The insurance certificate shall be for the insured period in which the initial contract period begins and shall be renewed by the Contractor for each subsequent renewal period of the insurance for so long as the contract remains in effect.

The City shall be named as an **additional insured** on all policies except Workers' Compensation and it is required that coverage be placed with "A" rated insurance companies acceptable to the City. Statement should read, "City of Concord is added as an additional insured as evidenced by an endorsement attached to this certificate." Failure to maintain the required insurance in force may be cause for termination of this Agreement. In the event that the Contractor fails to maintain and keep in force the insurance herein required, the City has the right to cancel and terminate the Agreement without notice.

B. Contractor shall provide a completed W-9 form to the City prior to execution by the City of this Agreement.

**Sec. 9. Performance of Work by Contractor.**

(a) The Contractor warrants that all work performed under this Contract conforms to the Contract requirements and is free of any defect in equipment, material, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier. This warranty shall continue for a period of 1 year from the date of issuance by the City of written final completion of the work.

(b) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to City - owned or controlled real or personal property, when that damage is the result of--

- (1) The Contractor's failure to conform to contract requirements; or
- (2) Any defect of equipment, material, workmanship, or design furnished.

(c) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or replacement.

(d) The City shall notify the Contractor, in writing, within a reasonable time, not to exceed 30 days, after the discovery of any failure, defect, or damage.

(e) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time, not to exceed 30 days unless otherwise agreed in writing and signed by the City Manager or his designee, after receipt of notice, the City shall have the right to replace repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

(f) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this Contract, the Contractor shall--

- (1) Obtain all warranties that would be given in normal commercial practice,
- (2) Require all warranties to be executed, in writing, for the benefit of the City, if directed to do so by the City; and
- (3) Enforce all warranties for the benefit of the City, if directed to do so by the City

(g) In the event the Contractor's warranty has expired, the City may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

(h) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the City nor for the repair of any damage that results from any defect in City-furnished material or design.

**Sec. 10. Performance of Work by City.** If the Contractor fails to perform the Work in accordance with the schedule referred to in Exhibit "A", the City may, in its discretion, perform or cause to be performed some or all of the Work, and doing so shall not waive any of the City's rights and remedies. Before doing so, the City shall give the Contractor reasonable notice of its intention. The Contractor shall reimburse the City for all costs incurred by the City in exercising its right to perform or cause to be performed some or all of the Work pursuant to this section.

**Sec. 11. Attachments.** Additional exhibits may be used to further define this Agreement when the Contractor and City so agree. Any additional exhibits shall be designated as exhibits to the Agreement with capitalized, sequential

letters of the alphabet, shall be attached hereto and incorporated herein by reference as if the same were fully recited, and shall become terms of this Agreement upon execution by both parties.

*The following attachments* are made a part of this Contract and incorporated herein by reference:

- (a) **Exhibit “A” – Bid Form**
- (b) **Exhibit “B” – Specifications**
- (c) **Exhibit “C” – Standard Form of Performance Bond**
- (d) **Exhibit “D” – Contractor must execute the Affidavit attached as Exhibit “D”, attesting to compliance with state and federal laws related to E-Verify. \*This requirement only applies to contracts that fall within the formal bidding range.**
- (e) **Exhibit “E” – Tax Form(s).**
- (f) **Exhibit “F” – Certificate of Insurance.**

In case of conflict between an attachment and the text of this contract excluding the attachment, the text of this contract shall control. Any attachment that materially alters the standard terms contained herein must be reviewed by the City Attorney and approved by the City in writing.

**Sec. 12. Notice.** (a) All notices and other communications required or permitted by this Contract shall be in writing and shall be given either by personal delivery, fax, or certified United States mail, return receipt requested, addressed as follows:

To the City:

Sue Hyde, Director of Engineering  
City of Concord  
P.O. Box 308  
Concord, NC 28026  
Fax Number: (704) 786-4521

To the Contractor:

VaLerie Kolczynski, Esq.  
City Attorney  
PO Box 308  
Concord, NC 28026  
Fax Number: (704) 784-1791

(b) **Change of Address, Date Notice Deemed Given:** A change of address, fax number, or person to receive notice may be made by either party by notice given to the other party. Any notice or other communication under this Contract shall be deemed given at the time of actual delivery, if it is personally delivered or sent by fax. If the notice or other communication is sent by US Mail, it shall be deemed given upon the third calendar day following the day on which such notice or other communication is deposited with the US Postal Service or upon actual delivery, whichever first occurs.

**Sec. 13. Indemnification.** To the maximum extent allowed by law, the Contractor shall defend, indemnify, and save harmless the City of Concord, its agents, officers, and employees, from and against all charges that arise in any manner from, in connection with, or out of this Contract as a result of the acts or omissions of the Contractor or subcontractors or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable except for damage or injury caused solely by the negligence of the City its agents, officers, or employees. In performing its duties under this section, the Contractor shall at its sole expense defend the City of Concord, its agents, officers, and employees with legal counsel reasonably acceptable to City. As used in this subsection – “Charges” means claims, judgments, costs, damages, losses, demands, liabilities, duties, obligations, fines, penalties, royalties, settlements, expenses, interest, reasonable attorney’s fees, and amounts for alleged violations of sedimentation pollution, erosion control, pollution, or other environmental laws, regulations, ordinances, rules, or orders. Nothing in this section shall affect any warranties in favor of the City that are otherwise provided in or arise out of this Contract. This section is in addition to and shall be construed separately from any other indemnification provisions that may be in this Contract. This section shall remain in force despite termination of this Contract (whether by expiration of the term or otherwise) and termination of the services of the Contract under this Contract.

**Sec. 14. Corporate Status.** If the Contractor is dissolved or suspended and the Contractor does not notify the City of such dissolution within three (3) business days from date of dissolution or suspension, and/or the corporate status is not reinstated within thirty (30) days, this Contract, at the sole option of the City and without prejudice to City’s other remedies, shall be declared null and void or the Contractor shall execute a new contract showing the Contractor’s correct legal entity.

**Sec. 15. Miscellaneous.**

(a) Choice of Law and Forum. This Contract shall be deemed made in Cabarrus County, North Carolina. This Contract shall be governed by and construed in accordance with the laws of North Carolina. The exclusive forum and venue for all actions arising out of this Contract shall be the appropriate division of the North Carolina General Court of Justice, in Cabarrus County. Such actions shall neither be commenced in nor removed to federal court. This section shall not apply to subsequent actions to enforce a judgment entered in actions heard pursuant to this section.

(b) Waiver. No action or failure to act by the City shall constitute a waiver of any of its rights or remedies that arise out this Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

(c) Performance of Government Functions. Nothing contained in this Contract shall be deemed or construed so as to in any way estop, limit, or impair the City from exercising or performing any regulatory, policing, legislative, governmental, or other powers or functions.

(d) Severability. If any provision of this Contract shall be unenforceable, the remainder of this Contract shall be enforceable to the extent permitted by law.

(e) Assignment, Successors and Assigns. Without the City's written consent, the Contractor shall not assign (which includes to delegate) any of its rights (including the right to payment) or duties that arise out this Contract. Unless the City otherwise agrees in writing, the Contractor and all assigns shall be subject to all of the City's defenses and shall be liable for all of the Contractor's duties that arise out of this Contract and all of the City's claims that arise out of this Contract. Without granting the Contractor the right to assign, it is agreed that the duties of the Contractor that arise out of this Contract shall be binding upon it and its heirs, personal representatives, successors, and assigns.

(f) Compliance with Law. In performing all of the Work, the Contractor shall comply with all applicable law. Without limitation, Contractor shall comply with the requirements of Article 2, Chapter 64 (Verification of Work Authorization) of the North Carolina General Statutes relating to E-Verify. Further, if Contractor utilizes a subcontractor, Contractor shall require the subcontractor to comply with the requirements of Article 2 of Chapter 64 of the General Statutes.

(g) City Policy. THE CITY OPPOSES DISCRIMINATION ON THE BASIS OF RACE AND SEX AND URGES ALL OF ITS CONTRACTORS TO PROVIDE A FAIR OPPORTUNITY FOR MINORITIES AND WOMEN TO PARTICIPATE IN THEIR WORK FORCE AND AS SUBCONTRACTORS AND VENDORS UNDER CITY CONTRACTS.

(h) EEO Provisions. During the performance of this Contract the Contractor agrees as follows: (1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, political affiliation or belief, age, or handicap. The Contractor shall take affirmative action to insure that applicants are employed and that employees are treated equally during employment, without regard to race, color, religion, sex, national origin, political affiliation or belief, age, or handicap. The Contractor shall post in conspicuous places available to employees and applicants for employment, notices setting forth these EEO provisions. (2) The Contractor in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, political affiliation or belief, age, or handicap.

(i) No Third Party Right Created. This Contract is intended for the benefit of the City and the Contractor and not any other person.

(j) Principles of Interpretation. In this Contract, unless the context requires otherwise the singular includes the plural and the plural the singular. The pronouns "it" and "its" include the masculine and feminine. Reference to statutes or regulations include all statutory or regulatory provisions consolidating, amending, or replacing the statute or regulation. References to contracts and agreements shall be deemed to include all amendments to them. The word "person" includes natural persons, firms, companies associations, partnerships, trusts, corporations, governmental agencies and units, and any other legal entities.

(k) Modifications, Entire Agreement. A modification of this Contract is not valid unless signed by both parties and otherwise in accordance with requirements of law. Further, a modification is not enforceable against the City unless the City Manager or other duly authorized official signs it for the City. This Contract contains the entire agreement between the parties pertaining to the subject matter of this Contract. With respect to that subject matter, there are no promises, agreements, conditions, inducements, warranties, or understandings, written or oral, expressed or implied, between the parties, other than as set forth or referenced in this Contract.

(l) Corporate Seal. If a corporate seal is included by any party to this Contract, it is only for authentication purposes. This Contract is not signed under seal.

(m) No Employment Relationship. For all matters relating to this Agreement, Contractor shall be deemed an Independent Contractor. Nothing in this Agreement shall be construed in such a manner as to create an employee-employer relationship between City and Contractor.



**(The following section applies to construction contracts only if amount is over \$50,000)**

**Sec. 16. Bonding.** Both performance and payment bonds for the full amount of this Contract are required to be attached. Instead of bonds, you may submit a deposit of money, certified check or government securities for the full amount of the Contract. The performance bond shall have a value equal to 100% of this Contract. This bond shall be conditioned upon faithful performance of the Contract in accordance with the plans, specifications and conditions of the Contract. The performance bond shall be solely for the protection of the City. The payment bond shall be in an amount equal to 100% of the Contract, and conditioned upon the prompt payment for all labor or materials for which a contractor or subcontractor is liable. The payment bond shall be solely for the protection of the persons furnishing materials or performance labor for which a contractor or subcontractor is liable.

**Sec. 17. Dispute Resolution.** It is understood and agreed that NCGS 143-128(f1-g) requires that disputes arising under an agreement for the erection, construction, alteration or repair of a building be subject to a dispute resolution process specified by the City. The amount in controversy shall be at least \$15,000.00 before this dispute resolution procedure may be used. In compliance with this statutory provision, the City specifies this Section as the dispute resolution process to be used on this Project. It is further understood and agreed that this dispute resolution process is based on non-binding mediation and will only be effective to the extent that the Parties to any mediated dispute participate in the mediation in good faith. It is also understood and agreed that the City is under no obligation under any circumstance to secure or enforce the participation of any other Party in the mediation of any dispute subject to this Section and NCGS 143-128(f1-g).

**This Section 17 does not apply to:**

**(a) The purchase and erection of prefabricated or relocatable buildings or portions of such buildings, except that portion of the work that must be performed at the construction site; or**

**(b) The erection, construction alteration or repair of a building when the cost of such building is \$300,000 or less.**

17.1 Any dispute arising between or among the Parties listed in Section 17.3 that arises from an agreement to construct the Project, including without limitation a breach of such agreement, shall be subject to non-binding mediation administered by the American Arbitration Association under its Construction Industry Mediation Rules (“Rules”), except as otherwise expressly set forth in this Section. To the extent any provision of the Rules is inconsistent with the provisions of this Section, the provisions of this Section shall control. The mediation provided in this Section shall be used pursuant to this Agreement and NCGS 143-128(f1-g) and is in lieu of any dispute resolution process adopted by the North Carolina State Building Commission, which process shall not apply to this Project.

17.2 For purposes of this Section the following definitions shall apply:

a. *Agreement to construct the Project* means an agreement to construct the Project that is subject to the requirements of NCGS 143-128 and does not include any agreement related to the Project that is not subject to said statute.

b. *Construct or construction* refers to and includes the erection, construction, alteration or repair of the Project.

c. *Party or Parties* refers to the parties listed in Section 16.4.

d. *Project* means the building to be erected, constructed, altered or repaired pursuant to this Agreement.

17.3 The City and any Party contracting with the City or with any first-tier or lower-tier subcontractor for the construction of the Project agree to participate in good faith in any mediation of a dispute subject to this Section and NCGS 143-128(f1-g), including without limitation the following Parties (if any): architect(s), engineer(s), surveyor(s), construction manager, construction manager at risk, prime contractor(s), surety(ies), subcontractor(s), and supplier(s).

17.4 In order to facilitate compliance with NCGS 143-128(f1-g), the Contractor and all other Parties shall include this Section 17 in every agreement to which it (any of them) is a Party for the construction of the Project without variation or exception. Failure to do so will constitute a breach of this Agreement, and the Contractor or other Party failing to include this Section in any agreement required by this Section shall indemnify and hold harmless the remaining Parties from and against any and all claims, including without limitation reasonable attorney fees and other costs of litigation, arising in any manner from such breach. Notwithstanding the foregoing provisions of this Section, it is expressly understood and agreed that the Parties are intended to be and shall be third-party beneficiaries of the provisions of this Section and can enforce the provisions hereof.

17.5 The following disputes are not subject to mediation: (i) a dispute seeking a non-monetary recovery; and (ii) a dispute seeking a monetary recovery of \$15,000 or less.

17.6 A dispute seeking the extension of any time limit set forth in an agreement to construct the Project shall be subject to mediation pursuant to this Section and NCGS 143-128(f1-g), but only if the damages which would be suffered by the Party seeking the extension would exceed \$15,000 if the disputed extension is denied. To the extent that liquidated damages are set forth in such agreement as the measurement of damages for failure by such Party to meet such time limit, such liquidated damages shall be the exclusive standard for determining the amount of damages associated with such dispute.

17.7 For purposes of this Section, a dispute is limited to the recovery of monetary damages from the same transaction or occurrence against a single Party or two or more Parties alleged to be liable jointly, severally or in the alternative. Two or more disputes may not be consolidated or otherwise combined without the consent of all Parties to such disputes.

17.8 In addition to such matters as are required by the Rules, a request for mediation shall include the amount of the monetary relief requested.

17.9 Prior to requesting mediation, a Party must form a good faith belief that it is entitled under applicable law to recover the monetary amount to be included in the request from one or more of the remaining Parties. Such belief must be based on a reasonable and prudent investigation into the dispute that is the subject of the request. The request for mediation must be based on such investigation and may not include any amount or the name of any remaining Party, unless supported by such investigation and good faith belief by the Party requesting the mediation.

17.10 If a Party breaches any provision of Section 17.9, it shall indemnify and hold harmless all other Parties from any costs, including reasonable attorney fees and other costs of litigation, and damages incurred by such other Parties that arise from such breach.

17.11 All expenses incurred by a Party to a dispute in preparing and presenting any claim or defense at the mediation shall be paid by the Party. Such expenses include without limitation preparation and production of witnesses and exhibits and attorney fees. All other expenses of the mediation, including filing fees and required traveling and other expenses of the mediator, shall be borne as follows: one half by the Party requesting the mediation, with the remaining parties paying equal shares of the remaining expenses and costs; provided that, if the City is named as a party to the mediation, the City shall pay at least one-third of the mediation expenses and costs divided among the Parties. If more than one Party to a dispute requests a mediation, the mediation expenses and costs to be divided among the Parties shall be borne equally by the Parties to the dispute; provided that, if the City is named as a Party to the mediation, the City shall pay at least one-third of the mediation expenses and costs divided among the Parties.

17.12 The mediation shall be held at a location agreeable to the mediator and all of the Parties; provided that, if no agreement can be reached, the mediation will be held at such location in Cabarrus County as the mediator shall determine.

17.13 The provisions of this Section are subject to any other provision of this Agreement concerning the submission, documentation and/or proof of any claim or dispute. Such other provisions shall apply in full force and shall be satisfied as a condition precedent to mediation pursuant to this Section.

17.14 The Parties understand and agree that mediation in accordance with this Section shall be a condition precedent to institution of any legal or equitable proceeding seeking monetary recovery based on any dispute that is subject to mediation pursuant to this Section.

**Sec. 18. Breach.** In the event of a violation of any material term of this Agreement, the non-violating party may terminate the Agreement upon written notice. Such notice shall state the violation with specificity and shall give ten (10) days to cure the violation. The cure period shall be measured as ten (10) days from the date of receipt of notice by the violating party, or, if the date is not known, then thirteen (13) days from the date the notice is placed in the United States Post. If the violation remains uncorrected at the end of the cure period, the Agreement shall be terminated without any further action by the non-violating party. Any remaining disputes shall be subject to the dispute resolution procedure set forth above, if applicable.

[Signature Page to Follow]

IN WITNESS WHEREOF, the City of Concord and the Contractor have caused this Contract to be executed by their respective duly authorized agents or officers.

CITY OF CONCORD:

(Typed or Printed Legal Name of Contractor)

By: \_\_\_\_\_  
City Manager

By: \_\_\_\_\_  
Signature of President/Vice President/Manager/Partner

Date: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

ATTEST BY:

Date: \_\_\_\_\_

\_\_\_\_\_  
City Clerk

ATTEST:

BY: \_\_\_\_\_  
Signature of Vice President, Secretary, or other officer

APPROVED AS TO FORM:

Printed Name: \_\_\_\_\_

\_\_\_\_\_  
Attorney for the City of Concord

Title \_\_\_\_\_

SEAL

**APPROVAL BY CITY FINANCE OFFICER**

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

\_\_\_\_\_  
Signature

**EXHIBIT "D"**

STATE OF NORTH CAROLINA

AFFIDAVIT

COUNTY OF CABARRUS

\*\*\*\*\*

I, \_\_\_\_\_ (the individual signing below), being duly authorized by and on behalf of \_\_\_\_\_ (the legal name of the entity entering the contract, "Employer") after first being duly sworn hereby swears or affirms as follows:

- 1. Employer understands that E-Verify is the federal E-Verify program operated by the United States Department of Homeland Security and other federal agencies, or any successor or equivalent program used to verify the work authorization of newly hired employees pursuant to federal law in accordance with NCGS §64-25(5).
- 2. Employer understands that Employers Must Use E-Verify. Each employer, after hiring an employee to work in the United States, shall verify the work authorization of the employee through E-Verify in accordance with NCGS§64-26(a). Employer attests that Employer is in compliance with the requirements of the federal and state laws relevant to E-verify.
- 3. Employer is a person, business entity, or other organization that transacts business in the State of North Carolina. Employer employs 25 or more employees in this State. (mark Yes or No)
  - a. YES \_\_\_\_\_, or
  - b. NO \_\_\_\_\_.
- 4. Employer attests that all subcontractors employed by it as part of this contract comply with the requirements of E-Verify, and Employer will ensure compliance with E-Verify by any subcontractors subsequently hired by Employer as part of any contract with the City of Concord.
- 5. Employer shall have a continuing duty to inform the City of Concord of any changes to this sworn information.

This \_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Signature of Affiant  
Print or Type Name: \_\_\_\_\_

State of North Carolina County of Cabarrus

Signed and sworn to (or affirmed) before me, this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

My Commission Expires:

\_\_\_\_\_

Notary Public

\_\_\_\_\_

(Affix Official/Notarial Seal)

**EXHIBIT “E”**

**TAX FORM(S)**

**EXHIBIT “F”**

**CERTIFICATE OF INSURANCE**