FAYETTEVILLE PUBLIC WORKS COMMISSION
FAYETTEVILLE, NORTH CAROLINA

SPECIFICATIONS AND BID DOCUMENTS FOR THE BUTLER WARNER GENERATION PLANT BESS PROJECT

ISSUED FOR BIDS

FAYETTEVILLE PUBLIC WORKS COMMISSION
FAYETTEVILLE, NORTH CAROLINA

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ISSUED FOR BIDS

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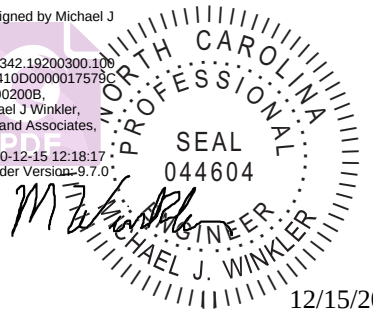


12/15/2020

Rev 1 : 12/15/2020 : Updated Definitions/Dates : MJW
Rev 2 : 12/15/2020 : Updated Dates : MJW

Booth & Associates, LLC
5811 Glenwood Avenue
Raleigh, North Carolina 27612

FAYETTEVILLE PUBLIC WORKS COMMISSION
FAYETTEVILLE, NORTH CAROLINA

SPECIFICATIONS AND BID DOCUMENTS FOR FOR THE BUTLER WARNER GENERATION PLANT BESS PROJECT

TABLE OF CONTENTS

TITLE	PAGE NO.
Notice to Prospective Bidders…….	N - 1
Instructions to Bidders…….	IB - 1-6
General Conditions……...	GC - 1-6
Special Conditions……...	SC - 1-6
Definitions……...	D - 1-2
Bidder's Proposal……...	P - 1-6
Form of Exceptions……...	P - 6
North Carolina Bid Bond……...	P – 7
Bid and Construction Schedule…….	B - 1
Contract Documentation……	C – 1-11

TECHNICAL SPECIFICATIONS

1.0	Scope……..….	S – 1
2.0	General Conditions……..…	S – 1
3.0	Special Conditions……..……	S – 2-3
4.0	Standards…….…...	S – 3
5.0	Drawings…….……...	S – 4-5
6.0	Shipping of Equipment ……..……...	S – 5
7.0	Manufacturer's Field Representative…….	S – 5-6
8.0	Equipment Rating…….……..……	S – 6-7
9.0	Equipment Capability…….…….	S – 7-9
10.0	Interface, Controls, Connections…….….	S – 9-10
11.0	Operation……..	S – 10
12.0	System Protection……..……..	S – 10-14
13.0	Other Equipment Details……..	S – 14-16
14.0	Start-up and Commissioning……..	S – 16

EXHIBITS

1 Conceptual Single-Line
2 Butler Warner Generation Plant – Proposed Project Area
3 Vender Product Data Form

NOTICE TO PROSPECTIVE BIDDERS

Pursuant to NCGS 143-129, Sealed Proposals will be received by the Fayetteville Public Works Commissions of the City of Fayetteville, Fayetteville, North Carolina at **2:00 p.m., local time, Tuesday, January 26, 2021**, outside of the PWC Administration Building, 955 Old Wilmington Rd, Fayetteville, NC, by the entrance doors, at which time they will be publicly opened and read for the furnishing and delivery of all materials, equipment, and services (except materials and equipment specified to be furnished by the Owner) complete and conforming to the Specifications herein for the Battery Energy Storage System (BESS), all as set forth in the Bid Schedules. Any Proposal received subsequent to that time will be promptly returned to the Bidder unopened.

Specifications and Bid Documents may be obtained from the PWC Procurement Department, at https://www.faypwc.com/purchasing and in the offices of the Fayetteville Public Works Commission's Procurement Department, 1st Floor, PCW Administration Building, 955 Old Wilmington Road, Fayetteville, North Carolina, between the hours of 8:00a.m. and 5:00p.m., Monday through Friday. Specifications and Proposal forms may be also be secured from the office of Booth & Associates, LLC, 5811 Glenwood Avenue, Raleigh, North Carolina 27612. Additional copies may be obtained for a non-refundable charge of Fifty Dollars ($50.00) or may be examined at the offices of the Fayetteville Public Works Commission.

Each Proposal shall be accompanied by cash, cashier's check, or certified check drawn on a bank insured by the Federal Deposit Insurance Corporation or Savings Association Insurance Fund. Checks shall be payable to the Fayetteville Public Works Commission, North Carolina, in an amount not less than five percent (5%) of the total bid as a guarantee that a Contract, if awarded, will be accepted. In lieu thereof, a Bid Bond, which conforms to the provisions of G.S.143-129 as amended by Chapter 1104 of the Public Laws of 1951, may be submitted by the Bidder.

The successful Bidder shall be required to submit a separate Performance Bond and Payment Bond in an amount equal to 100% of the contract amount.

Proposals must be enclosed in a sealed envelope and are to be marked **"PROPOSAL FOR THE BUTLER WARNER GENERATION PLANT BESS PROJECT, NOT TO BE OPENED UNTIL 2:00 P.M., TUESDAY, JANUARY 26, 2021".** Bidders are to mail or deliver their Proposals as follows: Fayetteville Public Works Commission, in Fayetteville, NC: Attn: Nikole Subject, Procurement Advisor, 955 Old Wilmington Road, Fayetteville, NC 28301

All late Bids shall be returned unopened to the sender. Regardless of the bidder's chosen means of delivery, a bidder assumes responsibility for delivery to the advertised location by the advertised deadline. If the delivery service cannot deliver the bid to the proper location by the deadline, the bid must be rejected as untimely, and shall be returned unopened to the sender.

The Fayetteville Public Works Commission reserves the right to reject any or all bids and to waive all formalities concerning bid, or award bid to the lowest responsible Bidder or Bidders taking into consideration quality, performance, and the time specified in the Proposals for the performance of the Contract.

FAYETTEVILLE PUBLIC WORKS COMMISSION
FAYETTEVILLE, NORTH CAROLINA

By Trent Ensley
Purchasing Manager

Date: December 15, 2020

INSTRUCTIONS TO BIDDERS

1.0 Proposals

1.1 To warrant consideration, only those Proposals made in accordance with these instructions will be considered.

1.2 Proposals must be made on the Form of Proposal provided herein, or an exact copy thereof, and must not be altered, erased, or interlined in any manner. The Contractor shall fill in the Form of Proposal as detailed in the instructions. The Bidder may retain one (1) copy, but the original, fully executed, must be inserted or be attached to the Specification Documents. In addition, two (2) additional copy of all executed forms and supporting information shall be submitted with the original.

1.3 The Bidder shall furnish certain information, as required by the Specifications, regarding the equipment which he is bidding. Two copies of the information, together with the manufacturer's literature setting forth the guarantees and describing the equipment which he is bidding shall be included as part of the Proposal. Each bid must include the vendor's proposal and a copy of the manufacturer's information or specifications even if another bidder is quoting the same manufacturer. Additional sets of the Specifications may be obtained by contacting Nikole Subject, Procurement Advisor, at (910) 635-9882 or by email at nikole.subject@faypwc.com.

1.4 Additional copies of these Specifications may be obtained upon request from the Engineer upon payment of a fifty dollar ($50.00) non-refundable fee per copy.

Proposals shall include a Form of Exceptions utilizing forms provided herein which shall itemize each and every exception from the Specifications. The Form of Exceptions shall state the section, subsection, and paragraph designations from the part of the Specifications to which exception is taken and explain in detail the nature of the exception. A copy of this Form of Exceptions is included in the Form of Proposal. Exceptions will not necessarily eliminate a Bidder from consideration, even if bids without exceptions are received from others. The treatment of exceptions will be based entirely on the overall best interests of the Commission. The Commission reserves the right to accept or reject any proposal.

1.5 Bids may only be modified in writing, contained in a sealed envelope, received prior to the time of bid opening which upon receipt shall be included in the public reading of bids. No oral or telephonic Proposals or modifications will be considered.

1.6 Should the Bidder find discrepancies in or omissions from the Drawings or Documents or should he be in doubt as to their meaning, he shall at once notify Nikole Subject, Procurement Advisor, at (910) 635-9882, or by e-mail to nikole.subject@faypwc.com who will send written instructions to all Bidders. Neither the Commission nor the Engineer will be responsible for any oral instructions. If Plans and Specifications are found to disagree after Contract is awarded, the Commission shall be the judge as to what was intended. The Successful Bidder is hereby made responsible for the furnishing of the necessary labor, tools and equipment reasonably inferred or evidently necessary for the proper execution and completion of the work; for any additional work involved in the correction of apparent errors or inconsistencies, and in executing the true intent and meaning of the Drawings and Specifications as interpreted by the Commission and all such labor and equipment shall be provided at the Contractor's expense, and under no condition will any such labor and equipment be allowed as an extra.

1.7 The Bidder's proposal should include the intended layout of the proposed equipment drawn on top of the site drawing Exhibit 3 utilizing Future Expansion site 1 and expand the design to Future Expansion site 2 as needed. The bid shall also include an updated conceptual one-line using Exhibit 2 as reference and fill out the Vendor Product Data Sheet Exhibit 4 to be considered responsive.

1.8 Invoice shall list the appropriate state sales tax as a separate item.

1.9 The prices as quoted herein:

a. Are firm unless otherwise stated.
b. Do include the cost of delivery to the site at the Bidder's Risk.

1.10 Modifications to bids must be by removal of the Bidder's original bid and the submittal of a completely revised bid package in full compliance with the Plans, Specifications, and Bid Documents. This is required prior to the time of opening bids. No oral or telephonic Proposals will be accepted.

1.11 The Materialman further declares that he has examined the site or site plan of the work and informed himself fully regarding all conditions pertaining to the locations where the work is to be done, examined the Technical Specifications for the work and the Contract Documents relative thereto, read all special provisions furnished prior to the opening of the bids, and satisfied himself relative to the work to be performed.

1.12 The materials will conform to the Technical Specifications sections attached hereto and made a part hereof.

1.13 After opening, bids may only be withdrawn in accordance with N.C.G.S. 143-129.1.

2.0 Bid Security

2.1 Each Proposal shall be accompanied by a cashier's check, or certified check drawn on a bank or trust company insured by the Federal Deposit Insurance Corporation, or the Savings Association Insurance Fund, or a Bid Bond in an amount equal to not less than five (5%) of the total amount of the Proposal; said deposit to be retained by the Owner as liquidated damages in event of failure of the Successful Bidder to execute the Contract within ten (10) days after the award.

2.2 Bid Bond shall be conditioned that the Surety will upon demand forthwith make payment to the Obligee upon said Bond if the Bidder fails to execute the Contract in accordance with the Bid Bond, and upon failure to immediately make payment, the Surety shall pay to the Obligee an amount equal to double the amount of said Bond. Standard Form of Bid Bond is included in these Specifications.

2.3 Only one (1) bid Surety is required, the amount of which shall be based on the total amount of all bid schedules.

3.0 Bulletins and Addenda

Any bulletins issued during the time of bidding or addenda to Specifications are to be considered covered in the Proposal, and in executing a Contract will become a part thereof. Receipt of addenda shall be acknowledged by the Bidder on the Contractor's proposal.

4.0 Delivery of Equipment

The prices quoted shall include delivery of the equipment F.O.B. Point of Delivery, Fayetteville, North Carolina. The Bidder's Proposal shall be quoted including delivery to the Fayetteville Public Works Commission's Butler Warner Generation Plant, located at 2274 Custer Ave, Fayetteville, NC 28312 as outlined in the Specifications.

Delivery of all items of equipment shall be made at such time as to permit unloading between the hours of 9:00 a.m. and 3:00 p.m., Monday through Friday, holidays excluded. The Bidder shall give forty-eight (48) hours notice of all deliveries.

The Bidder shall be responsible for securing permits required for unloading and transportation of the equipment.

Receipt of "Approval Drawings" by the Bidder constitutes authorization for manufacture only, predicated upon the Drawings and corrections found thereon. Tentative release for shipment is to be granted by either the Owner or the Owner's Engineer, based upon the following:

a) Furnishing of the requested number of copies of the Final Drawings as called for in the Specifications.

b) Coordination of manufacturing and delivery with Fayetteville Public Works Commission's construction schedule as may be noted in these Specifications.

c) Thirty (30) days notification of tentative shipping schedule and forty-eight (48) hours notification prior to delivery.

5.0 Award of Contract

5.1 The award of the Contract will be made to the lowest responsive, responsible Bidder as soon as practicable. The bid shall be awarded to the Bidder who, in the judgment of the Owner, offers the best value to the Owner. Factors to be considered by the Owner are specified in Paragraph 5.3. The Owner reserves the right to reject any and all bids.

5.2 The Owner reserves the right to waive minor irregularities or minor errors in any Proposal if it appears to the Owner that such irregularities or errors were made through inadvertence. In all cases concerning cost, unit price shall be the governing factor if a discrepancy exists between the extension of unit cost, times quantity.

5.3 In determining the most responsive, responsible Bidder, the Owner will consider, in addition to the prices quoted in the Proposal the following:

a. Cost of ownership, including financing for the BESS.
b. Delivery date of equipment
c. Adherence to the Plans and Specifications
d. Suitability of materials and equipment
e. Firm prices
f. Additional extended warranty
g. Accessibility of service facilities and personnel
j. History of prior equipment performance

5.4 Engineer's Plans and Specifications, such proposed changes or deviations must be submitted at the time bids are opened on the Form of Exceptions included. The Owner reserves the right to reject any proposed changes or deviations. All exceptions must be stated on the Form of Exceptions. Failure to provide a Form of Exceptions with the Proposal shall imply strict adherence to all details of the Plans and Specifications.

5.5 The Contract, when awarded, shall be deemed to include the Specifications for the equipment, and the Bidder shall not claim any modification thereof resulting from any representative or promise made at any time by any officer, agent, or employee of the Owner or by any other person.

6.0 Performance and Payment Bonds

6.1 The Contractor, at the time of the execution of the Contract shall be required to furnish a Performance Bond and Payment Bond in an amount equal to at least one-hundred percent (100%) of the Contract price as security for the faithful performance of this Contract and as security for the payment of all persons performing labor and furnishing materials and equipment in connection with this Contract in accordance with N.C.G.S. Chapter 44A, Article 3.

6.2 The corporate surety furnishing the bonds shall be authorized to do business in the state of North Carolina and shall be acceptable to the Commission. All contract payment bonds and contract performance bonds shall be executed on "Performance Bond" and "Payment Bond" forms provided in the Contract Documents (or attached thereto) and be countersigned by a regularly authorized agent of the corporate surety who is resident in North Carolina and who is licensed by the North Carolina Department of Insurance.

6.3 In all Performance and Payment Bonds, the provision that no suit, action, or proceeding by reason of any default whatsoever shall be brought on this Bond after a specified number of

months shall be fixed at twelve (12) months. The face value of the Bond shall be one-hundred percent (100%) of the Contract price for a period of twelve (12) months following the day when the last of the labor was performed, or equipment was furnished, or final settlement was made with the Contractor, whichever occurs last.

6.4 Whenever the Surety or Sureties on the bond so furnished shall be deemed by the Commission to be insufficient or unsatisfactory, the Contractor, within ten (10) days after notice to that effect shall furnish and deliver a new bond to the Commission in the same penalty and on the same conditions with Surety satisfactory to the Commission and this duty shall continue on the part of the Contractor, whenever and so often as the Commission shall require a new bond with a satisfactory Surety or Sureties. If the Contractor shall fail to furnish such bond, within ten (10) days after said notice is mailed to his address, the Commission through its proper agent or agents, may stop all further work under said Contract and complete the unfinished work at the expense of the Contractor.

6.5 Whenever the Surety or Sureties on the bond so furnished shall be deemed by the Commission to be insufficient or unsatisfactory, the Contractor, within ten (10) days after notice to that effect shall furnish and deliver a new bond to the Commission in the same penalty and on the same conditions with Surety satisfactory to the Commission and this duty shall continue on the part of the Contractor, whenever and so often as the Commission shall require a new bond with a satisfactory Surety or Sureties. If the Contractor shall fail to furnish such bond, within ten (10) days after said notice is mailed to his address, the Commission through its proper agent or agents, may stop all further work under said Contract and complete the unfinished work at the expense of the Contractor.

7.0 Examination of Conditions

Prior to the submission of the Proposal, the Bidder shall make and shall be deemed to have made a careful examination of the Plans and Specifications on file with the Commission and with the Engineer, and all other matters that may affect the cost and the time of completion of the work.

8.0 Time for Completion

The time of completion of the project shall be as specified in the Form of Proposal.

9.0 Bids to be Retained

No bid may be withdrawn after the scheduled closing time for the receipt of bids for a period of ninety (90) days pending the execution of a Contract by the Successful Bidder. Should the Successful Bidder default and not execute a contract, then the Contract may be offered to the next lowest responsible Bidder whose Proposal is evaluated as acceptable.

10.0 Materialman's Proposal Form

Those bids not received on Fayetteville PWC Materialman's Proposal Form contained herein, or an exact copy thereof, will be considered unresponsive. The forms shall be filled out completely. Any omissions may cause the entire Proposal to be rejected.

11.0 Questions

Questions regarding this bid must be submitted in writing to the attention of Nikole Subject, Procurement Advisor, by fax to (910) 483-1429, or by email to nikole.subject@faypwc.com no later than 5:00 pm, January 8, 2021. Any interpretations of questions so raised, which in the opinion of Project Engineer require interpretations, will be issued by Addenda mailed or delivered to all parties recorded by Owner and/or Design Engineer as having received the Contract Documents, not later than one (1) day prior to receipt of Bids. An Addendum extending the date for the receipt of Bids or an Addendum withdrawing the Invitation to Bid may be issued any time prior to the date set for the receipt of Bids. Owner and Design Engineer will not be responsible for oral interpretations or clarifications, which anyone presumes to make on their behalf. **Bidders are expressly prohibited from contacting any PWC Official or employee associated with this project, except as noted above. Violation of this prohibition is grounds for the immediate disqualification of the bidder.**

12.0 Additional Purchase Clause

The Commission reserves the right to purchase additional units as specified herein within a one year period of contract award, upon the agreement of both parties.

13.0 Contractor's Proposal Form

Those bids not received on the Booth & Associates, LLC Contractor's Proposal Form contained herein or an exact copy thereof shall be considered unresponsive. The forms shall be filled out completely. Any omissions may cause the entire Proposal to be rejected.

14.0 Contractor's Insurance

14.1 The Contractor shall take out and maintain during the life of this Contract, Workmen's Compensation, General Liability, Property Damage and Motor Vehicle Liability Insurance.

This contract will terminate if any of the aforementioned insurance coverage's are cancelled or expired.

14.2 Workmen's Compensation Insurance shall include all of the Contractor's employees employed at the site of the project under his Contract. In case any class of employees engaged in hazardous work under this Contract at the site of the project is not protected under the Workmen's Compensation Statute, the Contractor shall provide adequate coverage for the protection of his employees not otherwise protected.

14.3 General Liability and Property Damage Insurance shall be in such amounts as to adequately protect the Owner and the Contractor from claims for damages for personal injury, including accidental death, as well as from claims for property damages which may arise from operations under this Contract, whether such operations be by himself or by anyone directly or indirectly employed by him. The amount of such insurance shall not be less than the following:

General Liability Insurance for bodily injury or death $2,000,000 per occurrence, and $5,000,000 for each aggregate.

Property Damage Insurance $3,000,000 for each aggregate and $5,000,000 aggregate for accidents during the policy period.

GL Policy shall include product and completed operations coverage.

14.4 Motor Vehicle Liability Insurance shall be for not less than the following amounts:

Bodily injury or death $1,000,000 per occurrence and $2,000,000 for each aggregate.

Property damage is $2,000,000 for each aggregate.

14.5 Copies of Certificates of Insurance for all aforementioned policies shall be furnished by the Contractor and shall be attached to the respective pages of the Contract Agreement at the time of signing.

14.6 It shall be understood that the above-required insurance shall not be canceled or changed until thirty (30) days after written notice of such termination or alteration has been sent by registered mail to the certificate holder.

14.7 The Contractor shall secure, at his expense, and shall maintain during the life of the Contract, co-insurance for the Public Works Commission of the City of Fayetteville, and the Design Engineer name and included as additional insured. The amounts shall be the same as previously specified.

15.0 Contractor's License

In accordance with the State of North Carolina General Statutes, Contractors performing work of this caliber in the State must be licensed to do so. The Contractor must possess a Public Utilities

Electrical Contractors License. A current copy of the Contractor's State of North Carolina Board for General Contractor's license must be submitted with this Proposal and included in the Proposal section. Additionally, a valid license must be maintained during the course of the work.

Contractor represents and warrants that it is fully experienced in projects of the nature, scope and magnitude of the Work, properly qualified, registered, licensed, equipped, organized and financed to perform the Work.

1.0 Drawings and Specifications

The Drawings and Specifications are complementary, one to the other. That which is shown on the Drawings or called for in the Specifications shall be as binding as if it were both called for and shown. The intention of the Drawings and Specifications is to include all labor, materials, transportation, equipment and any and all other items necessary to do a complete job. In case of discrepancy or disagreement in the Contract Documents, the order of precedence shall be: Form of Contract, Technical Specifications, Large Scale Detail Drawings, and Small Scale Drawings.

2.0 Clarifications and Detailed Drawings

In such cases where the nature of the work requires clarification by the Engineer, such clarification shall be furnished by the Engineer with reasonable promptness by means of written instructions or Detail Drawings or both. Clarifications and Drawings shall be consistent with the intent of Contract Documents, and shall become a part thereof.

3.0 Change in Plans and/or Specifications

The Owner, or the Engineer on behalf of the Owner, may make changes to Plans and/or Specifications after award of the Contract or while construction is in progress. The compensation for such changes shall be agreed upon in writing between the Contractor and the Owner prior to commencement of work involving the change. No payment shall be made to the Contractor for correcting work not in compliance with Specifications. Once the change of work has been agreed upon between all parties, the Engineer will initiate a change order.

Records of conditions above and below ground, water records or other observations which may have been made by or for Owner shall be made available to Contractor for its information, upon request. Site subsurface conditions which differ materially from the results reasonably indicated in any reports furnished by Owner or undertaken by Contractor shall be deemed to be changed work.

Except as otherwise set forth in the Contract, all loss or damage to Contractor arising out of the Work or from the action of the elements, or from any unforeseen circumstance in the prosecution of the Work including inefficiencies or claims of inefficiencies, shall be sustained and borne by Contractor at its own cost and expense.

3.1 Change in Contract Price

3.1.1 The Contract Price may only be changed by a Change Order. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price shall be determined as follows:

1. Where the Work involved is covered by unit prices contained in these Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Part 9); or

2. Where the Work involved is not covered by unit prices contained in these Contract Documents, by mutually agreed unit prices or lump sum (which may include an allowance for overhead and profit); or

3. Where the Work involved is not covered by unit prices contained in these Contract Documents and agreement to a unit price or lump sum is not reached, on the basis of the Cost of the Work, plus a CONTRACTOR's fee for overhead and profit.

3.1.2 CONTRACTOR shall establish and maintain records in accordance with generally accepted accounting practices and submit in a form acceptable to OWNER an itemized cost breakdown together with supporting data. OWNER

may audit CONTRACTOR's records related to such costs during normal business hours.

3.1.3 The CONTRACTOR's total fee for overhead and profit shall not exceed 15% of the value of the additional work.

3.1.4 OWNER or CONTRACTOR may make a Claim for an adjustment in the Contract Price in accordance with Part 8 if:

1. The quantity of any item of Unit Price Work performed by CONTRACTOR differs materially and significantly plus or minus fifty (50) percent from the estimated quantity of such item indicated in the Bid Form;

2. There is no corresponding adjustment with respect to any other item of Work; or

3. If CONTRACTOR believes that CONTRACTOR is entitled to an increase in Contract Price as a result of having incurred additional expense or OWNER believes that OWNER is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

3.1.5 No increase in Contract Price shall be granted for Inexcusable Delays, unless otherwise agreed to by OWNER.

3.1.6 That the final completion date is a business day.

4.0 Payment

4.1 Payment by the Owner to the Successful Bidder shall be made periodically based on the actual percentage of completion, and upon demonstration that any equipment or materials furnished meet the Specifications.

4.2 In accordance with N.C.G.S. 143-134.1, the Commission will retain five percent (5%) of the amount of each monthly periodic payment. The Commission, after fifty percent (50%) of the work has been completed, will consider waiving further retainage on the project upon the following conditions: (1) written consent of surety is received; (2) satisfactory progress is being made on the Project; and (3) prior to fifty percent (50%) completion, any nonconforming work identified in writing by the Engineer has been corrected by the Contractor and accepted by the Engineer. If retainage is discontinued or reduced, the Commission reserves the right to reinstate retainage up to the five percent (5%) level if the Contractor performs unsatisfactorily. Furthermore, the Commission reserves the right to continue to retain payment, even in the event the Contractor's work is satisfactory, in order to ensure a total of two and one-half percent (2.5%) retainage over the life of the project. The Commission reserves the right to withhold additional payments for unsatisfactory job progress, defective construction not remedied, disputed work, or third-party claims filed against the Commission or reasonable evidence that a third-party claim will be filed.

4.3 The address for submittal of all invoices is Public Works Commission of the City of Fayetteville, 955 Old Wilmington Road, Fayetteville, North Carolina 28301, Attention: David Deschamps.

5.0 Working Drawings and Specifications at the Job Site

Contractor shall maintain, in readable condition at his office, one (1) complete set of as-built working Drawings and Specifications for his work. Such Drawings and Specifications shall be available for use by the Engineer or Owner.

6.0 Ownership of Drawings and Specifications

All Drawings and Specifications are instruments of service and remain the property of the Owner.

The use of these instruments on work other than this Contract without permission is prohibited. All copies of Drawings and Specifications other than Contract copies shall be returned to the Engineer upon request after completion of the work.

7.0 Materials, Equipment, And Employees

7.1 The Contractor shall, unless otherwise specified, supply and pay for all labor, equipment, transportation, tools, apparatus, lights, heat, sanitary facilities, water, and incidentals necessary for the entire proper and substantial completion of his work and shall install, maintain, and remove all equipment of the construction, other utensils or items and be responsible for the safe, proper, and lawful construction, maintenance, and use of same, and shall construct, in the best and most workmanlike manner, a complete job and everything incidental thereto, as shown on the Plans, stated in the Specifications, or reasonably implied there from, all in accordance with the Contract Documents. **All necessary materials are to be furnished by the Contractor as outlined in** the Technical Specifications, Paragraph 2.3.

7.2 The Contractor shall not use any "removed" materials in the completion of this project unless indicated as a transfer unit on the Plan & Profile Sheets. Materials damaged or lost during construction of the work due to carelessness of the Contractor's personnel, shall be replaced in kind by the Contractor at no cost to the Owner.

7.3 If at any time during the construction and completion of the work covered by these Specifications, the conduct of any workman of the various crafts is adjudged ungentlemanly and a nuisance to the Owner or the Engineer, or if any workman is considered incompetent or detrimental to the work, the Contractor shall order such parties to be immediately removed from the grounds.

7.4 Any superintendent or foreman of the Contractor who ignores or refuses to follow written instructions of the Engineer or his representative at the site shall be immediately removed and replaced.

7.5 The Contractor shall insure that at all times he has sufficient crew compliments, both in terms of numbers and experience of personnel to perform work tasks safely, both for workers and the general public. Any instance noted to the contrary of this requirement may result in the complete shutdown of work on the project.

8.0 Royalties, Licenses, and Patents

It is the intention of the Contract Documents that the work covered herein will not constitute in any way on an infringement on any patent whatsoever. The Contractor shall protect and save harmless the Owner against suit on account of alleged or actual infringement. The Contractor shall pay all royalties and/or license fees required on account of patented articles or processes, whether or not the patent rights are evidenced hereinafter.

9.0 Indemnification

9.1 To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless the Owner, Engineer, Engineer's Consultants and the officers, directors, employees, agents and other consultants of each and any of them from and against all claims, costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) caused by, arising out of or resulting from the performance of the Work, provided that any such claim, cost, loss or damage: (i) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting there from, and (ii) is caused in whole or in part by any negligent act or omission of Contractor, any Subcontractor, any Supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not caused in part by any negligence or omission of a person or entity indemnified

hereunder or whether liability is imposed upon such indemnified party by Laws and Regulations regardless of the negligence of any such person or entity.

9.2 In any and all claims against the Owner or Engineer or any of their respective consultants, agents, officers, directors or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 9.1 shall not be limited in any way by any limitations on the amount or type of damages, compensation or benefits payable by or for Contractor or any such Subcontractor, Supplier or other person or organization under workers' compensation acts, disability benefit acts or other employee benefit acts.

9.3 The indemnification obligations of Contractor under paragraph 9.1 shall not extend to the liability of Engineer and Engineer's Consultants, officers, directors, employees, or agents caused by the professional negligence, errors, or omissions of any of them.

10.0 Surveys

Unless otherwise specified, the Owner will furnish all surveys and locations for locating the principal component parts of the work. Stakes missing at the time of construction will be replaced within a reasonable amount of time after notification by the Contractor.

11.0 Uncorrected Faulty Work

The Contractor shall be notified of faulty or damaged work and shall have the option to respond in a reasonable period of time. Should the correction of faulty or damaged work be considered inadvisable or inexpedient by the Owner or the Engineer, the Owner shall be reimbursed by the Contractor for the same by a deduction in the Contract prices arrived at by a fair estimate of the probable cost of correction, approved by the Engineer.

12.0 Delays and Extension of Time

12.1 The time to be allowed for construction of these facilities is stated in the Instructions to Bidders. The Contractor, upon notice of award of Contract, shall prepare a construction schedule based on the allowed time, and submit such schedule to the Engineer for approval. A Pre-Construction Conference will be scheduled for all parties concerned. All construction must be completed in accordance with Section 9.0, Instructions to Bidders.

12.2 If the Contractor is delayed at any time in the progress of the work by any act of negligence by the Owner or the Engineer, or by any separate Contractor employed by the Owner or by changes ordered in the work, then the time of completion shall be extended for such reasonable time as the Engineer may decide.

12.3 No extension of time for completion will be made for ordinary delays and accidents. Extensions may be granted for delays ordered by the Owner or the Engineer if the request has been made in writing within forty-eight (48) hours after the order to cease work has been given.

13.0 Correction of Work Before Final Payment

13.1 Any work, materials, or other parts of the work which have been condemned or declared not in accordance with the Contract by the Owner or the Engineer shall be removed from the work site by the Contractor and shall be immediately replaced by new work in accordance with the Contract at no additional cost to the Owner. Work or property of others or the Owner damaged or destroyed by virtue of such faulty work shall be made good at the expense of the Contractor whose work is faulty.

13.2 Correction of condemned work described above shall commence within twenty-four (24) hours after receipt of notice from the Owner or the Engineer and shall be pursued to completion.

13.3 Final payment will not be made until certificates of the Engineer have been duly issued.

14.0 Correction Of Work After Final Payment

Neither the final certificate, final payment, acceptance of the premises by the Owner, nor any provision of the Contract, nor any other act or instrument of the Owner or Engineer shall relieve the Contractor from responsibility for negligence, or faulty materials or workmanship, or failure to comply with the Drawings and Specifications. He shall correct or make good any defects due thereto and repair any damage resulting there from which may appear during the period of the guarantee following final acceptance of the work by the Owner. The Owner will report any defects as they may appear to the Engineer who will give the instructions for a time limit for completion of corrections to the Contractor.

15.0 The Owner's Right To Perform Work

The Owner may perform or have performed by others work which is described in the Specifications to be performed by the Contractor, due to early delivery of equipment prior to the execution of this Contract. Upon the execution of the contract, the work performed will be deducted from the Contractor's price by the unit price set forth in the Contractor's Proposal Form.

If during the progress of the work or during the period of guarantee, the Contractor fails to execute the work properly or to perform any provision of the Contract, the Owner, after five (5) days' written notice to the Contractor from the Engineer or the Owner, may perform or have performed that portion of the work and may deduct the cost thereof from any amounts due or to become due the Contractor, such action and cost of same having been first approved by the Engineer. Should the cost of such action of the Owner exceed the amount due or to become due the Contractor, then the Contractor or his surety, or both, shall be liable for and shall pay to the Owner the amount of said excess.

16.0 Liquidated Damages

The time of the delivery of the final completion is of the essence of the Contract. Should the Bidder neglect, refuse or fail to deliver the final completion within the time herein agreed upon, after giving effect to extensions of time, if any, herein provided, then, in that event and in view of the difficulty of estimating with exactness damages caused by such delay, the Owner shall have the right to deduct from and retain out of such moneys which may be then due, or which may become due and payable to the Bidder the sum of dollars Five Hundred ($500) per day for each and every day that such delivery is delayed beyond the specified time, as liquidated damages and not as a penalty; if the amount due and to become due from the Owner to the Bidder is insufficient to pay in full any such liquidated damages, the Bidder shall pay to the Owner the amount necessary to effect such payment in full: Provided, however, that the Owner shall promptly notify the Bidder in writing of the manner in which the amount retained, deducted or claimed as liquidated damages was computed.

17.0 Contractor's Affidavit

The final payment of retained amount due the Contractor on account of the Contract shall not become due until the Contractor has furnished to the Owner, with a copy to the Engineer, an affidavit signed, sworn and notarized to the effect that all payments for materials, services, or any other reason in connection with his Contract have been satisfied and that no claims or liens exist against the Contractor in connection with this Contract. In the event that the Contractor cannot obtain similar affidavits from Subcontractors to protect the Contractor and the Owner from possible liens or claims against the Subcontractor, the Contractor shall state in his affidavit that no claims or liens exist against any Subcontractor to the best of his (the Contractor's) knowledge and if any appear afterwards, the Contractor shall save the Owner harmless on account thereof.

18.0 Assignments

The Contractor shall not assign any portion of this Contract nor subcontract it in its entirety. Except as may be required under terms of the Payment and/or Performance Bond, no funds or sums of money due or to become due the Contractor under this Contract may be assigned.

19.0 Engineer's Status

The Engineer has authority to stop the work whenever such stoppage may be necessary to insure the proper execution of the Contract. He shall also have authority to reject all work and materials which do not conform to the Contract, to direct the application of forces to any portion of the work as in his judgment is required, to order the forces increased or diminished, and to decide questions which arise in the execution of the work.

The Engineer is the interpreter of the conditions of the Contract and the judge of its performance, and he shall use his powers under the Contract to enforce its faithful performance.

20.0 Engineer's Decisions

The Engineer shall, within a reasonable time after their presentation to him, make decisions on all claims of the Contractor and on all other matters relating to the execution and progress of the work or the interpretation of the Contract Documents. All such decisions by the Engineer shall be final.

21.0 Right-Of-Way

The Owner will obtain all easements and/or right-of-way required for the project. The Owner shall be responsible for clearing all trees and brush as per Plans and Specifications.

22.0 Accidents

The Contractor shall provide at the site such equipment and medical facilities as are necessary to supply first-aid service to anyone who may be injured in connection with the work. The Contractor will provide a written report to the Owner of all accidents within twenty-four (24) hours of the event.

23.0 Equal Employment Opportunity

During the performance of this Contract, the Contractor agrees as follows:

23.1 The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, political affiliation or belief, age, or physical handicap. The Contractor will take affirmative action to insure that applicants are employed and that employees are treated during employment without regard to race, color, religion, sex, national origin, political affiliation or belief, age, or physical handicap. Such action shall include but not be limited to the following employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places available to employees and applicants for employment notices setting forth the provisions of the nondiscrimination clause.

23.2 The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, political affiliation or belief, age, or physical handicap.

23.3 The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or other understanding, a notice advertising the labor union or workers' representative of the Contractor's commitments under the Equal Employment Opportunity Section of this Contract and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

23.4 In the event of the Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of such rules, regulations, or orders, this Contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Owner contracts.

24.0 E-Verify Requirements - Vendor hereby acknowledges that "E-Verify" is the federal E-Verify program operated by the US Department of Homeland Security and other federal agencies which is used to verify the work authorization of newly hired employees pursuant to federal law and in accordance with Article 2, Chapter 64 of the North Carolina General Statutes. Vendor further acknowledges that all employers, as defined by Article 2, Chapter 64 of the North Carolina General

Statutes, must use E-Verify and, 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).

Vendor hereby pledges, attests and warrants through execution of this Agreement that Vendor complies with the requirements of Article 2, Chapter 64 of the North Carolina General Statutes and further pledges, attests, and warrants that any subcontractors currently employed by or subsequently hired by Vendor shall comply with any and all E-Verify requirements. Failure to comply with the above requirements shall be considered a breach of this Agreement.

25.0 Iran Divestment Act

As mandated by NCGS. 147-86.59(a), Consultant hereby certifies that it is not listed on the Final Divestment List created by the North Carolina State Treasurer pursuant to NCGS 147-86.58. Consultant further certifies that in accordance with NCGS 147-86.59(b) that it shall not utilize any sub-consultant found on the State Treasurer's Final Divestment List. Consultant certifies that the signatory to this Contract is authorized by the Consultant to make the foregoing statement.

26.0 Inspection at Materialman's Site

The Commission reserves the right to inspect, at a reasonable time, the equipment/item, plant or other facilities of a prospective Materialman prior to Contract award and during the Contract term as necessary for the Commission's determination that such equipment/item, plant or other facilities conform with the specifications/requirements and are adequate and suitable for the proper and effective performance of the Contract.

27.0 Advertising

Materialman agrees not to use the existence of this Contract or the name of the Commission as part of any commercial advertisement.

28.0 Access to Person and Records

An independent auditor shall have access to persons and records as a result of all Contracts or grants entered into by the Commission in accordance with General Statue 147-64.7.

29.0 **The Materialman** shall complete the attached Form of Exception which clearly states any deviance to Specifications proposed by the Bidder. Failure to state any deviance in the Materialman's Proposal from the Specifications assumes complete and total compliance with the requirements of the Specifications.

Bidder: _____

By: _____

Date: _____

1.0 Defective Workmanship

The acceptance of any workmanship by the Owner shall not preclude the subsequent rejection thereof if such workmanship shall be found to be defective after installation, and any such workmanship found defective before final acceptance of the work or within one (1) year after completion shall be remedied or replaced, as the case may be, by and at the expense of the Contractor. In the event of failure by the Contractor to do so, the Owner may remedy such defective workmanship and in such event the Contractor shall pay to the Owner the cost and expense thereof. The Contractor shall not be entitled to any payment hereunder so long as any defective workmanship, of which the Contractor shall have had notice, shall not have been remedied or replaced, as the case may be.

2.0 Materials

At or prior to the commencement of construction, the Owner shall make available to the Contractor all materials which the Owner has on hand, and from time to time as such additional deliveries of materials, if any, are received by the Owner, the Owner shall make such materials available to the Contractor; Provided, however, that the Contractor or his authorized representative shall give to the Owner a receipt in such form as the Owner shall approve for all materials furnished to the Contractor by the Owner. Upon completion of the project, the Contractor shall return all materials furnished by the Owner which are in excess of those required for the construction. Excess will be determined by comparison of Contractor's material receipts with final inventory as approved by the Owner. The Contractor shall also return to the Owner all material, usable and scrap, removed during construction. The Contractor will reimburse the Owner, at the current invoice cost to the Owner, for loss and/or breakage resulting from Contractor's negligence, of materials furnished to the Contractor by the Owner.

3.0 Defective Materials (Supplied by Contractor)

3.1 All materials supplied by the Contractor shall be subject to the inspection, tests and approval of the Owner. The Contractor shall furnish all information required concerning the nature or source of any materials and provide adequate facilities for testing and inspecting the materials at the plant of the Contractor.

3.2 The materials furnished hereunder shall become the property of the Owner when delivered at the point to which shipment is to be made. The Owner may, however, reject any materials and/or warranties of the Contractor and manufacturers. Recognition and subsequent rejection of any defective materials may occur either before or after incorporation of such materials into the work, provided such rejection is made within one (1) year of date of delivery of the materials. Upon any such rejection, the Contractor shall replace the rejected materials with materials complying with the Specification for Materials and warranties at the substation site. The Owner shall return the rejected materials F.O.B. truck at the same destination. In the event of the failure of the Contractor to so replace rejected materials, the Owner shall make such replacement and the cost and expense thereof shall be paid by the recoverable from the Contractor.

4.0 Storage of Materials

The Contractor will be responsible for transporting, unloading and storage at the project site. All driveways and public roadways must be kept clear. No parking, storage or staging of materials shall be performed in a driveway or roadway, causing said roadway, impassable any time. Parking, storage and staging of materials shall be performed only in approved lay down areas.

5.0 Protection to Persons and Property

The Contractor shall at all times take all reasonable precautions for the safety of employees on the work and of the public, and shall comply with all applicable provisions of Federal, State, and Municipal safety laws and building and construction codes, as well as the safety rules and regulations of the Owner. All machinery and equipment and other physical hazards shall be guarded in accordance with the "Manual of Accident Prevention in Construction" of the Associated General Contractors of America unless such instructions are incompatible with Federal, State, or Municipal laws or regulations.

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

5.1 The Contractor shall so conduct the substation construction as to cause the least possible obstruction of public highways or streets.

5.2 The Contractor shall provide and maintain all such guard lights and other protection for the public as may be required by applicable statutes, ordinances, and regulations or by local conditions.

5.3 The Contractor shall do all things necessary or expedient to protect properly any and all parallel, converging, and intersecting lines, joint line poles, highways, railways and any and all property of others from damage, and in the event that any such parallel, converging and intersecting lines, joint line poles, highways, railways or other property are damaged in the course of the construction of the line, the Contractor shall at his own expense immediately restore any or all of such damaged property to as good a state as before such damage occurred.

5.4 The Contractor shall enter and exit the right-of-way at those locations specified by Owner or the Engineer.

It shall be the responsibility of the Contractor to maintain safe and unobstructed control of traffic along all state roads, highways, and all other streets within the project area. The Contractor shall obtain sufficient and suitable traffic cones, barriers, warning signs, and other devices necessary to maintain a safe work environment for crews and the general public. Traffic control must be provided for in accordance with the Manual of Uniform Traffic Control Devices (MUTCD), the North Carolina Department of Transportation (N.C.D.O.T.) Supplement to the MUTCD, all local ordinances, and as approved by local and state authorities.

5.5 All ditches and access ways disturbed shall be returned to their pre-existing condition at the end of construction.

5.6 Any and all excess earth, rock, debris, underbrush, and other useless material shall be removed by the Contractor from the site of the work as rapidly as practicable as the work progresses.

5.7 Before beginning work in or around any areas where underground facilities are known to exist, the Contractor shall locate all such facilities including water, sewer, gas, telephone and electrical lines.

5.8 Upon violation by the Contractor of any provisions of this section, after written notice of such violation given to the Contractor by the Owner, the Contractor shall immediately correct such violation. Upon failure of the Contractor to do so, the Owner may correct such violation at the Contractor's expense.

5.9 The Contractor shall submit to the Owner monthly reports in duplicate of all accidents, giving such data as may be prescribed by the Owner.

6.0 Supervision and Inspection

6.1 The Contractor shall cause the construction work to receive constant supervision by a competent foreman who shall be present at all times during working hours where construction is being carried on. The Contractor shall also employ, in connection with the construction of the substation capable, experienced, and reliable foremen and such skilled

workmen as may be required for the various classes of work to be performed. Directions and instructions given to the Superintendent by the Owner shall be binding upon the Contractor.

6.2 The Owner reserves the right to require the removal from the project of any employee of the Contractor if, in the judgment of the Owner, such removal shall be necessary in order to protect the interest of the Owner. The Owner shall have the right to require the Contractor to increase the number of his employees and to increase or change the amount or kind of tools and equipment if at any time the progress of the work shall be unsatisfactory to the Owner; the failure of the Owner to give any such directions shall not relieve the Contractor of his obligations to complete the work within the time and in the manner specified in this Proposal.

6.3 The manner of performance of the work, and all equipment used therein, shall be subject to the inspection, tests and approval of the Owner. The Contractor shall have an authorized agent accompany the Owner when final inspection is made and, if requested by the Owner, when any other inspection is made.

6.4 In the event that the Owner shall determine that the construction contains or may contain numerous defects, it shall be the duty of the Contractor, if requested by the Owner to have an inspection made by the Engineer for the purpose of determining the exact nature, extent, and location of such defects.

7.0 Temporary Construction

All temporary construction required to accomplish the work covered in these Specifications shall be the sole responsibility of the Contractor. The Contractor shall furnish all labor and materials necessary for temporary construction including the installation and removal of poles, insulators, hardware, guys, anchors, etc. All materials used for temporary construction shall be removed from the site as soon as practicable and the site restored to as good a state as before such construction. All temporary materials supplied by the Contractor will remain the property of the Contractor. All temporary construction shall be performed and shall adhere to the same safety and code requirements as the proposed work and shall be covered by all requirements of these Plans, Specifications, and Contract Documents.

No extra pay item will be issued for temporary construction, or for subsequent removal of same.

8.0 Normal Work Week

8.1 The Contractor shall state in the Proposal his normal work week for the project.

8.2 The Contractor will not be paid for inclement weather days, or for travel time to and from the job site, unless expressly requested by the Contractor as a written stipulation to his original Proposal.

9.0 Job-Site Obligations

9.1 Except as otherwise provided in the Contract, necessary sanitary conveniences for use by Contractor's employees and Subcontractors at the Jobsite shall be furnished and maintained by Contractor in such manner and at such locations as shall be approved by the Company Representative and their use shall be strictly enforced.

9.2 Contractor shall, at all times, keep its work areas in a neat, clean, and safe condition. Contractor shall be responsible for continuous clean up and removal of its trash, debris, waste materials and scrap and disposal of same off the Jobsite. Upon completion of any portion of the Work, Contractor shall immediately remove all of its equipment, construction plant, temporary structures and surplus materials not to be used at or near the same location during later stages of the Work. Upon completion of the Work and before final payment is made, Contractor shall, at its expense, satisfactorily dispose of all plant, buildings, rubbish, unused materials, and other equipment and materials belonging to it or used in the performance of the Work, including return to Owner's warehouse or designated laydown area(s), at Owner's option of any salvageable materials for which Owner has reimbursed Contractor or that has

been supplied by Owner for incorporation into the Work but not used; and Contractor shall leave the premises in a neat, clean and safe condition acceptable to the Company Representative. In the event of Contractor's failure to comply with the foregoing, the same may be accomplished by Owner at Contractor's expense.

9.3 Owner reserves the right to authorize its agents or designees to enter the Jobsite as it may elect for the purpose of inspecting the Work, or constructing or installing such collateral work as it may desire, or testing, boring or surveying, or any other purpose.

9.4 Contractor understands and agrees that duly authorized representatives of government agencies having appropriate jurisdiction may enter the Jobsite at any time and from time to time.

9.5 If any Work or part thereof shall be covered contrary to the requirements of the Contract or the request of the Owner or Engineer, it must, if required by the Company Representative, be uncovered for observation and inspection and covered again at Contractor's sole expense.

9.6 If any other Work that the Company Representative has not specifically requested to observe and inspect prior to being covered has been covered, the Owner or Engineer may request to see such Work or part thereof and it shall be uncovered by Contractor. If such Work or part thereof is found to be in accordance with the Contract, the cost of uncovering and covering again shall, by appropriate Change Form, be charged to Owner. If such Work or part thereof fails to meet the requirements of the Contract, Contractor shall pay all costs of uncovering, correcting, and covering again and any additional costs resulting there from.

9.7 The Contractor shall conduct daily and weekly on-site safety meetings at the beginning of each work period. These meetings should not preclude the Contractor from conducting tailgate safety meetings before each new work period, after break, different work assignments, etc. as determined by OSHA and other applicable safety laws and regulations.

9.8 All Contractor personnel and any subcontractor personnel shall have a safety briefing by the Contractor prior to entering the energized substation area.

9.9 The Contractor shall facilitate a formal safety program for all individuals entering the site.

9.10 The Contractor shall provide the Owner a copy of the Contractor's Safety Manual, outlining policies, procedures, documentation and training. The Owner will provide the Contractor with a copy of the Owner's Safety Manual. The Contractor shall perform the work using the more stringent of the two policies.

10.0 Covid-19

As North Carolina and the nation continues to deal with the COVID 19 pandemic, we must all take necessary steps to ensure the health and safety of employees, coworkers, family, friends, associates and people that we come in contact with on a daily basis. At PWC we implemented measures including requiring our employees to conduct temperature and wellness checks, wear a face covering or mask, whenever possible, maintain proper social distancing (minimum or 6 feet) and take other actions such as washing their hands, using approved sanitizer and wiping down surfaces, especially commonly shared equipment or tools. This applies to employees working in our facilities, working in public or at field sites. For firms who are under contract with PWC or working under Contract, those firms are expected to comply with all OSHA/EPA guidelines, CDC recommendations including any applicable North Carolina Executive Orders regarding the performance of work under COVID 19 conditions. Examples of such guidance can be found at the following:

OSHA COVID-19 Overview

https://www.osha.gov/SLTC/covid-19/

OSHA COVID-19 – Control and Prevention / Construction Work

https://www.osha.gov/SLTC/covid-

19/construction.html#:~:text=Keep%20in%2Dperson%20meetings%20(including,Fill%20hand%20sanitizer%20dis

pensers%20regularly.

https://www.osha.gov/Publications/OSHA4000.pdf

North Carolina COVID-19 Executive Orders

https://www.nc.gov/covid-19/covid-19-executive-orders

Center for Disease Control

https://www.cdc.gov/coronavirus/2019-ncov/index.html

Implementing Safety Practices for Critical Infrastructure Workers

https://www.cdc.gov/coronavirus/2019-ncov/community/critical-workers/implementing-safety-practices.html

Essential Staff- Do's & Dont's

https://www.cdc.gov/coronavirus/2019-ncov/downloads/Essential-Critical-Workers_Dos-and-Donts.pdf

NC Licensing Board for General Contractors

https://www.nclbgc.org/2020/07/02/board-buzz-summer/

NC Association of General Contractors

https://www.cagc.org/CAGC/SafetyHR/CAGC/Safety/SafelyHomeInitiative.aspx?hkey=e3439388-0c36-4755-

91bd-4c8fc6d22a41

NC Department of Health and Human Services

https://covid19.ncdhhs.gov/

Cumberland County Health Department

https://www.co.cumberland.nc.us/departments/public-health-group/public-health

Department of Homeland Security

https://www.ready.gov/pandemic

Cape Fear Valley- What to do if you have COVID symptoms

https://www.youtube.com/watch?time_continue=1&v=tD0D7Apa_vw&feature=emb_logo

FAYPWC COVID Response

https://www.faypwc.com/covid-19-update/

Small Business Administration

https://www.sba.gov/page/coronavirus-covid-19-small-business-guidance-loan-resources

As an additional step to ensure the health and safety of contractor employees and PWC employees, should a contractor's employee test positive for COVID 19 the contractor must immediately inform the PWC project manager/supervisor or their primary point of contact at PWC and the employee should be performing work at PWC facilities or field sites until medically cleared. This is necessary so PWC can inform our employees, conduct or own method of contact tracing for our employees and take any measures necessary such as quarantining PWC employees who may have been in contact with the individual who tested positive.

These actions are necessary to ensure the health and safety of all and to ensure that contract performance can be achieved under the conditions of this pandemic.

Contractor must provide a plan with their proposal that describes their plan for working under COVID-19 conditions. The plan should address the Contractors approach to protect their employees, PWC employees, along with any other Contractor's working on PWC's locations. This may include the Contractor's approach towards employee use of PPE, such as face masks, sanitizing commonly shared tools or equipment, practicing social distancing as work conditions permit, and working within close proximity of others. The plan may also address any other actions that the Contractor will be taking, such as conducting daily temperature checks, conducting symptom checks and trackers, and any other actions the Contractor deems appropriate to protect the health and safety of their employees, PWC employees, and any other Contractor's working on PWC's locations.

DEFINITIONS

Whenever the following terms or pronoun in place of them are used in these "Instructions to Bidders", "Form of Proposal", "Technical Specifications", "Contract", bond, etc., the intent and meaning shall be interpreted as follows:

Owner	Public Works Commission Fayetteville, North Carolina
CEO/General Manager	Elaina Ball, or his authorized assistant
Principle Engineer	David Deschamps; or his authorized assistant
Purchasing Manager	Trent Ensley; or his authorized assistant
Engineer	Booth & Associates, LLC
Observer	An authorized representative of the Owner assigned to make any or all necessary observations of work performed and equipment and/or apparatus furnished by the Bidder
Bidder/Materialman/Contractor	Any individual, firm, or corporation submitting a Proposal for the work contemplated, acting directly or through a duly authorized representative; or party of the second part of the Contract, acting directly or through a duly authorized representative
Subcontractor	An individual, firm, or corporation who contracts with the Bidder to perform part of the latter's work
Surety	The body, corporate or individual, approved by the Owner, which is bound with and for the Bidder who is primarily liable and which engages to be responsible for his acceptable performance of the work for which he has contracted
Form of Proposal, Proposal	The approved, prepared form on which the Bidder is to submit or has submitted his Proposal for the work contemplated
Bid Security	To all bids there shall be attached cash, cashier's check, or certified check from the Bidder upon a bank or trust company insured by the Federal Deposit Insurance Corporation or the Savings Associates Insurance Fund, or in lieu thereof, a Bid Bond
Plans, Drawings	All Drawings or reproductions of Drawings pertaining to the construction under the Contract
Technical Specifications	The directions, provisions, and requirements contained herein pertaining to the method and manner of performing the work or to the quantities and qualities of materials to be furnished under the Contract

Contract	The agreement covering the furnishing of equipment and/or apparatus and the performance of the work. The Contract shall include the "Instructions to Bidders", "General Conditions", "Form of Proposal", "Plans", "Technical Specifications", and Acknowledgments
Performance Bond (required)	The approved form of security to be approved by the Owner furnished by the Bidder and his Surety as a guarantee of good faith on the part of the Bidder to accept the work in accordance with the terms of the Specifications and Contract
Payment Bond (required)	The approved form of security to be approved by the Owner furnished by the Bidder and his Surety as a guarantee for payment of all Subcontractors on the part of the Bidder in acceptance of the work in accordance with the terms of the Specifications and Contract
Work	The performance of the project covered by the Specifications or the furnishing of labor, machinery, equipment, tools, or any other article or item being purchased by the Owner
Emergency	A temporary unforeseen occurrence or combination of circumstances which endangers life and property and calls for immediate action or remedy
Work at Site of Project	Work to be performed, including work normally done on the location of the project
Bid Documents	Include all sections of the Request for Bids, Form of Proposal, Technical Specifications and Appendices, Addendum/Clarifications/Bulletins, and Drawings

The subheadings in these Specifications are intended for convenience or reference only and shall not be considered as having any bearing on the interpretations thereof.

Form of Proposal

BUTLER WARNER GENERATION PLANT BESS PROJECT

BID SCHEDULE NO. 1 – Base Bid – 1.44 MW / 5.76 MWh BESS

Description	Quantity	Unit Price
Battery Energy Storage System (BESS), 1.44 MW / 5.76 MWh (±10% tolerance), 480 VAC, 5 year (minimum) Product & Performance Warranty, includes inverters, batteries and enclosures, coordinating site and SCADA controls and all battery thermal management, all as per Specifications.	1	$_____
Delivery Charge	1	$_____
Field Service Support – Construction / Installation (Labor + Expenses / Lump Sum)	1	$_____
Field Service Support –Start Up, Commission & Training (Labor + Expenses / Lump Sum)	1	$_____
BASE BID:		**$_____**
Alternate Warranty Option (10 Year)	1	$_____
BASE BID + Extended 10 Year Warranty:		**$_____**

Battery Cell Manufacturer _____ Type (Origin) _____

Inverter Manufacturer _____ Type (Origin) _____

Packager (Container) _____ Type (Origin) _____

System Requirements	Project References - Recent Units of Similar Design
Area Footprint:	
Station Power Req's:	
Other Req's:	

	Delivery (Days)*		Duration (Days)
Approval Drawings	_____	Construction / Install	_____
Final Drawings**	_____	Start Up / Commission	_____
Delivery of Material**	_____		

* Number of consecutive calendar days after receipt of written order from the Owner.

** Allow two (2) weeks for receipt and return of Approval Drawings.

ALTERNATE BID SCHEDULE NO. 2 – Base Bid – 1.5 MW / 6 MWh BESS

Description	Quantity	Unit Price
Battery Energy Storage System (BESS), 1.5 MW / 6 MWh (±10% tolerance), 480 VAC, 5 year (minimum) Product & Performance Warranty, includes inverters, batteries and enclosures, coordinating site and SCADA controls and all battery thermal management, all as per Specifications.	1	$_____
Delivery Charge	1	$_____
Field Service Support – Construction / Installation (Labor + Expenses / Lump Sum)	1	$_____
Field Service Support –Start Up, Commission & Training (Labor + Expenses / Lump Sum)	1	$_____
BASE BID:		**$_____**
Alternate Warranty Option (10 Year)	1	$_____
BASE BID + Extended 10 Year Warranty:		**$_____**

Battery Cell Manufacturer _____ Type (Origin) _____

Inverter Manufacturer _____ Type (Origin) _____

Packager (Container) _____ Type (Origin) _____

System Requirements	Project References - Recent Units of Similar Design
Area Footprint:	
Station Power Req's:	
Other Req's:	

	Delivery (Days)*		Duration (Days)
Approval Drawings	_____	Construction / Install	_____
Final Drawings**	_____	Start Up / Commission	_____
Delivery of Material**	_____		

* Number of consecutive calendar days after receipt of written order from the Owner.

** Allow two (2) weeks for receipt and return of Approval Drawings.

ALTERNATE BID SCHEDULE NO. 3 – Base Bid – 1.75 MW / 7 MWh BESS

Description	Quantity	Unit Price
Battery Energy Storage System (BESS), 1.75 MW / 7 MWh (±10% tolerance), 480 VAC, 5 year (minimum) Product & Performance Warranty, includes inverters, batteries and enclosures, coordinating site and SCADA controls and all battery thermal management, all as per Specifications.	1	$_____
Delivery Charge	1	$_____
Field Service Support – Construction / Installation (Labor + Expenses / Lump Sum)	1	$_____
Field Service Support –Start Up, Commission & Training (Labor + Expenses / Lump Sum)	1	$_____
BASE BID:		**$**_____
Alternate Warranty Option (10 Year)	1	$_____
BASE BID + Extended 10 Year Warranty:		**$**_____

Battery Cell Manufacturer _____ Type (Origin) _____

Inverter Manufacturer _____ Type (Origin) _____

Packager (Container) _____ Type (Origin) _____

System Requirements	Project References - Recent Units of Similar Design
Area Footprint:	
Station Power Req's:	
Other Req's:	

	Delivery (Days)*		Duration (Days)
Approval Drawings	_____	Construction / Install	_____
Final Drawings**	_____	Start Up / Commission	_____
Delivery of Material**	_____		

* Number of consecutive calendar days after receipt of written order from the Owner.

** Allow two (2) weeks for receipt and return of Approval Drawings.

BID SCHEDULE NO. 4 – Field Service Engineering / O&M

Per Day Rate (including expenses) for
field service engineering for additional days $_____/Day

Per Year Rate (including expenses) for
field Operation and Maintenance (O&M) Services $_____/Year

1. The prices of Materials set forth herein do not include any sums which are or may be payable by the Bidder on account of North Carolina sales tax upon the sale, purchase, or use of the Materials hereunder. The amount thereof shall be added to the purchase price and paid by the Owner after the Bidder has ascertained the actual sales tax to be included.

2. The Materials will conform to the "Specifications for Battery Energy Storage System" attached hereto and made a part hereof.

3. The Owner may accept any Schedule or portion thereof.

4. Price Policy: The prices quoted in the Proposal shall be firm unless otherwise stated.

5. The prices quoted shall include delivery of the materials and equipment by open-top truck F.O.B. point of delivery, Fayetteville, North Carolina, assuming unloading by the Owner.

   The time for delivery shall be extended for the period of any reasonable delay due exclusively to causes beyond the control and without fault of the Bidder, including acts of God, fires, floods, strikes, and delays in transportation.

   Delivery of all items of equipment to the Owner's designated delivery point shall be made to permit unloading between the hours of 9:00 a.m. and 3:00 p.m., Monday through Friday, holidays excluded.

6. Receipt of Approval Drawings by the Bidder constitutes authorization for manufacture predicated upon the Drawings and corrections found thereon. After the return of Approval Drawings, release for shipment is to be granted by either the Owner or its Engineer based upon the manufacturer's compliance with the following:

   (1) Notification of tests so the Owner may have a representative present to witness the tests.

   (2) Furnishing of the requested number of copies of the Final Drawings as called for in the Specifications.

   (3) Coordination of manufacturing and delivery with the Owner's construction schedule as may be noted in these Specifications.

   (4) Thirty days' (30) notification of tentative shipping schedule and forty-eight (48) hours' notification prior to all deliveries.

7. Title to the materials and equipment shall pass to the Owner upon delivery to the point specified herein.

8. This Proposal is made pursuant to the provisions of the Notice and Instructions to Bidders and the Specifications, and the Bidder agrees to the terms and conditions thereof.

9. The Bidder warrants the accuracy of all statements contained in the Bidder's qualifications, if any shall be submitted, and agrees that the Owner shall rely upon such accuracy as a condition of the Contract in the event that this Proposal is accepted.

10. The Bidder warrants that the Materials will conform to the performance data and guarantees which are attached hereto and by this reference made a part hereof.

11. A Form of Exceptions to the Specifications, prepared in accordance with the Instructions to Bidders, is attached hereto.

12. Non-Collusive Bidding Certification - By the submission of this bid, the Bidder certifies that:

(a) The bid has been arrived at by the Bidder independently and has been submitted without collusion with any other Bidder of materials, supplies, or equipment of the type described in the Notice to Prospective Bidders or the Specifications.

(b) The contents of the bid have not been communicated by the Bidder or, to his best knowledge and belief, by any of his employees or agents to any person not an employee or agent of the Bidder or his Surety on any Bond furnished herewith and will not be communicated to any person prior to the official opening of the bid.

13. The undersigned further agrees that in case of failure on his part to accept said Contract within ten (10) consecutive calendar days after written notice has been given of the award of the Contract, the check, cash, or Bid Bond accompanying this bid and the monies payable thereon, shall be paid into the funds of the Owner account set aside for this project as liquidated damages for such failure; otherwise, the check, cash, or Bid Bond accompanying the Proposal shall be returned to the Undersigned.

14. If, in submitting this Proposal, the Bidder has made any change in the Bidder's Proposal, the Bidder understands that the Owner may evaluate the effect of such change as it sees fit or may exclude the Proposal from consideration in determining the award of the Contract.

15. The prices of the materials and equipment set forth herein shall include the cost of delivery to the site at the Bidder's risk. The date of delivery shall be in compliance with section 6.1 of the technical specifications.

Respectfully submitted this _____ day of _____, 20__.

_____
Name of Firm

By: _____

_____
Title

Address of Bidder: _____

_____

_____

_____

_____

Email Address of Bidder: _____

_____

_____

_____

List of any Subcontractors with address: _____

_____

_____

FORM OF EXCEPTIONS

BIDDER: _____

OWNER: PUBLIC WORKS COMMISSION OF THE CITY OF FAYETTEVILLE
FAYETTEVILLE, NORTH CAROLINA

PROJECT DESCRIPTION BUTLER WARNER GENERATION PLANT BESS PROJECT

Project: _____

INSTRUCTIONS: The following is a list of exceptions to the Bidding Documents and/or Technical Specifications pertaining to the furnishing of the subject materials. Bidders shall identify each exception by Specification page and paragraph number on this form. The omission of exception implies complete compliance with Plans and Specifications.

BID DOCUMENT/ SPECIFICATION PAGE NO. AND PARAGRAPH	**EXCEPTION/VARIATION**

NORTH CAROLINA BID BOND

KNOW ALL MEN BY THESE PRESENT, THAT WE _____

_____

as Principal, and _____

as Surety, who is duly licensed to act as Surety in North Carolina, are held and firmly bound unto Public Works Commission of the City of Fayetteville, Fayetteville, North Carolina, as Obligee, in the penal sum of _____

_____ DOLLARS ($_____) (5% Bid Bond), lawful money of the United States of America, for the payment of which, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these present.

SIGNED, Sealed and dated this _____ day of _____, 20__.

WHEREAS, the said Principal is herewith submitting Proposals for

BUTLER WARNER GENERATION PLANT BESS PROJECT

and the Principal desires to file this Bid Bond in lieu of making the cash deposit as required by GS 143-129 amended in Chapter 1104 of the Public Laws of 1951;

NOW, THEREFORE, THE CONDITION OF THE ABOVE OBLIGATION is such that if the Principal shall be awarded the Contract for which the bid is submitted and shall accept the Contract within ten (10) days after the award of same to the Principal, then this obligation shall be null and void; but if the Principal fails to so accept such Contract as required by GS 143-129, as amended by Chapter 1104 of the Public Laws of 1951, the Surety shall, upon demand, forthwith pay to the Obligee the amount set forth in the first paragraph hereof, and upon failure to forthwith make such payment, the Surety shall pay the Obligee an amount equal to double the amount of this Bid Bond as set forth in the first paragraph herein. Power of Attorney from the Surety to its Attorney-in-Fact is attached hereto.

_____

Principal

By _____(SEAL)

_____

Corporate Surety

By _____(SEAL)

FAYETTEVILLE PUBLIC WORKS COMMISSION
FAYETTEVILLE, NORTH CAROLINA

Butler Warner Generation Plant BESS Project

BID AND CONSTRUCTION SCHEDULE

DATE	ITEM
December 16, 2020	Public Advertisement
January 8, 2021	Deadline for Questions (5pm EST)
January 15, 2021	Deadline for Addendum
January 26, 2021	Bid Opening/Bid Deadline (2pm EST)
TBD	Award of Contract (By the Commission)
TBD	Pre-Construction Conference (Location TBD)
TBD	BESS Delivery to Site / Begin Construction
TBD	Commissioning Complete
TBD	On-site Training of PWC Staff / Fire Authorities

NOTICE OF AWARD

TO: _____
_____
_____

PROJECT DESCRIPTION: **INSTALLATION OF BESS AT BUTLER WARNER GENERATION PLANT**

The OWNER has considered the BID submitted by you for the above described work in response to its Advertisement for Bids dated _____ and Instructions to Bidders.

You are hereby notified that your BID has been accepted for items in the amount of $_____.

You are required by the Instructions to Bidders to execute the Agreement and furnish the required Performance Bond, Payment Bond, and Certificates of Insurance within ten (10) calendar days from the date of this NOTICE to you.

If you fail to execute said Agreement and to furnish said Bonds within ten (10) days from the date of this Notice, said Owner will be entitled to consider all your rights arising out of the OWNER's acceptance of your BID as abandoned and as a forfeiture of your Bid Bond. The Owner will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this _____day of _____, 20__.

OWNER: **PUBLIC WORKS COMMISSION OF THE CITY OF FAYETTEVILLE**

BY:_____
Trent Ensley
Purchasing Manager

ACCEPTANCE OF AWARD

INSTALLATION OF BESS AT BUTLER WARNER GENERATION PLANT

Receipt of the preceding NOTICE OF AWARD is hereby acknowledged this the _____ day of _____, 20__.

CONTRACTOR

By:_____

Title:_____

CONTRACT

THIS CONTRACT, made this _____day of _____,20__, by **CONTRACTOR,** hereinafter called CONTRACTOR, and the **City of Fayetteville, North Carolina, by and through the Fayetteville Public Works Commission,** hereinafter called COMMISSION.

WITNESSETH

THAT WHEREAS, a Contract for **BUTLER WARNER GENERATION PLANT BESS PROJECT** has recently been awarded to Contractor by Commission, at and for a sum equal to the aggregate cost of the work to be done and labor, materials, equipment, apparatus, and supplies furnished at the prices and rates respectively named therefore in the Bid Form in the amount of **$**_____attached hereto:

AND WHEREAS, it was provided in said award that a formal Contract would be executed by and between Contractor and Commission, evidencing the terms of said award, and that Contractor would commence the work to be performed under this agreement on a date to be specified in a written order by the Commission and will fully complete all work thereunder within XX consecutive calendar days after the start date specified on the Notice to Proceed;

NOW, THEREFORE, Contractor doth hereby covenant and agree with Commission that it will well and faithfully perform and execute such work and furnish all labor, materials, equipment, apparatus and supplies, in accordance with the Plans, at and for a sum equal to the aggregate cost of the work done and labor, materials, equipment, apparatus and supplies furnished at the prices and rates respectively named therefore in the Bid Form attached hereto, and will well and faithfully comply with and perform each and every obligation imposed upon it by said Plans and Specifications and terms of said award.

Contractor shall promptly make payments to all persons supplying materials in the prosecution of the work, and to all laborers and others employed thereon.

Contractor shall be responsible for all damages to the property of the City of Fayetteville, North Carolina, that may be consequent upon the normal procedure of its work or that may be caused by or result from the negligence of Contractor, its employees or agents, during the progress of or connected with the prosecution of the work, whether within the limits of the work or elsewhere. Contractor must restore all property so injured to a condition as good as it was when Contractor entered upon the work.

Contractor shall furthermore be responsible for and required to make good at its expense any and all damages of whatever nature to persons or property, arising during the period of the Contract, caused by carelessness, neglect or workmen. Contractor shall also indemnify and save harmless Commission and The City of Fayetteville, North Carolina, and the Officers and agents thereof from all claims, suits, and proceedings of every name and description which may be brought against Commission or The City of Fayetteville, North Carolina, or the Officers and agents thereof, for or on account of any injuries or damages to persons or property received or sustained by any person or persons, firm, or corporation, or by or in consequence of any materials used in said work or by or on account of any improper

material or workmanship in its construction, or by or on account of any accident, or of any other act of omission of Contractor, its agents, employees, servants or workmen.

It is agreed and understood that the Advertisement for Bids, Definitions, Instructions to Bidders, General Conditions, Supplementary Conditions, General Specifications, Material Specifications, Detail Specifications, the accepted Bid Form, and the enumerated Addenda and drawings are parts and parcels of this Contract, to the same as it incorporated herein in full.

It is further mutually agreed that, if, at any time after the execution of this agreement and the Surety Bond hereto attached for its faithful performance and payment, Commission shall deem the Surety or Sureties upon such Bond to be unsatisfactory, or if for any reason, such Bond ceases to be adequate to cover the performance and/or payment of the work, Contractor shall, at its expense, within five (5) days after the receipt of notice from Commission so to do, furnish an additional Bond or Bonds in such form and amount, and with such Surety or Sureties as shall be satisfactory to Commission. In such event no further payment to Contractor shall be deemed to be due under this agreement until new or additional security for the faithful performance and payment of the work shall be furnished in manner and form satisfactory to Commission.

And Commission doth hereby covenant and agree with Contractor that it will pay to Contractor, when due and payable under the terms of said Specifications and said award, the above mentioned sum, and that it will well and faithfully comply with and perform each and every obligation imposed upon it by said Specifications and the terms of said award.

It is further agreed that the Contractor shall, upon each pay request under this Contract, furnish to Commission invoices or copies of invoices for all materials purchased for said work within pay request period, and such invoices shall state the amount of North Carolina Sales Tax paid for said materials; and Contractor shall also furnish Commission an affidavit certifying the total costs of materials purchased for all work performed within pay request period under this Contract and the total amount of North Carolina Sales Tax paid for said materials.

Contractor hereby acknowledges that "E-Verify" is the federal E-Verify program operated by the US Department of Homeland Security and other federal agencies which is used to verify the work authorization of newly hired employees pursuant to federal law and in accordance with Article 2, Chapter 64 of the North Carolina General Statutes. Contractor further acknowledges that all employers, as defined by Article 2, Chapter 64 of the North Carolina General Statutes, must use E-Verify and after hiring an employee to work in the United States, shall verify the work authorization of the employee through E-Verify in accordance with G.S. 64-26(a). Contractor hereby pledges, attests and warrants through execution of this Agreement that Contractor complies with the requirements of Article 2, Chapter 64 of the North Carolina General Statutes and further pledges, attests and warrants that any subcontractors currently employed by or subsequently hired by Contractor shall comply with any and all E-Verify requirements. Failure to comply with the above requirements shall be considered a breach of this Agreement. Contractor hereby further acknowledges that the execution and delivery of this Agreement constitutes Contractor's certification to Commission and to the North Carolina State Treasurer that, as of the date of the Effective Date, Contractor is not listed on (a) the Final Divestment List created and maintained by the North Carolina Department of State Treasurer pursuant to the Iran Divestment Act of 2015, Chapter 147, Article 6E of the General Statutes of North Carolina (the "Iran Divestment Act"); or (b) the list of companies that the North Carolina State Treasurer determines to be engaged in a boycott of

Israel in accordance with Article 6G of Chapter 147 of the General Statutes of North Carolina. Contractor represents and warrants to Commission that Contractor, and all persons and entities owning (directly or indirectly) an ownership interest in it: (i) are not, and will not become, a person or entity with whom a party is restricted from doing business with under regulations of the Office of Foreign Asset Control ("OFAC") of the Department of the Treasury (including, but not limited to, those named on OFAC's Specially Designated and Blocked Persons list) or under any statute, executive order (including, but not limited to, the September 24, 2001, Executive Order 13224 Blocking Property and Prohibiting Transactions with Persons Who Commit, Threaten to Commit, or Support Terrorism), or other governmental action; and (ii) are not knowingly engaged in, and will not knowingly engage in, any dealings or transactions or be otherwise associated with such persons or entities described in clause (i) above. Contractor also shall at all times during the term of this Agreement comply with Executive Order 11246, including but not limited to the Equal Opportunity Clause requirements set forth in 41 C.F.R. § 60-1.4. Contractor shall abide by the requirements of 41 CFR 60–300.5(a) and 60–741.5(a). These regulations prohibit discrimination against qualified individuals on the basis of protected veteran status or disability, and require affirmative action by covered prime contractors and subcontractors to employ and advance in employment qualified protected veterans and individuals with disabilities. Contractor shall conduct all activities in regard to this Agreement without respect to the race, color, religion, sex, national origin, handicap or familial status of any party or prospective party to the agreement. For the purposes of this Agreement, the term "familial status" shall be defined as it is in G.S. 41A-3(1b).

Whenever used herein, the singular shall include the plural, the plural singular, and the use of any genders shall be applicable to all genders as the context may require.

IN TESTIMONY WHEREOF, Contractor and Commission have duly signed and sealed this Contract.

(Corporate Seal)

CONTRACTOR

(SEAL)

BY:_____

ATTEST:

TITLE:_____

_____

Secretary

CITY OF FAYETTEVILLE, by and through Fayetteville Public Works Commission

ATTEST:

By:_____

City Manager

_____

Clerk of City Council

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

_____
Chief Financial Officer

This is to certify that I have examined the attached contract documents, that after such examination I am of the opinion that such documents conform to the laws of the State of North Carolina, that the execution of the contract and the contract bonds by **CONTRACTOR** are in due and proper form and that the foregoing agreements constitute valid and binding obligations on such parties.

_____
Attorney for the City of Fayetteville, NC

PERFORMANCE BOND

Instructions to Bidders, 6.0 Performance and Payment Bonds

Date of Execution:	
Name of Principal: (Contractor)	
Name and Address of Surety:	
Name of Contracting Body:	PUBLIC WORKS COMMISSION OF THE CITY OF FAYETTEVILLE FAYETTEVILLE, NORTH CAROLINA
Amount of Bond:	
Project:	INSTALLATION OF BESS AT BUTLER WARNER GENERATION PLANT

KNOW ALL MEN BY THESE PRESENTS, that we, the Principal and Surety above named, are held and firmly bound unto the above named Contracting Body, hereinafter called the Contracting Body, in the penal sum of the amount stated above the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal entered into a certain Contract with the Contracting Body, identified as shown above and hereto attached.

NOW, THEREFORE, if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said Contract during the original term of said Contract and any extensions there of that may be granted by the Contracting Body, with or without notice to the Surety, and during the life of any guaranty required under the Contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said Contract that may hereafter be made, notice of which modifications to the Surety being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue.

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

Executed in __5__ counterparts

Witness:

CONTRACTOR:

(Trade or Corporate Name)

(Proprietorship or Partnership)

By:

ATTEST:

Title:

(Owner, Partner, or Corporate President or V-President, Only)

By:

Title:

(Corporate Secretary or Assistant Secretary, Only

(CORPORATE SEAL)

SURETY COMPANY:

Witness:

By:

Title:

(Attorney in Fact)

Countersigned:

N.C. Licensed Resident Agent

(SURETY CORPORATE SEAL)

(Name and Address – Surety Agent)

Surety Company Name and N.C. Regional or Branch Office Address

PAYMENT BOND

Instructions to Bidders, 6.0 Performance and Payment Bonds

Date of Execution:	
Name of Principal: (Contractor)	
Name and Address of Surety:	
Name of Contracting Body:	PUBLIC WORKS COMMISSION OF THE CITY OF FAYETTEVILLE FAYETTEVILLE, NORTH CAROLINA
Amount of Bond:	
Project:	INSTALLATION OF THE BESS AT BUTLER WARNER GENERATION PLANT

KNOW ALL MEN BY THESE PRESENTS, that we, the Principal and Surety above named, are held and firmly bound unto the above named Contracting Body, hereinafter called the Contracting Body, in the penal sum of the amount stated above the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal entered into a certain Contract with the Contracting Body, identified as shown above and hereto attached.

NOW, THEREFORE, if the Principal shall promptly make payment to all persons supplying labor and material in the prosecution of the work provided for in said Contract, and any and all duly authorized modifications of said Contract that may hereafter be made, notice of which modifications to the Surety being hereby waived, then this obligation to be void; otherwise to remain in full force and virtue.

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

Executed in __5__ counterparts

Witness:

CONTRACTOR:

(Trade or Corporate Name)

(Proprietorship or Partnership)

By:

ATTEST:

Title:

(Owner, Partner, or Corporate President or V-President, Only)

By:

Title:

(Corporate Secretary or Assistant Secretary, Only

(CORPORATE SEAL)

SURETY COMPANY:

Witness:

By:

Title:

(Attorney in Fact)

Countersigned:

N.C. Licensed Resident Agent

(SURETY CORPORATE SEAL)

(Name and Address – Surety Agent)

Surety Company Name and N.C. Regional or Branch Office Address

NOTICE TO PROCEED

TO: _____ **DATE:** _____

PROJECT: INSTALLATION OF BESS AT BUTLER WARNER GENERATION PLANT

_____

You are hereby notified to commence work in accordance with the Contract dated _____, 20__, on or before _____, 20__, and you are to complete the WORK within _____ consecutive calendar days thereafter. The date of completion of all work is therefore _____, 20__.

OWNER: PUBLIC WORKS COMMISSION OF THE CITY OF FAYETTEVILLE

BY: _____
Trent Ensley
Purchasing Manager

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED

is hereby acknowledged this the _____day

of _____, 20__.

CONTRACTOR

BY: _____

TITLE: _____

FAYETTEVILLE PUBLIC WORKS COMMISSION
FAYETTEVILLE, NORTH CAROLINA

BATTERY ENERGY STORAGE SYSTEM (BESS)

TECHNICAL SPECIFICATIONS

1.0 Scope

The Public Works Commission of the City of Fayetteville, Fayetteville, North Carolina seeks firm quotations for the purchase and installation of one (1) Battery Energy Storage System (BESS). These Specifications cover the design, manufacture, delivery, and installation, in good order, for a skid-mounted or containerized energy storage system including battery(ies), controller, inverter, cooling, thermal management (BMS), fire protection, SCADA interface, and all other associated hardware and equipment for a complete and fully operable system. **The Bidder shall furnish all material required to complete the project. The elbows and cable on the HV connection of the transformer will not be supplied by the bidder.** Bids will be received as follows:

Bid Schedule No. 1: Purchase of one (1) 1.44 MW / 5.76 MWh energy storage system for **Butler Warner Generation Plant**.

Bid Schedule No. 2: Purchase of one (1) 1.5 MW / 6 MWh energy storage system for **Butler Warner Generation Plant**.

Bid Schedule No. 3: Purchase of one (1) 1.75 MW / 7 MWh energy storage system for **Butler Warner Generation Plant**.

Bid Schedule No. 4: Purchase of additional Field Service Engineering and optional system O&M

The BESS includes inverters, batteries and enclosures, coordinating site controls and all battery thermal management. Firm quotations should be based upon placement of an order within 120 days from the bid date.

The Owner has the right to select or reject any or all schedules, adders, or deducts (or combination thereof) listed in the Proposal. Base quotations for each BESS shall include the Bidder's risk of delivery to the Butler Warner Generation Plant site in Fayetteville, North Carolina, as described in the Instructions to Bidders, paragraph 5.0. The Owner will provide reasonable roadworthy access to the site. The Bidder shall install the system in accordance to the specifications primarily within the areas labeled Future Expansion #1 using Future Expansion #2 as an alternate and not to exceed those areas as defined in Exhibit 2.

2.0 General Conditions

2.1 All materials and equipment shall be new. Manufacturer origin of all components shall be provided with bid.

2.2 These Specifications describe the type, size, and characteristics of the various materials and equipment required to be furnished.

2.3 Strict adherence to these general Specifications and Drawings is requested to facilitate checking and consideration of the Proposal.

2.4 Proposals shall include the following:

2.4.1 Catalog numbers, manufacturer, ratings, characteristics, types, sizes, etc., of all materials and equipment included. A simple statement that all necessary materials and equipment will be provided is not satisfactory.

2.4.2 Performance data for the several items as set forth in the Detailed Specifications.

2.4.3 A user's list currently employing units of equal design and manufacture in a power utility service environment. The list shall include City business name, address, telephone number, and contact personnel who can provide service history for the product.

2.4.4 Prices shall include the cost of delivery to the Owner's Butler Warner Generation Plant, assuming unloading by the Owner. **Shipment shall be via open-top truck or open trailer.**

2.5 It is the intent of these Specifications that the BESS shall be skid-mounted or containerized, to include the battery(ies), controller, inverter, cooling, thermal management (BMS), fire protection, SCADA interface, and all other associated hardware and equipment for a complete and fully operable system. Any details not mentioned in the Specifications but required for satisfactory operation shall be furnished and installed by the Bidder.

2.5.1 The Bidder shall be responsible for designing, supplying, installing and commissioning ("turn-key") the BESS system up to 480VAC inverter terminals.

- Additionally, the Bidder shall design and install the foundation/pad and conduit system required for the parallel interconnection of the existing Distributed Energy Resource into the newly installed transformer (by bidder per provided specifications).
- The bidder will be responsible for reconnecting the existing DER to the new replacement transformer.

2.5.2 The Bidder shall be responsible for all necessary site civil preparations, supplying and installing concrete pad for BESS, and interconnection from inverter 480VAC terminals to the installation of the MV transformer which shall be connected to the existing 12.47 / 7.2 kV underground cables. The existing cables shall not be spliced, the transformer location may be relocated to ensure the cables are long enough for the new installation but the transformer location shall not impede the adjacent path.

2.6 Station power available at the Owner's site will be 120 volts, 60 Hz, single-phase or 277/480 volts, 60 Hz, three-phase. Control dc voltage at the installation will be 48 volts as required. The equipment on the BESS shall coordinate with these voltages as appropriate.

3.0 Special Conditions

3.1 Defective Materials, Equipment, and Workmanship

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

3.1.2 The materials and equipment furnished hereunder shall become the property of the Owner when delivered at the point to which shipment is to be made; provided, however, that the Owner may reject any such materials and equipment which does not comply with the Specifications for materials and equipment and/or warranties of the Bidder and manufacturers. Recognition and subsequent rejection of any defective materials and equipment may occur either before or after incorporation of such materials and equipment into the facilities, provided such rejection is made within one (1) year of date of delivery of the materials and

equipment. Upon any such rejection, the Bidder shall replace the rejected materials and equipment with materials and equipment complying with the Specifications for materials and equipment and warranties FOB truck at suitable destination. The Owner shall return the rejected materials FOB truck at the same destination. In the event of the failure of the Bidder to so replace rejected materials and equipment, the Owner may make such replacement; and the cost and expense thereof shall be paid by and recoverable from the Bidder.

3.1.3 Product and Performance Warranty

The BESS to be provided herein shall include a full product and performance warranty on the complete energy storage system together with all parts. This warranty shall extend for a minimum of five (5) years from the date of energization (or sixty-eight (68) months from delivery). The warranty shall cover all repair or replacement in case of defects in material or workmanship or in case of diminished system performance/output prior to system end-of-warranty period.

The Bidder shall also state in the proposal additional cost (if any) to provide an alternative option for an extended warranty of ten (10) years from the date of initial energization and up to two-hundred forty-eight (248) months from date of delivery

Any base bid not including at least a five (5) year full warranty shall be considered nonresponsive.

3.2 Miscellaneous

The Bidder shall hold harmless and indemnify the Owner, its agents, and employees from any and all claims, suits, and proceedings for infringement of any patent or patents covering materials and equipment purchased hereunder. The Bidder shall defend any suit or proceeding brought against the Owner, its agents, or employees based upon a claim that the materials and equipment or any part thereof constitute an infringement of any patent; or if the Bidder shall fail to defend such suit or proceeding, the Owner may do so and the Bidder shall make reimbursement for the expense of such litigation. If the materials and equipment, or any part thereof, are held to constitute infringement and the use thereof is enjoined, the Bidder shall, at its own expense, either procure for the Owner the right to continue to use the materials and equipment, or such part thereof, or shall replace the materials and equipment, or such part thereof, with non-infringing materials and equipment.

4.0 Standards

All equipment and materials covered by these Specifications and all test applied thereto shall, unless otherwise stated herein, be in accordance with the applicable provisions of the latest editions of the Standards of the ASTM, ANSI, AEIC, NEMA, NESC, NFPA, IEEE, and OSHA. Where the term "Standards" is used in the Specifications, it shall be understood to refer to the above Standards.

5.0 Drawings

5.1 Preliminary

Before proceeding with fabrication, the manufacturer shall submit for approval to the Owner sufficient Drawings to demonstrate that all parts conform to the requirements and intent of these Specifications. The Drawings shall include outline, nameplate, battery and inverter connection diagrams, ac and dc control elementary, and control wiring. Drawings are to be submitted electronically in AutoCad to Michael Winkler at m.winkler@Booth-Assoc.com. If you choose to submit drawings on paper, then you must supply five (5) sets of "D" (24" x 36") size prints directly to the Owner's Engineer, Booth & Associates, LLC, at 5811 Glenwood Avenue in Raleigh, North Carolina 27612. Submittal of Drawings smaller than "D" size will be immediately returned stamped "not approved" and proper size Drawing will have to be submitted. All Drawings shall be dimensioned in feet and inches; metric measurements alone will not be acceptable. However, dual dimensioning in feet and inches and centimeters will be acceptable.

The Outline Drawing shall show dimensions of equipment, including base anchor dimensions, conduit entrance panel location, and all other important external features. These Drawings shall show weights, vertical and horizontal dimensions, battery and inverter catalog numbers and ampere ratings, description of inverter terminals, and arrangement of all external accessory devices.

Approval of Drawings shall not be held to relieve the manufacturer of obligations to meet all requirements to the Specifications, of responsibility for correctness of the Drawings, or of responsibility to meet original shipping promise on the basis of City being allowed two (2) weeks for approval after receipt of drawings.

The Owner's Engineer, Booth & Associates, LLC may require a second submittal of Shop Drawings if, in the opinion of the Owner's Engineer, such is required due to the extent of changes required on the first submittal. If an extension of time is required due to a protracted drawing approval process, the price will remain as quoted for the quoted delivery.

Receipt of Approval Drawings by the Bidder constitutes authorization for manufacture only, based upon the corrections found thereon.

5.2 Final Drawings

Contingent upon Approval Drawing review and product manufacture, the Bidder shall issue final documentation as follows:

5.2.1 Two (2) complete set of all Drawings, revised to "as-built" status, released on CD-R's in .pdf format and AutoCAD format.

5.2.2 Two (2) copies of applicable instruction books, including one (1) print each of all Drawings representing physical and electric details as furnished per paragraph 5.1.

5.2.3 Two (2) copies of certified test reports corresponding to functional performance measurements after final assembly.

5.2.4 All Drawings are to be certified correct and supplied within a reasonable length of time prior to shipment of the equipment. Each set of Drawings and documentation shall include the following information:

- Outline and Assembly Drawings showing size and location of major components and all principal dimensions.
- Control and relay/breaker panel front view.
- Details of battery, inverter and associated terminal connectors.

5.2.5 Diagram of current transformers, connection, number of turns, polarity marking, ratios, and bushing orientation.

5.2.6 Current transformer performance characteristic curves.

5.2.7 Details of BESS skid/container/control housing.

5.2.8 Panel connection diagram showing exact connection for all components furnished.

5.2.9 Ac and dc elementary circuit diagrams for all relay, breaker and control equipment furnished.

5.2.10 Wiring control and schematic diagrams.

5.2.11 Renewal parts catalog.

All Drawings and documentation shall be submitted directly to the Owner's Engineer, Booth & Associates, LLC, 5811 Glenwood Avenue; Raleigh, North Carolina 27612, Attention: Michael Winkler, PE.

6.0 Shipping of BESS

6.1 Equipment shall be shipped to the Owner's Butler Warner Generation Plant site as outlined in the Instructions to Bidders. **The Bidder shall ship via open-top truck or open trailer for ease of unloading by PWC personnel.**

6.2 Before shipment, BESS shall be completely assembled to determine that all parts fit properly. Parts removed for shipment shall be marked so as to permit easy identification when reassembling.

6.3 Method of packing and loading shall be such as to protect all parts from dampness, corrosion, breakage, or vibration injury that might reasonably be encountered in transportation, storage and handling.

6.4 Release for shipment is to be granted by the Owner's Engineer based upon the manufacturer's compliance with the following:

6.4.1 Fourteen (14) consecutive days prior notification of tests so that the Owner may have a representative present for witness of the tests.

6.4.2 Furnishing of the requisite number of copies of the Final Drawings as called for in the Specifications.

6.4.3 Coordination of manufacturing and delivery with PWC's construction schedule as may be noted in these Specifications.

6.4.4 Thirty (30) days' notification of tentative shipping schedule and forty-eight (48) hours' notification prior to all deliveries.

6.4.5 **Under no circumstances** will the Owner accept deliveries arriving on Saturdays, Sundays, or nationally observed holidays. The Bidder shall take precautions as necessary to avoid scheduling such deliveries. Deliveries will be received between 9:00 a.m. and 3:00 p.m., Monday through Friday only.

7.0 Manufacturer's Field Representative (Engineering / O&M)

The manufacturer shall provide the services of Field Service Labor and Engineer(s) to assist the Owner with pre-service inspection and assembly of the BESS. Suitable effort for Construction, Initial Inspection, Assembly, Start-up and Commissioning shall be included in the base price. Additionally, the manufacturer shall conduct an on-site training for the Owner on proper system interface and maintenance. The Bidder shall also conduct an on-site training for the local Fire Authorities on proper emergency response procedures.

Services provided by the Field Engineer shall include all pre-service inspection procedures outlined in the manufacturer's literature. The Field Service Engineer may also be required by the Owner to perform a series of system tests to satisfy manufacturers' recommendations and Warranty requirements.

The Bidder is also asked to furnish annual O&M rates for consideration. The Bidder shall provide specifics as to type and frequency of recommended O&M services offered to maintain BESS performance and reliability.

8.0 BESS Components / Ratings

8.1 General

The following are general BESS parameters.

8.1.1 Battery Type

Unspecified, Owner will consider all viable technologies. Equal consideration will be given to up front Capital Expenditures as well as on-going or future Operational Expenditures of BESS.

8.1.2 Inverter

Bi-directional, Output 480 VAC, 60 Hz.

8.2 Capacity Rating / Project Life / Tolerance:

8.2.1 Schedule No's. 1, 2 and 3

Battery Energy Storage System (BESS), skid-mount or containerized, to include the battery(ies), controller, inverter, cooling, thermal management (BMS), fire protection, SCADA interface, associated components and furnished with specified accessories. It shall be installed on an appropriately engineered concrete pad. The existing transformer shall be replaced appropriately to serve the existing DER as well as the proposed BESS. It is anticipated that Butler Warner Generation Plant will have adequate load at all times to absorb the energy dispatched by the BESS.

PWC's intent is to purchase only one (1) unit in total from Schedule No's 1, 2 and 3. The owner will be selecting which size unit to purchase while evaluating the proposals.

Schedule No.	Begin-of-Life Power Capacity	Begin-of-Life Energy Capacity	End-of-Life Power Capacity[1]	End-of-Life Energy Capacity[1]	Tolerance
1	1.44 MW	5.76 MWh	1.44 MW	5.76 MWh	±10%
2	1.5 MW	6 MWh	1.5 MW	6 MWh	±10%
3	1.75 MW	7 MWh	1.75 MW	7 MWh	±10%

1. See product and performance warranty section 3.1.3. Bidder shall provide:
   - **a base bid with a minimum 5 year performance period guarantee, and**
   - **also provide an alternative option for a 10 year performance period guarantee.**

8.3 BESS Use Cases

8.3.1 **Peaking Shaving (150 hrs / yr)**

The BESS shall be able operate in parallel with the connected utility at any time, with and without the Owner's other generation assets online. Back-feed beyond the Owner's system shall not be permitted / possible.

The Bidder shall provide specifics as to the BESS's rate of charging/discharging capabilities and limitations (such as required charge

duration, efficiency, high/low capacity limits). **The Owner prefers no more than 18 hours charge duration from BESS low limit capacity to high limit capacity.**

The Owner is not interested in micro-grid capabilities or other use cases for this project.

8.3.2 ~~**Emergency Power Capacity –**~~ **N/A**

~~The BESS shall be capable of dispatching up to 1.5 WM for duration of 30 minutes in cases of emergency.~~

8.4 Seismic Criterion

The BESS shall be designed to withstand seismic events for the applicable seismic zone according to the Uniform Building Code to the extent that a force applied in the direction of least resistance to that loading will not cause any portion of the BESS to be overstressed.

8.5 Ambient Temperature and Humidity

The BESS shall be suitable for operation at an ambient temperature of -30°C (-22°F). Maximum ambient temperature rating shall be 50°C (122°F). Humidity rating shall be up to 100 percent.

8.6 Altitude

The BESS will be installed at an altitude below 3,300 feet.

8.7 Wind and Ice Loading

The BESS shall be designed to withstand wind and ice loading for the NESC heavy loading district and using the extreme wind with no ice loading criteria, utilizing the governing loading case.

8.8 Assembly

The proposed equipment shall be completely assembled, wired, adjusted, and tested at the factory before shipment.

9.0 Battery Inverter Capability

9.1 Inverter Power Rating

The battery inverter is required to have a nameplate capacity as listed in the table listed above in section 8.2.1, and rated for continuous operation at 100% loading.

In addition to the continuous operation, the battery inverter must be able to operate at following overload levels, based on a preload level of 75%. These are assessed based on the current provided from the inverters, compared to the current provided at the nameplate capacity under 1.0 pu voltage.

- 120% of nameplate for at least 10 seconds

This overload functionality is required when the battery system is disconnected from the utility grid and is required to provide fault current under certain fault conditions.

9.2 Inverter Functionality

The Battery Inverter system must be capable of operating both in parallel with the main utility grid as well as with diesel generators. ***Islanding-mode capability is not desired.*** The system must accept frequency and voltage set-points in order to bias the frequency and voltage droop characteristics.

When the existing Distributed Energy Resource(DER) is online, the Battery

Inverter system must be able to operate with voltage-droop and frequency-droop characteristics in order to load share with the online DER.

In addition, the following functions are required by the Battery inverter:

1. Frequency droop control
2. Voltage droop control
3. ~~Voltage and Frequency Reference~~ N/A
4. Virtual generator inertia
5. Real power vs. reactive power limiting
6. Ability to dispatch to manage peak loading of the facility

9.3 Frequency Droop

The inverter system is required to be able to operate in frequency droop mode, whereby the active power output/input is adjusted as a result of the power system frequency. The Battery is required to monitor the system frequency and apply a 'droop curve' to its initial power output based on the measured frequency. The further away from the nominal set-point the system frequency becomes, the larger the initial reaction from the Battery Inverter is required. If the frequency rises, the Battery Inverter must begin to import power from the grid to compensate. If the frequency drops, the Battery inverter must begin to export power to the grid.

This droop characteristic must be configurable, with a 'droop percentage' parameter to relate the drop in frequency to the power output of the Battery inverter, which indicates the percentage of frequency reduction that will be experienced at 100% power output. This droop operates around the 'Frequency Set-point' which is to be adjusted by an external control system.

9.4 Voltage Droop

The inverter system is required to be able to operate in voltage droop mode, whereby the reactive power output/input is adjusted as a result of the measured AC voltage. The Battery is required to monitor the system voltage and apply a 'droop curve' to its initial reactive power output based on the measured voltage. The further away from the nominal set-point the system voltage becomes, the larger the initial reaction from the Battery Inverter is required. If the voltage rises, the Battery Inverter must begin to absorb reactive power from the grid to compensate. If the voltage drops, the Battery inverter must begin to inject reactive power to the grid.

This droop characteristic must be configurable, with a 'droop percentage' parameter to relate the drop in voltage to the reactive power output of the Battery inverter, which indicates the percentage of voltage reduction that will be experienced at 100% power output. This droop operates around the 'Voltage Set-point' which is to be adjusted by an external control system.

9.5 Voltage and Frequency Reference

The battery inverter will not be required to regulate the system voltage and frequency when no other generation is online, as well as in parallel with diesel generators. ***Islanding-mode capability is not desired.***

The battery inverter must be able to seamlessly transition between operational states without disrupting system loads.

The inverter must be capable of receiving frequency and voltage set points to bias the power output of the inverter, so that the external control system can control the charge and discharge of the battery system.

9.6 Virtual Generator Inertia

The battery inverter is required to include a virtual inertia function, which

increases/decreases the active power output of the battery inverter based on the rate of change of frequency on the network. This function must be able to be tuned, such that any large disturbance is damped.

9.7 Real Power vs. Reactive Power Limits

The Battery Inverter is required to be configured such that if a certain combination of real and reactive power set-points exceeds the kVA rating of the inverter, the reactive set-point will automatically be decreased internally to meet the kVA rating.

The BESS shall be capable of maintaining a composite power delivery at continuous rated power output at the Point of Interconnection at a power factor within the range of 0.95 leading to 0.95 lagging.

10.0 BESS Interface, Controls, and Connections

10.1 External Control Interface

The BESS shall be supplied with a fully functioning controller with meter to connect to the Owner's SCADA interface. The bidder shall provide an SEL 735 meter with Advanced power quality options, as well as an empty 9S meterbase for a customer meter. The metering class CTs shall be installed between the inverter and transformer. Bidder shall supply SCADA interface and control details and available parameters with their bid for evaluation. Bidder shall also supply local interface and control details and available parameters with their bid for evaluation. Fiber is utilized at the existing BESS and the bidder shall provide a fiber link between the existing system to the new BESS for SCADA communications. **The Owner uses PRISM by ACS for SCADA interface.**

10.2 Local Manual Controls / Interface

At minimum, the following manual operating controls/interface shall be provided

10.2.1 System Disabled / Enabled

Allows user to safely disable or enable the system locally. Provide function as a key interlock or with provisions to install pad-lock for lock-out-tag-out compliance.

10.2.2 Local / Remote

Allows user to switch operating control from SCADA to Local (ie. HMI) and vice versa.

10.2.3 Manual Reset

Allows user to clear alarm(s) and set unit to ready state.

10.2.4 Emergency Stop

Allows for system shutdown / stop running for servicing or emergency response purposes.

10.2.5 Human Machine Interface (HMI)

Industrial computer screen interface to control and monitor the BESS. The HMI platform and software shall be accessible locally and through a network access. At minimum, the HMI shall be capable of two levels of access credentials (programmable usernames and passwords) – one for the user to observe the system's functions only (no control access), and another giving the user access to control the system.

10.3 AC Connections

The following addresses the respective transformation and distribution equipment

for the battery system interconnection.

10.3.1 Main AC Connection

The main AC connection point will be connected by bus duct / cable to the transformer.

The main AC connection voltage shall be 12.47 / 7.2 kV and shall be run at 60Hz.

10.3.2 Step-Down Step-Up Transformers

The transformers require a solidly earthed electrostatic shield between the LV and HV windings to prevent common-mode noise from the inverter switching being transferred to the MV circuit. The expected magnitude of the potential difference between earth and phase is at least peak phase-neutral voltage + peak battery voltage, or:

$$Vac_{Peak} + Vdc_{Peak}$$

10.3.3 AC Auxiliary Supply

The BESS will be provided a split phase 120Vac/240Vac power connection, which is intended to run the unit controls and building HVAC systems, if equipped. The BESS must be able to maintain the building/enclosure temperature to a nominal level and power the primary system controls using this auxiliary supply alone, when the main AC connection point is disconnected.

11.0 BESS Operation

The following section lists the operations that the Battery Inverter is required to run in and the functionality that this will provide.

11.1 Connection Batteries

Normally the batteries are to remain connected to the Battery Inverter. If required for maintenance, the batteries can be disconnected from the Battery Inverter, isolating the two systems.

11.2 AC Bus Failure

In the event of a 'dead bus' where the load is unable to be sustained by the Battery Inverters or the command to stop has been issued, the Battery Inverters shall remain in a stopped state until commanded to start.

11.3 Grid Disconnection

If the circuit breakers leading from the BESS to the main bus are opened, the Battery will enter an 'inhibit' mode – this will stop the Battery switching and will wait for the circuit breakers to be reclosed before automatically restarting conversion.

11.4 Start Operation

If the Battery Inverter is requested to start when the bus is live, the control system will close the AC Grid circuit breaker, and synchronize to the existing bus voltage and phase. At this point the inverter is on-line and can import or export real or reactive power as determined by the external control system and the internal control loops.

11.5 Stop Operation

If the Battery Inverter is requested to stop, the following procedures must occur:

11.5.1 The Battery Inverter will reduce the power (real and reactive) output to zero according to a ramp function.

11.5.2 The AC Grid circuit breaker will be opened

12.0 BESS System Protection

The following methods of protection are required with the Battery Inverter:

1. System External Inverter Protection
   a. Insulation Monitoring (Earth Fault)
   b. Emergency Stop
   c. Fire Alarm
2. Intrinsic Inverter Protection
   a. Inverter Over-temperature
3. AC Intrinsic Inverter Protection
   a. Anti-islanding (via digital input only)
   b. Over-current
   c. Over-voltage
   d. Under-voltage
   e. Over-frequency
   f. Under-frequency
4. AC External Inverter Protection
   a. Over-current
5. DC Intrinsic Inverter Protection
   a. DC over-current
   b. DC over-voltage
6. DC Intrinsic Battery Protection
   a. Cell over-temperature/temperature imbalance
   b. Cell over-voltage/under-voltage
   c. Cell voltage imbalance
   d. Rack over-charge
   e. Rack under-charge
   f. Rack over-current
7. DC External Protection
   a. DC Over-current

12.1 System External Inverter Protection

The following protections must be provided by equipment external to the battery Inverter.

12.1.1 Insulation Monitoring (Earth Fault)

If the AC or DC busses of the BESS are ungrounded, an insulation monitoring system is required to be integrated into the battery grid AC connections and battery DC connections. This relay must directly monitors the insulation on all three main AC phases down to earth via the injection of intermittent high-frequency pulses. This module must also detect insulation failures on the DC side when the Inverter is switching.

Detection of insulation breakdown must trigger a shunt trip of the BESS AC main circuit breaker and the battery DC circuit breakers.

12.1.2 Emergency Stop

An Emergency Stop button is to be provided on the front door of the control cabinet on each supplied battery inverter. An external input (via volt-free contact) is also required for remote emergency stop purposes (including fire detection shut-down).

Triggering the Emergency Stop will shunt trip the battery Grid AC main circuit breaker and the DC battery circuit breakers.

12.1.3 Fire Alarm

An independent fire alarm/detection should be wired into the Emergency Stop circuit, and should result in a shunt trip the battery Grid AC main circuit breaker and the DC battery circuit breakers, and also shut down all HVAC systems.

12.2 Intrinsic Inverter Protection

The following protection features are required to be built-in to the Battery Inverter.

12.2.1 Inverter Over-Temperature

The inverter requires built-in temperature monitoring that allows the inverter to be automatically shut-down in the event of an over-temperature condition. There should be no user-accessible parameters for this feature.

12.3 AC Intrinsic Inverter Protection

The following AC protection features are requires to be built-in to the Inverter.

It is required that if the Grid AC CB or externally communicated grid breakers are opened, then the inverter will not fault but will enter an 'inhibited' state that will automatically be recovered from once the circuit breakers are re-closed.

12.3.1 AC Over-Current

There are two required levels of over-current protection intrinsic to the inverters:

1. Fuses for each of the phases are required. This is to protect the inverter in case of a fault in the inverter bus.
2. Current limiting is required for any situation where the demand is effectively above 120% of rated current. Temperature sensing of the inverter and an internal timer that 'hard' limits the amount of time that the inverter attempts to provide 120% of rated current before shutting down is required.

12.3.2 AC Over-Voltage

In the event of over-voltage, the Inverter must apply a two stage protection scheme, as described below:

1. Shut-down and stop switching. This leaves the Inverter switches connected to the grid but not switching.
2. Open the internal contactor. An internal contactor that can be opened in extreme over-voltage cases that disconnects the inverters from the grid.

12.3.3 AC Under-Voltage

In the event of under-voltage, the inverter will stop switching and raise a fault. This fault will require the operators to manually reset the inverter prior to re-starting operation.

12.3.4 AC Over-frequency

In the event of over-frequency, the inverter will stop switching and raise a fault. This fault will require the operators to manually reset the inverter prior to re-starting operation.

12.3.5 AC Under-frequency

In the event of under-frequency, the inverter will stop switching and raise a fault. This fault will require the operators to manually reset the inverter prior to re-starting operation.

12.4 AC External Inverter Protection

The following events are protected by external equipment in the Grid AC cabinet.

12.4.1 AC Over-Current

The Grid AC CB must have configurable over-current protection. The trip unit must be configured for three levels of over-current tripping, and the current trip points must be able to be adjusted by as little as 200A steps.

1. Instantaneous
2. Short term
3. Long term

12.5 DC Intrinsic Inverter Protection

The following protection must be provided intrinsically by the inverter:

12.5.1 DC Over-Current

The inverter must have DC bus current monitoring and three levels of DC bus over-current protection.

1. Power limiting takes place inside the inverter to attempt to limit the amount of DC current being fed onto or from the DC bus
2. If the DC over-current threshold is exceeded the inverter will disconnect from the external DC bus via a contactor
3. A pair of fuses installed on the inverter are required to blow to protect the inverter if the over-current is too fast for the software disconnection

12.5.2 DC Over-Voltage

The inverter must have DC bus voltage monitoring and two levels of DC bus over-voltage protection.

1. Power limiting takes place inside the inverter to attempt to limit the amount of DC voltage being fed onto the DC bus
2. If the DC over-voltage threshold is exceeded the inverter will stop switching with a fault code.

12.6 DC Intrinsic Battery Protection

The Battery Management System (BMS) must provide comprehensive protection of the battery strings, and be able to operate independently of the inverter controls.

12.6.1 Cell over-temperature

The BMS must detect an over-temperature condition, and disconnect any battery string that is above the specified thermal limits.

12.6.2 Cell over-voltage/under-voltage

The BMS must detect cell over and under voltages, and disconnect any battery string that is above the specified thermal limits.

12.6.3 Cell voltage imbalance

The BMS must detect a voltage imbalance between battery cells, and disconnect the battery string if this voltage difference is beyond the specific limits.

12.6.4 Rack over-charge

The BMS must detect an over-charge condition for the rack, and disconnect the rack in order to prevent damage to the batteries.

12.6.5 Rack under-charge

The BMS must detect an under-charge condition for the rack, and disconnect the rack in order to prevent damage to the batteries.

12.6.6 Rack over-current

The BMS should monitor the current for each rack, and disconnect the rack if it exceeds the specified current limits. The rack should also have individual fuses to protect against DC wiring faults, or as backup protection to the BMS protection functions.

12.7 External Protection

Circuit breakers must be provided on the DC connection between the batteries and inverters to allow the systems to be isolated from each other. If DC cables are required to run outside of the provided enclosure/buildings, protection must be provided at both the Battery enclosure and the inverter enclosure, using either fuses or circuit breakers.

In the event of a short circuit in any of the DC wiring, the DC circuit breakers should trip.

In the event of an insulation failure to earth of the DC wiring, the insulation monitoring relay must trip the main AC circuit breaker and the DC circuit breakers, isolating all possible points of insulation failure.

The DC circuit breakers must feature thermal/magnetic trip units.

13.0 Other Equipment Details

13.1 Applicable Codes and Standards

In addition to the requirements set forth herein, each BESS component and auxiliary and accessory equipment furnished shall be designed, manufactured, and tested in accordance with the current issue of relevant standards such as, not limited to, ANSI, ASME, NEMA, NFPA, and IEEE. As new and inaugural BESS standards are currently under development, the Bidder shall submit for evaluation a list of standards of which their system is compliant.

13.1.1 All surfaces of steel parts (framework, tank, etc.) shall be cleaned in accordance with the Bidder's standards to remove dirt, scale, and grease prior to painting. This shall be immediately followed by an application of priming of rust-inhibitive paint and the necessary base coat. All steel surfaces shall have a minimum of 3 mils of paint. Paint finish shall be suitable to withstand site environmental conditions.

The exterior surfaces of all bolts, nuts, and washers shall be primed and painted as above, or such parts shall be stainless steel or galvanized. No exposed cadmium-plated parts or zinc chromate-plated parts will be allowed.

13.1.2 Color specification shall be ANSI #70 light gray, or other as approved by Owner, shall be suitable to withstand site environmental conditions.

13.1.3 The BESS shall be completely assembled, wired, adjusted, and tested at the factory before shipment.

13.2 Wiring

13.2.1 All power wiring shall be made with #10 AWG tinned copper wire or larger sized wire. The primary insulation jacket of all wiring shall be 600-volt; 90°C; and water, oil, and flame resistant. Control wiring shall be 45 or 65 stranded cable, Type SIS, and not smaller in size than #14 AWG tinned copper wire, with the exception that wiring to alarm auxiliary relays and indicating lights may be smaller in size. All current transformer leads are to be #10 AWG tinned copper or larger in size.

a. Power wiring shall be sized as required in accordance with the National Electrical Code.

b. All connections for wiring shall be made using silicon bronze, split-type lockwashers, screws, and nuts.

b. All wires shall be identified at each end with legible permanent labels depicting termination location at opposite end.

c. Wiring connections between fixed and hinged sections shall be minimum 41-strand, flexible wire.

d. Seven-stranded control wire is not acceptable.

e. All terminal connections for conductor sizes #10 AWG and smaller shall be made with pre-insulated, full ring tongue, crimp-type lugs. Spade-type terminals or slip-on connectors are not acceptable.

f. All terminal connections for conductor sizes larger than #2 AWG shall be made with two-hole, long-barrel, double-indent crimp-type lugs; (Single-hole lugs may be used only where necessary.)

g. High-temperature insulated wire shall be used for connections to heaters.

13.2.2 Grommets shall be provided for all openings in metal barriers used for wiring.

13.2.3 Uninsulated exposed conductor or terminal lug shall not extend beyond the sides of the terminal block or its insulating barriers.

13.2.4 All leads for multi-ratio current transformers shall be wired to shorting-type terminal blocks in the control cabinet. If junction boxes are required in wiring between current transformer and control cabinet, terminal blocks or splicing sleeves shall be used for wiring connections. In-line type disconnecting terminals such as American Petroleum Institute (API) No. 32448 or Burndy No. YZ10 will not be acceptable.

13.2.5 If accidental short circuiting of certain wires can result in malfunction of equipment such as closing or tripping of the breaker, these wires shall not be terminated on adjacent terminal block points.

13.2.6 All wiring shall be neat and orderly.

13.2.7 No more than two (2) wires per terminal point are permissible.

13.2.8 All termination and grounding points to be landed during onsite installation shall be reasonably accessible without requiring excessive of damaging cable/wire bend radiuses or routing.

13.3 Current Transformers

13.3.1 Current transformers shall be considered part of the breaker and shall be coordinated with the breaker to meet all currents, voltages, and mechanical requirements of the breaker for steady state, surge, and fault conditions.

13.4 Nameplates

13.4.1 Nameplates and their mounting screws shall be of noncorrosive metal and mounted in positions where they can be safely and easily read with the equipment in service.

13.4.2 All relays, switches, contactors, starters, and other devices shall be identified by nameplates.

13.5 Piping and Conduit

Furnish all necessary individual storage tanks, piping, valves, and conduit for the complete assembly of the BESS. Storage tanks required shall be manufactured to the

requirements of the ASME Code Section VIII Division 1 and so stamped and registered with the National Board of Registration. Any safety and/or safety relief valves approved for service on these tanks shall also be constructed in compliance with the latest requirements of the ASME Boiler and Pressure Vessel Code. These valves shall also be stamped and registered with the National Board of Registration.

13.6 Special Tools and Lifting Devices

13.6.1 Furnish two sets of all special tools and hardware required for removal and maintenance of the battery energy storage system assembly/components.

13.6.2 Furnish any special lifting devices required for installation and or maintenance of the system and/or accessories.

13.6.3 Furnish lifting eyes and lugs for vertically lifting the battery energy storage system assembly/components.

13.7 Spare Parts

The Bidder shall furnish with the Proposal a recommended spare parts list and spare parts price list, applicable to each BESS described in the Proposal.

The above requirements are for spare parts and prices in the Proposal, but it is not the intention of this Specification that these parts be furnished as part of the Contract.

13.8 Alarms

The BESS shall be able to self-diagnose and alarm under abnormal conditions. Bidder shall supply comprehensive details of available alarm functions and parameters with their bid for evaluation. Alarms may be categorized as

13.8.1 The following typical alarms are to be identified:

a. Information Status Alarms

b. Warning Alarms

c. Critical/Inhibit Alarms

d. Trip Alarms

14.0 Start-up and Commissioning

14.1 If the BESS or any of the auxiliaries or accessories fails to perform as intended during start-up and commissioning efforts, the Bidder shall be responsible of troubleshooting, diagnosing, and successfully resolving the issue within reasonable time at no additional cost to the Owner. After rework or repair of the failure, the specified start-up and commissioning shall be repeated to ensure that the repaired BESS, auxiliary, or accessories will meet the Specification in all respects.

14.2 Rework or repair and retesting shall be done at Bidder's expense.

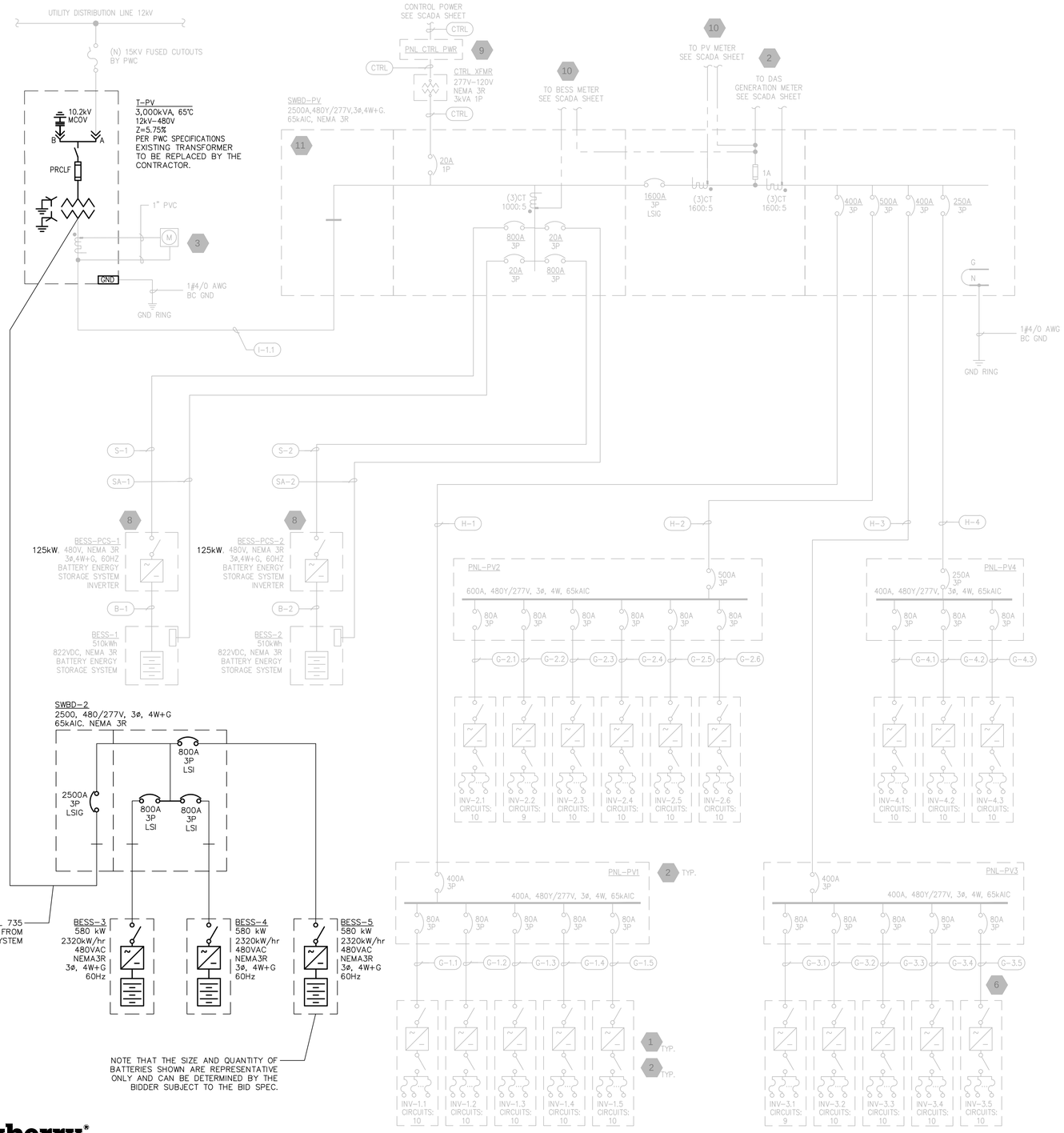
14.3 Bidder shall keep a record of all failures detected during start up and commissioning, of rework or repair required, and of data taken after rework or repairs have been completed.

14.4 Rework or repairs shall be made in accordance with an approved procedure signed by that party responsible to give in-process disposition of such rework or repairs.

14.5 The Field Service Engineer shall perform a series of tests after the BESS is installed to assure that it is functioning properly and that all components and wiring are properly connected. The Field Service Engineer shall give approval for energizing the equipment, and shall remain to observe the entire energization process. **The Field Service Engineer shall also provide training to the Owner's maintenance personnel during checkout of the BESS. The Bidder shall also conduct an on-site training for the local Fire Authorities on proper emergency response procedures.**

EXHIBIT No. 1

CONCEPTUAL ONE-LINE



PHOTOVOLTAIC SYSTEM

TOTAL DESIGN OUTPUT:
950 kWAC
1,201 kWDC STC
3,384 PV MODULES (355W)

ENERGY STORAGE SYSTEM

1.99 MVA / 7.98 MVAh

PHOTOVOLTAIC MODULES

MODULE MAKE AND MODEL	TSM-DE14A(II) PERC MONO
Pmax – MAX POWER AT STC	355.0 W
Voc – OPEN CIRCUIT VOLTAGE AT STC	47.4 V
Vmp – MAX. POWER VOLTAGE AT STC	38.8 V
Isc – SHORT CIRCUIT CURRENT AT STC	9.65 A
Imp – MAX POWER CURRENT AT STC	9.14 A
TEMPERATURE COEFFICIENT OF Voc	-0.29 % / °C
STRING RATINGS	TSM-DE14A(II) PERC MONO
SERIES CONNECTED MODULES IN EACH PV SOURCE CIRCUIT	18
STRING MAX POWER AT STC	6,390 W
STRING Voc AT STC	853.2 V
ASHRAE EXTREME MIN.	-10.0 °C
TEMPERATURE CORRECTION FACTOR	1.102
STRING Voc AT ASHRAE EXTREME MINIMUM	939.8 V
MAXIMUM SERIES FUSE RATING	15.0 A

PV SYSTEM SUMMARY

INVERTER ID	INVERTER TYPE	MODULE TYPE	STRINGS	TOTAL MODULES	kW DC AT STC	INVERTER kW AC	DC:AC RATIO
INV-1.1	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	10	180	63.90	50	1.278
INV-1.2	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	10	180	63.90	50	1.278
INV-1.3	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	10	180	63.90	50	1.278
INV-1.4	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	10	180	63.90	50	1.278
INV-1.5	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	10	180	63.90	50	1.278
INV-2.1	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	10	180	63.90	50	1.278
INV-2.2	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	9	162	57.51	50	1.150
INV-2.3	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	10	180	63.90	50	1.278
INV-2.4	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	10	180	63.90	50	1.278
INV-2.5	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	10	180	63.90	50	1.278
INV-2.6	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	10	180	63.90	50	1.278
INV-3.1	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	9	162	57.51	50	1.150
INV-3.2	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	10	180	63.90	50	1.278
INV-3.3	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	10	180	63.90	50	1.278
INV-3.4	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	10	180	63.90	50	1.278
INV-3.5	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	10	180	63.90	50	1.278
INV-4.1	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	10	180	63.90	50	1.278
INV-4.2	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	10	180	63.90	50	1.278
INV-4.3	SMA STP50-US-41	TSM-DE14A(II) PERC MONO	10	180	63.90	50	1.278
TOTALS			188	3,384	1,201.32	950	1.265

GENERAL NOTES

1. ALL EQUIPMENT SHALL BE UL LISTED OR UTILITY GRADE AND APPROVED BY OWNER, AHJ HAS FINAL JURISDICTIONAL AUTHORITY ON CODE APPLICATION AND COMPLIANCE.
2. ALL EQUIPMENT WIRING AND GROUNDING METHODS SHALL CONFIRM TO MANUFACTURER RECOMMENDED PRACTICES.
3. EXPOSED NON-CURRENT CARRYING METAL PARTS OF EQUIPMENT AND ENCLOSURES SHALL BE GROUNDED IN ACCORDANCE WITH NEC 250.134 AND 250.136(A)
4. ALL BREAKERS AND DISCONNECT SWITCHES ARE CLOSED UNDER NORMAL OPERATING CONDITIONS.

KEYED NOTES

1. SMA TRIPOWER CORE 1, 50kW GRID-TIE SOLAR INVERTER WITH INTEGRATED AC AND DC DISCONNECTS. 50 kW, 53 KVA, 1000VDC INPUT, 480V 3P/3W OUTPUT. INVERTER SHALL PROVIDE DC GROUND FAULT AND ARC FAULT DETECTION AND INTERRUPTION AND BE LISTED TO UL1741 STANDARD. UL1741 LISTING INCLUDES COMPLIANCE WITH IEEE519 FOR POWER QUALITY, IEEE929 FOR INTERCONNECTION SAFETY AND NEC REQUIREMENTS.
2. SEE SCADA LINE DIAGRAM AND EQUIPMENT PAD PLAN FOR DATA ACQUISITION SYSTEM WIRING REQUIREMENTS.
3. PWC TO PROVIDE METER SOCKET AT NEW PAD, AND METERING CONNECTIONS IN NEW PWC TRANSFORMER SECONDARY COMPARTMENT. CONTRACTOR TO PROVIDE 1" PVC CONDUIT BETWEEN METER SOCKET MOUNTING LOCATION AND PWC TRANSFORMER SECONDARY COMPARTMENT. INSTALLATION MUST COMPLY WITH PWC ESS-13.
4. PROVIDE FUSED VOLTAGE TAPS AND CURRENT TRANSFORMERS FOR CUSTOMER METERING AS SHOWN.
5. MEDIUM VOLTAGE STEP UP TRANSFORMER BY PWC, PER PWC SPECIFICATIONS. PLEASE PROVIDE TRANSFORMER SHOP DRAWINGS TO ENGINEER OF RECORD. GROUNDED WYE CONNECTED MV WINDING RECOMMENDED PER IEEE C62.92.6-2017 WYE CONNECTED LV WINDING REQUIRED BY INVERTER MANUFACTURERS. DO NOT BOND TRANSFORMER SECONDARY NEUTRAL TO GROUND. NEUTRAL SHALL BE BONDED TO GROUND AT SWITCHBOARD MAIN DISCONNECT.
6. REFER TO WIRE SCHEDULES ON SHEET E-4.1 FOR FEEDER SIZE
8. NEC ENERGY SOLUTIONS BATTERY ENERGY STORAGE SYSTEM. SEE SCADA LINE DIAGRAM AND EQUIPMENT PAD PLAN FOR COMMUNICATION WIRING REQUIREMENTS.
9. PROVIDE 60A 240V NEMA 3R SUBPANEL FOR 120VAC CONTROL POWER. PROVIDE 15A/1P BREAKERS FOR DAS, PV METER, AND BESS METER.
10. SEL 735 METER IN FACTORY NEMA 3R ENCLOSURE WITH TEST SWITCHES. 120VAC POWER INPUT.
11. PV SWITCHBOARD, 2500A, 480Y/277V, 3ø/4W, 65kAIC, NEMA 3R, TIN-PLATED ALUMINUM BUS. PROVIDE ANTI-CONDENSATION HEATER STRIPS, GROUND BUS IN ALL SECTIONS, AND 100% RATED NEUTRAL. REFERENCE STANDARDS ANSI/NFPA 70 – NATIONAL ELECTRICAL CODE (NEC), NEMA PB2 – DEADFRONT DISTRIBUTION SWITCHBOARDS, UL 891 – DEADFRONT SWITCHBOARDS, UL 489 – MOLDED-CASE CIRCUIT BREAKERS.

CABLE SCHEDULE

ALL NEW MEDIUM VOLTAGE CABLES SHALL BE PROVIDED BY PWC PER PWC SPECIFICATIONS.

ALL NEW LOW VOLTAGE CONDUCTORS SHALL BE:
CU OR AL, THWN-2 OR XHHW-2 INSULATION. UNLESS OTHERWISE NOTED. SIZED AS INDICATED.

ALL PV DC CABLES SHALL BE:
CU. WITH 1000V PV WIRE INSULATION. UNLESS OTHERWISE NOTED.

(F-X.Y) FEEDER IDENTIFIER PER WIRE SCHEDULE ON E-4.x SERIES DRAWINGS

EQUIPMENT NAMING CONVENTION

ID-X.Y (EXAMPLE: INV-1.1)

- Y: EQUIPMENT NUMBER
- X: PANELBOARD NUMBER
- ID: EQUIPMENT DESIGNATION

LEGEND

- EXISTING EQUIPMENT
- EXISTING WIRING
- NEW EQUIPMENT
- NEW WIRING

Dewberry

Dewberry Engineers Inc.
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
FAX: 919.881.9923
NCBELS #F-0929

New equipment and new wiring added by Booth & Associates, LLC for Revision 3

1 ONE-LINE DIAGRAM
E-2.0 SCALE: N.T.S.

Digitally signed by Michael J Winkler
DN: OID.0.9.2342.19200300.100.1.1=A01410D000017579C3301500020D8, CN=Michael J Winkler, O=Booth and Associates, C=US
Date: 2020.12.15 12:17:40 Foxit Reader Version: 9.7.0

NORTH CAROLINA PROFESSIONAL SEAL 044604 ENGINEER MICHAEL J. WINKLER

12/15/2020

NO.	REVISIONS	DATE	BY
1	ISSUED FOR PERMIT	10/10/18	BL
2	REVISED PER PWC COMMENTS	10/30/18	BL
3	ISSUED FOR BIDS NEW EQUIPMENT	12/8/20	MW

PUBLIC WORKS COMMISSION
CITY OF FAYETTEVILLE, N.C.

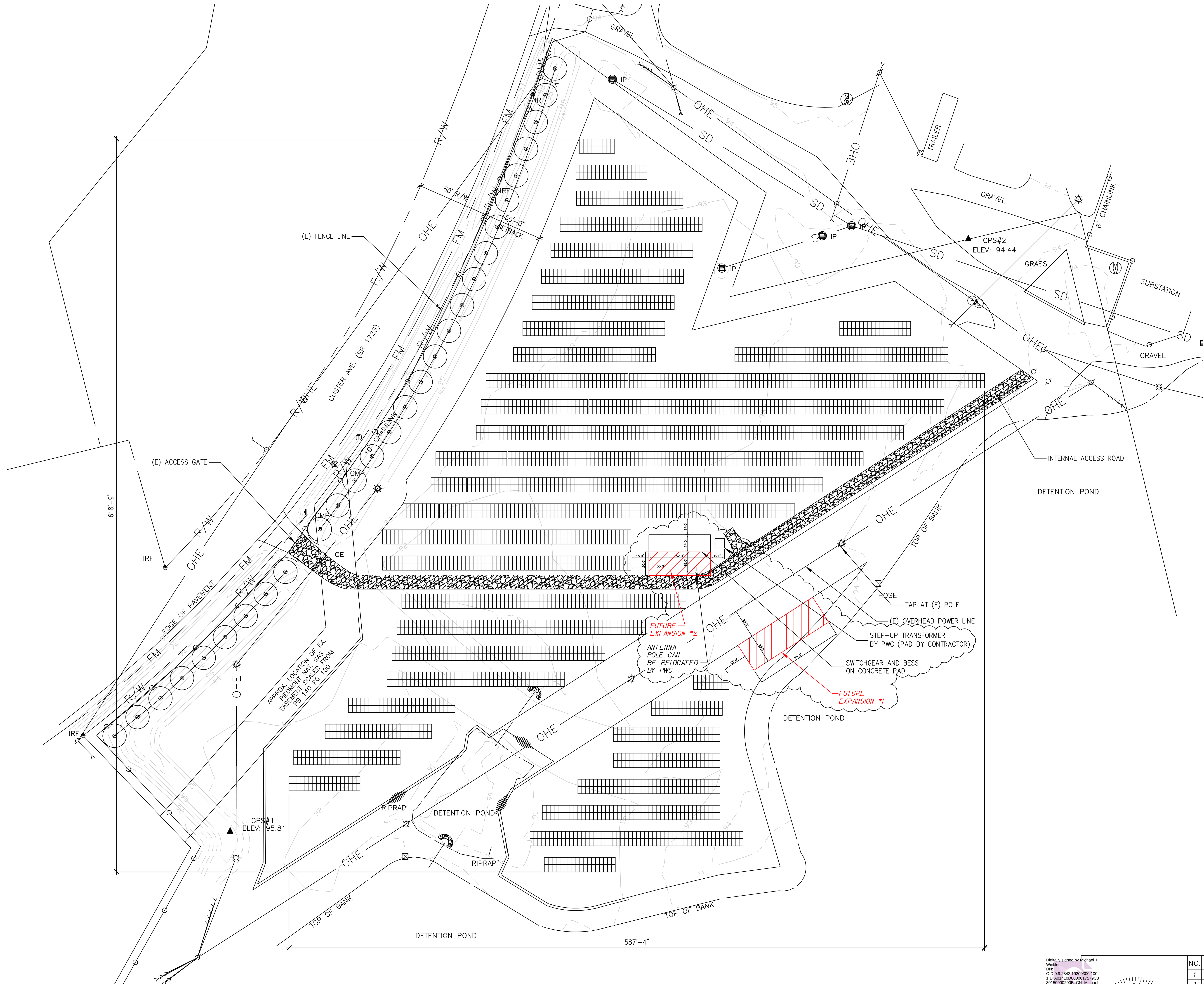
Community Solar & Energy Storage Project

ELECTRIC SYSTEMS ENGINEERING

DWN. GS | DATE 06/25/18 | DWG. NO. E-2.0
CKD. | APPD.
SCALE: N.T.S.

EXHIBIT No. 2

BUTLER WARNER GENERATION PLANT
PROPOSED PROJECT AREA



1 PHOTOVOLTAIC ARRAY SITE PLAN
G-100 SCALE: 1"=40'-0"

0 10' 20' 40' 80'
1" = 40'-0"

SYSTEM SUMMARY

PROJECT LOCATION	FAYETTEVILLE, NC
DESIGN TEMPERATURE (MIN.)	-10°C
PROJECT ELEVATION (MAX)	100'
STRING SIZE	18
MODULE TYPE	TRINA TSM-DE14(II)PERC MONO
MODULE WATTAGE	355
MODULE QTY.	3,384
PV INVERTER	SMA STP50-US-41
PV INVERTER QTY.	19
BATTERY INVERTER	WSTECH BAT280
BATTERY INVERTER QTY.	2
BESS SYSTEM SIZE (AC)	560 KVA
PV SYSTEM SIZE (AC)	950 kWAC
PV SYSTEM SIZE (DC)	1,201 kWDC
ARRAY TYPE	RBI SOLAR GM-NEXTGEN
GROUND COVER RATIO	58.7% (22'-0")
ARRAY TILT	25°
ARRAY AZIMUTH	180°

NOTE: NO PV ARRAY FENCING IS SHOWN, AS REQUESTED BY PWC. ONLY QUALIFIED PERSONS SHOULD ENTER THE PHOTOVOLTAIC ARRAY AREA OR SERVICE PHOTOVOLTAIC SYSTEM EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR SAFETY TRAINING OF ALL PERSONS WHO ENTER THE PROPERTY REGARDING PHOTOVOLTAIC SYSTEM HAZARDS, AND IS RESPONSIBLE FOR RESTRICTING PHOTOVOLTAIC ARRAY ACCESS ONLY TO QUALIFIED PERSONS.

Dewberry®
Dewberry Engineers Inc.
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
FAX: 919.881.9923
NCBELS #F-0929

Clouded Revision 3
added by Booth & Associates, LLC

Digitally signed by Michael J Winkler
DN: OID.0.9.2342.19200300.100.1.1=A01410D0000017579C330150000200B, CN=Michael J Winkler, O=Booth and Associates, C=US
Date: 2020-12-15 12:16:28
Foxit Reader Version: 9.7.0

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044604 MICHAEL J. WINKLER
12/15/2020

NO.	REVISIONS	DATE	BY
1	ISSUED FOR PERMIT	10/10/18	BL
2	REVISED PER PWC COMMENTS	10/30/18	BL
3	ISSUED FOR BIDS	12/8/20	MW

PUBLIC WORKS COMMISSION
CITY OF FAYETTEVILLE, N.C.

Community Solar & Energy Storage Project

ELECTRIC SYSTEMS ENGINEERING

DWN. GS | DATE 06/25/18
CKD. | APPD.
SCALE: 1"=40'-0"
DWG. NO. G-100

EXHIBIT No. 3

VENDOR PRODUCT DATA FORM

VENDOR PRODUCT DATA FORM

Battery

Chemistry Type _____

Manufacturer _____

Model No. _____

Nominal Power Capacity NPC = _____ MW

Nominal Energy Capacity NEC = _____ MWh

State-of-Charge (%) SOC High Limit = _____ SOC Low Limit = _____

Percentage limits of capacity charged/discharged expressed as a percentage of maximum capacity.

Usable Energy Capacity UEC = _____ MWh

(SOC High Limit / 100)(NEC)*

Round-trip Efficiency (%) RTE = _____

The amount of energy that comes out of storagerelative to the amount put into the storage.

Charge Rate CR = _____ Hrs.

The rate at which storage can be charged from SOC Low Limit to SOC High Limit.

Response Time (sec., minutes) RT = _____

The amount of time required to go from no discharge to full discharg.

Expected Useful Life (Years / Cycles) EUL = _____

Assuming specified Use Case, before replacement or rehabilitation required.

Battery Management System

Manufacturer _____

Model No. _____

Inverter

Manufacturer _____

Model No. _____

Station Power Requirements _____

Standard Warranty Period _____

Expected Annual Maintenance Cost _____

BESS Footprint / Space Requirements _____

Applicable Compliance Standards _____

Vendor shall supply all equipment specifications, cut-sheets, and drawings necessary to demonstrate that all parts conform to the requirements and intent of these Specifications