

CONTRACT DOCUMENTS

WASTEWATER PUMP STATION REHABILITATION PROJECT

Contract 1

PUMP CONTROL EQUIPMENT

Purchasing Dept. Contract No. 2012-13

January 9, 2012

Revised January 12, 2012

Prepared for:

Town of Lincoln, Rhode Island
T. Joseph Almond, Town Administrator
100 Old River Road
Lincoln, Rhode Island 02865

Prepared by:

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**TOWN OF LINCOLN
INVITATION TO BID
PUMP CONTROL EQUIPMENT
RFP#2012-13**

Sealed bids for the manufacture and delivery of Pump Control Equipment, Contract 1 of the Wastewater Pump Station Rehabilitation Project (Purchasing Dept. Contract No. 2012-13), will be received at the Office of the Purchasing Agent, 100 Old River Road, Lincoln, RI 02865 until 11:00 AM local time on February 6, 2012 at which time they will be publicly opened and read aloud.

The work includes the manufacture and delivery of wastewater pump station control equipment, enclosures, and appurtenances.

CONTRACT DOCUMENTS may be examined at the Department of Public Works, Engineering Division, 100 Old River Road, Lincoln, RI on or after January 16, 2012.

CONTRACT DOCUMENTS may be obtained on or after January 16, 2012. Bid documents are available online at www.lincolnri.org/departments/purchasing.asp or in PDF file format on CD diskette available at the office of the Purchasing Agent, 100 Old River Road, Lincoln, RI. All bidders must register with the Town in order to be notified of addenda.

Successful bidder must furnish 100% Performance Bond and 100% Labor and Material Payment Bond and the required insurance certificates and execute the Agreement within (10) calendar days following notification of the Acceptance of their Bid.

The Town of Lincoln reserves the right to waive any informalities in, and reject any or all bids, or accept all or any part thereof, and to make awards in a manner deemed in the best interest of the Town of Lincoln, RI.

This project is being funded in part by the Rhode Island Clean Water Finance Agency. The Contractor's attention is called to DBE/MBE/WBE funding requirements.

All bidders must send company information via e-mail to persons listed on the next page.

John Ward – Finance Director
Town of Lincoln, RI

IF YOU HAVE DOWNLOADED THESE FILES
FROM THE TOWN OF LINCOLN'S WEBSITE

PLEASE EMAIL

PEGGY WEIGNER @ pweigner@lincolnri.org

OR

LASZLO SIEGMUND @ lsiegmund@lincolnri.org

WITH YOUR NAME, COMPANY AND EMAIL ADDRESS

ALL ADDITIONAL INFORMATION, ADDENDA, AND ANSWERS
TO QUESTIONS WILL BE EMAILED TO PLAN HOLDERS.

**THE TOWN WILL NOT BE RESPONSIBLE FOR
YOUR FAILURE TO RECEIVE INFORMATION
SHOULD YOU NOT CONTACT THE TOWN AFTER
DOWNLOADING THE PLANS AND SPECIFICATIONS**

INFORMATION FOR BIDDERS

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ARTICLE 1: RECEIPT AND OPENING OF BIDS

Sealed Bids for the work will be received and opened at the time and place indicated in the ADVERTISEMENT FOR BIDS.

Each Bid must be submitted in a sealed envelope addressed to the Town of Lincoln, RI 100 Old River Road, Lincoln, RI 02865 and clearly labeled " Bid Documents" and bear the Contract Number and Project Title. The envelope shall also bear the name and address of the Bidder.

If forwarded by mail, the sealed envelope containing the Bid must be enclosed in a second sealed envelope addressed to the Town of Lincoln, RI 100 Old River Road, Lincoln, RI 02865 and labeled "Bid Documents."

The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities in or reject any and all bids. Conditional or qualified bids will not be accepted. Any bid received after the time and date specified shall not be considered. Should there be reasons why the Contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the bidder.

ARTICLE 2: PREPARATION AND SUBMITTAL OF BID

Each bid must be submitted on the prescribed form. All blank spaces for bid prices must be filled in, in ink or typewritten, both in words and figures. All bids must be prepared in conformity with and shall be based on and submitted subject to all requirements of the Specifications and Drawings, together with all Addenda thereto.

Only the Bid form, Experience Certification, Service and Support form need be submitted.

ARTICLE 3: WITHDRAWAL OF BIDS

Bids may be withdrawn personally or on written or telegraphic request dispatched by the bidder in time for delivery in the normal course of business prior to the time fixed for the opening, provided that written confirmation of any telegraphic withdrawal over the signature of the bidder is placed in the mail and postmarked prior to the time set for the opening of the bids. Negligence on the part of the bidder in preparing his bid confers no right of withdrawal or modification of his bid after such bid has been opened.

No bidder may withdraw their bid within ninety (60) days after the actual date of the opening thereof.

ARTICLE 4: QUALIFICATIONS OF THE BIDDER

The Owner may make such investigations as he deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the Contract and to complete the work contemplated therein.

ARTICLE 5: OBLIGATIONS OF THE BIDDER

Bidders must satisfy themselves by personal examination at the site of the proposed work, by review of the Drawings and the Specifications including Addenda, and by such other means as they may prefer, as to the actual conditions, requirements, and limits of the proposed work, and as to the accuracy of the information and statements herein contained, and the submission of any bid will be accepted by the Owner as satisfactory proof that the bidder has satisfied himself in these respects. The bidder shall not at any time after the submission of a bid dispute or complain of such statements or information, nor assert that there was any misunderstanding in regard to the nature, or amount of work to be done. The failure or omission of any bidder to examine any form, instrument or document shall in no way relieve the bidder of his obligation to furnish all materials and labor necessary to carry out the provisions of the Contract Documents and to complete the contemplated work for the considerations set forth in his bid, if his bid is accepted.

ARTICLE 6: INFORMATION SUPPLIED TO BIDDERS

The Owner shall provide to bidders prior to bidding all information which is pertinent to, and delineates and describes, the land owned and rights-of-way acquired or to be acquired.

The Contract Documents contain the provisions required for the construction of the project. Information obtained from any officer, agent, or employee of the Owner or any other person shall not affect the risks or obligations assumed by the Manufacturer or relieve him from fulfilling any of the conditions of the Contract.

ARTICLE 7: METHOD OF AWARD LOWEST QUALIFIED BIDDER

This Contract is to be awarded based on the **bid deemed to be in the best interests of the Owner**. Factors such as experience, price, financial stability of Bidders, scheduling, references, and other matters deemed important by the Owner will be considered. If the bid for the selected bidder exceeds the amount reserved by the Owner to finance the project, the Owner expressly reserves the right to increase or decrease any class, item, or part of the work, and this reservation includes the omission of any such item, items, class or part of the work as may be decided by the Owner at unit prices submitted by the bidder to bring the Contract within available funds; or the Owner may reject all bids.

Bidders shall supply the names and addresses of major material suppliers and subcontractors when requested to do so by the Owner.

ARTICLE 8: EXECUTION OF THE AGREEMENT

A contract in the form set forth hereinafter will be required to be executed by the successful bidder and the Owner. The attention of all bidders, therefore, is called to the form of the Agreement and the provisions thereof. The party to whom the Contract is awarded will be required to obtain the performance bond and payment bond within ten (10) calendar days from the date when the Notice of Award is delivered to the bidder. The Notice of Award shall be accompanied by the necessary Agreement and bond forms. The Manufacturer shall furnish a performance bond and a payment bond, each in the amount of 100 percent of the Contract Price, with a corporate surety approved by the Owner, as security for faithful performance of Contract.

The Owner within thirty (30) days of receipt of an acceptable performance bond, payment bond and Agreement signed by the party to whom the Agreement was awarded shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the Owner not execute the Agreement within such period, the bidder may by written notice withdraw his signed Agreement. Such notice by withdrawal shall be effective upon receipt of the notice by the Owner.

The time period for holding bids, where Federal approval is not required is 30 days, Saturdays, Sundays and legal holidays excluded, after the opening of bids and where Federal approval is required, the time period for holding bids is 30 days, Saturdays, Sundays and holidays excluded after Federal approval.

ARTICLE 9: NOTICE TO PROCEED

The Notice to Proceed shall be issued within ten (10) days of the execution of the Agreement by the Owner. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the Owner and Manufacturer. If the Notice to Proceed has not been issued within the ten (10) day period or within the period mutually agreed upon, the Manufacturer may terminate the Agreement without further liability on the part of either party.

ARTICLE 10: TIME OF COMPLETION

The bidder must agree to commence work on or before the date specified in the written Notice to Proceed of the Owner and to fully complete the project within 120 consecutive calendar days.

ARTICLE 11: ADDENDA AND INTERPRETATIONS

Questions or clarifications regarding this solicitation will be received via e-mail at the Office of the Town Engineer (lsiegmund@lincolnri.org) until 2:00 P.M. on January 25, 2012. No consideration will be given to requests submitted after the time and date noted above. Any and all interpretations and any supplemental instructions will be in the form of written Addenda to the Specifications, which, if issued, will be e-mailed to all registered bidders not later than January 30, 2012. Failure of any bidder to receive any such addenda or interpretations shall not relieve the bidder from any obligation under his bid as submitted. All Addenda so issued shall become a part of the Contract Documents.

ARTICLE 12: SERVICE CONDITIONS AND INSTALLATION INFORMATION

The ability of the Manufacturer to implement timely service during the warranty period is of utmost importance and will be a factor in selecting the successful bidder. The Owner has set a 4 hour response time for the Manufacturer to respond to emergency calls to effect repairs to or replacement of equipment supplied under this contract. The Manufacturer shall provide with their bid, a written plan which identifies how parts and service repairs will be implemented within the specified time period. Such plan should include spare parts which would be stored local to the Owner and the identification of a local service representative who could respond within the stated time period.

Upon acceptance of shop drawing information, the Manufacturer will be authorized to manufacture one (1) equipment enclosure unit complete with all components for shipment and installation. The unit will be tested for a period of 30 days. The Manufacturer is to carry the cost of shipping and installation of this equipment along with training assistance during that period. Modifications, if any, to the equipment, look, feel and user interface will be made to this panel along with the remaining equipment to be fabricated under this contract. Adjustments in price, if any, will be by mutual agreement based on pricing documentation provided by the Manufacturer and as reviewed and approved by the Owner.

ARTICLE 13: RHODE ISLAND SALES AND USE TAX

Materials and equipment purchased for installation under this Contract are exempt from the Rhode Island

Sales Tax. The exemption from the Sales Tax shall be taken into account by the Manufacturer during bidding.

ARTICLE 14: OWNER'S RIGHT TO DELETE PORTION OF CONTRACT

The Owner reserves the right to delete a portion of this contract after review of submitted bids and prior to or after Bid award. The Manufacturer shall have no claim for anticipated profits or for loss of profits or for increase in prices should the Owner exercise this right.

ARTICLE 15: ADDITIONAL REQUIREMENTS

This project is being funded, in part, from the Rhode Island Clean Water Finance Agency under the State Revolving Fund program (SRF). The Manufacturer must adhere to all program requirements.

TO BE SUBMITTED WITH THE BID

BID FORM

Proposal of _____ (hereinafter called "Manufacturer"), organized and existing under the laws of the State of _____ doing business as _____ * to the Town of Lincoln, RI (hereinafter called "OWNER"):

In compliance with our Advertisement for Bids, BIDDER hereby proposes to perform all work for the manufacturer of Pump Control Equipment in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated below.

By submission of this BID, each BIDDER certifies, and in the case of a joint BID each party thereto certifies as to his own organization, that his BID has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence WORK under this Contract on or before a date to be specified in the NOTICE TO PROCEED and to fully complete the PROJECT within **120** consecutive calendar days thereafter.

BIDDER acknowledges receipt of the following ADDENDA:

ADDENDUM _____ DATED: _____

ADDENDUM _____ DATED: _____

NOTE: The unit or lump sum price for each item must be written in words and figures. In case of discrepancy, the price in words shall govern.

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL PRICE
1	Stand Alone Pump Controls & Equipment Enclosures	17	EA		
TOTAL PRICE IN WORDS: _____					
2	Pump Control Retrofit Equipment	9	EA		
TOTAL PRICE IN WORDS: _____					

TOTAL BID ITEMS 1 – 2 PRICE IN NUMBERS _____

PRICE IN WORDS: _____

Manufacturer shall identify the type of system to be supplied by placing an X in the appropriate space:

PLC based _____ PAC based _____

TO BE SUBMITTED WITH THE BID

BID FORM ALTERNATIVE BID ITEM MANDATORY PRICING REQUIRED

NOTE: The Manufacturer shall provide a day rate for installation assistance to the General Contractor, programming, start-up, and testing of the pump controller equipment to be performed under Contract 2, Installation.

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT PRICE
1A	Installation	1	DAY	

Bidder understands that the Owner reserves the right to reject any or all bids and to waive informalities in the bidding.

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of 60 Calendar Days after the scheduled closing time for receiving bids.

Upon receipt of written notice of the acceptance of this Bid, Bidder will execute the formal contract attached within 10 days, and deliver a Surety Bond or Bonds as required by the General Conditions. The bid security attached in the sum of (\$ _____) is to become the property of the Owner in the event the Contract and Bond are not executed within the time above set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby.

The undersigned declares; that the only person interested in this Proposal as principals are named herein as such; that no official of the Owner and no person acting for or employed by the Owner is interested directly or indirectly in this Proposal, or in any contract which may be made under it, or in any expected profits to arise therefrom; that this Proposal is made in good faith, without fraud, collusion or connection with any other person bidding or refraining from bidding for the same work; that he has examined carefully the said instructions and all other documents bound herewith, and the Contract Drawings relating to the contract covered by this Proposal and hereby makes them part of this Proposal; that he has informed himself fully in regard to all conditions pertaining to the work and place where it is to be done; and that he has made his own examination and carefully checked his estimates of cost and from them makes this Proposal.

Respectfully submitted: _____

By

Contractor (Bidder)

(Signature & Title)

(Business Address)

This Bid must bear the written signature of the bidder. If the Bidder is a partnership, the Bid must be signed by a partner. If the Bidder is a corporation, the Bid must be signed by a duly authorized officer or agent of such corporation, under the seal of the corporation.

TO BE SUBMITTED WITH THE BID

THE BIDDER SHALL COMPLETE THE FOLLOWING EXPERIENCE CERTIFICATION

The Bidder states that they are actively engaged in the manufacture, installation and service of pump control equipment as specified and required under this Contract and have been so engaged for a period of not less than 10 years. The Owner reserves the right to inspect the Bidder's manufacturing facility to insure acceptability.

Bidder Certification: _____

Signature of owner/manager/representative

The Bidder shall provide the project name, location, and contact information for at least five projects completed within the last five years.

Project Name	Location	Contact Information (name/phone/e-mail)

TO BE SUBMITTED WITH THE BID

SERVICE AND SUPPORT

The Manufacturer shall attach a narrative and documentation in compliance with “Information to Bidder” Article 12 “Service Conditions and Installation Information”.

CONTRACT AGREEMENT

THIS AGREEMENT, made this _____ day of _____ by and between The Town of Lincoln, Rhode Island hereinafter called "OWNER" and _____ doing business as (an individual), or (a partnership), or (a corporation) hereinafter called "MANUFACTURER."

WITNESSETH: that for and in consideration of the payments and agreements hereinafter mentioned;

The MANUFACTURER shall commence and complete the manufacturer of the Wastewater Pump Station Control Equipment.

The MANUFACTURER will furnish all of the material, supplies, tools, equipment, labor and other services necessary for the construction and completion of the PROJECT described herein.

The MANUFACTURER will commence the work required by the CONTRACT DOCUMENTS within 10 calendar days after the date of the NOTICE TO PROCEED and will complete the same within 120 consecutive calendar days unless the period for completion is extended otherwise by the CONTRACT DOCUMENTS.

The MANUFACTURER agrees to perform all the WORK described in the CONTRACT DOCUMENTS and comply with the terms therein for the amount of \$ _____ as shown in the Bid Schedule.

The term "CONTRACT DOCUMENTS" means and includes the following:

ADVERTISEMENT FOR BIDS
INFORMATION TO BIDDERS
BID PROPOSAL AND EXPERIENCE
BONDS
CONTRACT AGREEMENT
NOTICES OF AWARD AND TO PROCEED
GENERAL CONDITIONS
SPECIAL CONDITIONS
TECHNICAL SPECIFICATIONS
DRAWINGS AND TECHNICAL SPECIFICATIONS

Addenda: No. _____ dated _____ 20 .
No. _____ dated _____ 20 .

The OWNER will pay the MANUFACTURER in the manner and at such times as set forth in the General Conditions such amounts as required by the Contract Documents.

Retention from progress payments will be in accordance with the requirements stipulated in the General Conditions.

This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in triplicate each which shall be deemed an original on the date first above written.

OWNER: _____
BY: _____
NAME: _____
TITLE: _____

(SEAL)
ATTEST: _____
NAME: _____
TITLE: _____

MANUFACTURER: _____
BY: _____
NAME: _____
ADDRESS: _____

(SEAL)
ATTEST: _____
NAME: _____

This contract and the bonds referenced herein are approved as to form and legality.

GENERAL CONDITIONS

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reserved by the OWNER to increase or diminish them as may be deemed necessary or desirable by the OWNER. Such increases or decreases shall in no way affect this Contract, nor shall any such increases or decreases give cause for claims or liabilities for damages.

ARTICLE I-4 CONFLICTING CONDITIONS

Any provisions of these General Conditions which may be in conflict or inconsistent with any of the articles in the Special Conditions shall be void to the extent of such conflict or inconsistency.

ARTICLE I-5 REMEDIES

Except as may be otherwise provided in this Contract, all claims, counterclaims, disputes and other matters in question between the OWNER and the Manufacturer arising out of or relating to this agreement or the breach thereof will be decided in a court of competent jurisdiction within the State in which the Owner is located.

PART II

ARTICLE II-1 TERMINATION FOR DEFAULT; DAMAGES FOR DELAY; TIME EXTENSIONS

If the Manufacturer refuses or fails to prosecute the work, or any separable part thereof, with such diligence as will insure its completion within the time specified in this Contract, or any extension thereof, or fails to complete said work within such time, the OWNER may, by written notice to the Manufacturer, terminate his right to proceed with the work or such part of the work as to which there has been a delay. In such event, the OWNER may take over the work and prosecute the same to completion, by Contract other otherwise, and may take possession of and utilize in completing the work such materials, appliances, and plant as may be on the site of the work and necessary therefore. Whether or not the Manufacturer's right to proceed with the work is terminated, he and his sureties shall be liable for any damage to the OWNER resulting from his refusal or failure to complete the work within the specified time.

ARTICLE II-2 CONTRACT SECURITY

The Manufacturer shall furnish a surety bond in an amount equal to at least one hundred percent (100%) of the Contract Price as security for the faithful performance of the Contract, and for the payment of all persons performing labor on the project under this Contract and furnishing materials, equipment and all other incidentals in connection with this Contract. This Surety on such a bond shall be a duly authorized surety company satisfactory to the OWNER and the cost of the same shall be paid by the Manufacturer. Prior to the starting of any work, the bonds must be approved by the OWNER.

ARTICLE II-3 PAYMENT SCHEDULE AND PERIODIC ESTIMATES

Within five (5) days after the date of "Notice to Proceed", the Manufacturer shall deliver to the OWNER an estimated progress schedule in a form satisfactory to the OWNER, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the Contract Documents and the anticipated amount of each monthly payment that will become due the Manufacturer in accordance with the progress schedule.

ARTICLE II-4 GENERAL GUARANTEE

Neither the final certificate of payment nor any provision in the Contract Documents nor partial or entire occupancy of the premises by the OWNER shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Manufacturer of liability in respect to any express warranties or responsibility for faulty workmanship or materials. The Manufacturer shall remedy any defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of one year (1) from the date of final acceptance of the work, unless a longer period is specified by the OWNER. The OWNER will give final notice of observed defects with reasonable promptness.

PART III

The rights and obligations of the OWNER under this Contract shall include, but not be limited to the following:

ARTICLE III-1 THE OWNER'S AUTHORITY

The OWNER shall give all orders and directions contemplated under this Contract and specifications relative to the execution of the work. The OWNER shall determine the amount, quality, acceptability, and fitness of the several kinds of work and materials which are to be paid for under this Contract and shall decide all questions which may arise in relation to said work and the construction thereof. The OWNER'S estimates and decisions shall be final and conclusive, except as herein otherwise expressly provided. In case any question shall arise between the parties hereto relative to said Contract or specifications, the determination or decision of the OWNER shall be a condition precedent to the right of the Manufacturer to receive any money or payment for work under this Contract affected by such questions. The OWNER shall decide the meaning and intent of any portion of the specifications and of any plans or drawings where the same may be found to be obscure or be in dispute. Any differences or conflicts in regard to their work which may arise between the Manufacturer and other Manufacturers performing work for the OWNER, shall be adjusted and determined by the OWNER.

ARTICLE III-2 RIGHT OF THE OWNER TO TERMINATE THE CONTRACT

In the event that any of the provisions of this Contract are violated by the Manufacturer, or any of his sub-contractors, the OWNER may serve written notice upon the Manufacturer and the Surety of its intention to terminate the Contract, such notice to contain the reasons for such intention to terminate the Contract. If within ten days (10) such violation or delay shall not cease and satisfactory arrangement or correction made, the Contract shall, at the expiration of the ten days, cease and immediately serve notice thereof upon the Surety and the Manufacturer, and the Surety shall have the power to take over and perform the Contract, provided, however, that if the Surety does not commence performing thereof within ten days (10) from the date of mailing to such Surety a Notice of Termination, the OWNER may take over the work and prosecute the same to completion by CONTRACT or force account at the expense of the Manufacturer, and the Manufacturer and his Surety shall be liable to the OWNER for any excess cost occasioned the OWNER thereby.

ARTICLE III-3 INTERPRETATION OF THE DRAWINGS AND SPECIFICATIONS

Except for the Manufacturer's executed set, all drawings and specifications are the property of the Owner. The Owner will furnish the Manufacturer, without charge, three (3) sets of the drawings and specifications. Additional sets will be furnished upon request, at actual cost of reproduction. Such drawings and specifications are not to be used on other work and those sets in usable condition shall be returned to the Owner upon request at the completion of cessation of the work or termination of the Contract.

ARTICLE III-4 SUSPENSION OF WORK

- a. The Owner may order the Manufacturer in writing to suspend, delay, or interrupt all or any part of the work for such period of time as he may determine to be appropriate for the convenience of the Owner.
- b. If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted by an act of the Owner in administration of this Contract, or by his failure to act within the time specified in this Contract (or if no time is specified, within a reasonable time), an adjustment shall be made for any increase in the cost of performance of this Contract (excluding profit) necessarily caused by such unreasonable suspension, delay, or interruption and the Contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent (1) that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Manufacturer or (2) for which an equitable adjustment is provided for or excluded under any other provision of this Contract.

- c. No claim under this clause shall be allowed (1) for any costs incurred more than 20 days before the Manufacturer shall have notified the Owner in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order), and (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of such suspension, delay or interruption, but not later than the date of final payment under the Contract.

PART IV

ARTICLE IV-1 ASSIGNMENTS

The Manufacturer shall not assign the whole or any part of this Contract or any monies due or to become due hereunder without the written consent of the Owner. In case the Manufacturer assigns all or part of any monies due or to become due under this Contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any monies due or to become due to the Manufacturer shall be subject to prior claims of all persons, firms, or corporations for services rendered or materials supplied for the performance of the work called for in this Contract.

ARTICLE IV-2 SHOP OR SETTING DRAWINGS

- a. The Manufacturer shall submit promptly to the Owner six (6) copies of each shop or setting drawing prepared in accordance with a schedule predetermined by the Manufacturer. After examination of such drawings by the Owner, and the return thereof, if resubmission is required, the Manufacturer shall make such corrections to the drawings as have been indicated and shall furnish the Owner with six (6) corrected copies. Regardless of corrections made in or approval given to such drawings by the Owner, the Manufacturer will, nevertheless, be responsible for the accuracy of such drawings and for their conformity to the drawings and specifications, unless he notifies the Owner in writing of any deviations at the time he furnishes the drawings.
- b. Shop drawings of all fabricated work shall be submitted to the Owner for approval and no work shall be fabricated by the Manufacturer save at his own risk until approval has been given by the owner. The Special Conditions define the shop drawings required for this project.
- c. The Manufacturer shall submit all shop and setting drawings on dates sufficiently in advance of requirements to enable the Owner ample time for reviewing the same, including time for correcting, resubmission and reviewing, if necessary, and no claim for delay will be granted the Manufacturer by reason of his failure in this respect.
- d. All shop drawings submitted must bear the stamp of the Manufacturer as evidence that the drawings have been checked by him. Any drawings submitted without this stamp of approval will not be considered and will be returned to the Manufacturer for resubmissions. If the shop drawings show deviations from the requirements of the Contract Documents because of standard shop practice or other reason, the Manufacturer shall make specific mention of such variation in his letter of transmittal to the Owner, in order that an acceptable, suitable action may be taken for proper adjustment; otherwise the Manufacturer will not be relieved of the responsibility for executing the work in accordance with the Contract Documents even though the shop drawings have been approved.
- e. Where shop drawings are submitted by the Manufacturer that indicate a departure from the Contract which the Owner deems to be a minor adjustment in his interest and not involving a change in the contract price or extension of time, the Owner may approve the drawings but the approval will contain in substance, the following:

"The modification shown on the attached drawings is approved in the interest of the Owner to effect an improvement for the project and is ordered with the understanding that it does not involve any change in the

contract price or an extension of time, that it is subject generally to all contract stipulations and covenants; and that it is without prejudice to any rights of the Owner under the contract and bond or bonds."

- f. The approval of the shop drawings will be general and shall not relieve the Manufacturer from the responsibility for adherence to the Contract, for any error which may exist.
- g. The Manufacturer agrees to hold the Engineer and the Owner harmless and defend them against damages or claims for damages arising out of injury to others or property of third persons which result from errors on shop, working or setting drawings whether or not they have been approved by the Engineer and/or the Owner.

ARTICLE IV-3 MANUFACTURER'S TITLE TO MATERIALS

No material, supplies, or equipment for the work shall be purchased by the Manufacturer or any sub-contractor, subject to any chattel mortgage or under a conditional sale or other agreement by which an interest therein or in any part thereof is retained by the seller or supplier. The Manufacturer warrants good title to all material, supplies, and equipment installed or incorporated in the work and further warrants upon completion of all work, to deliver the premises, together with all improvements and appurtenances constructed or placed thereon by him, to the Owner free from any claims, liens, or charges, or encumbrances and further agrees that neither he nor any person, firm or corporation furnishing any material or labor for any work covered by this Contract shall have the right to a lien upon the premises or any improvement or appurtenance thereon.

ARTICLE IV-4 PATENTS

- a. The Manufacturer shall hold and save the Owner harmless from liability of any nature or kind, including cost and expenses for, or on account of, and patented or unpatented invention, process, article, or appliance manufactured or used in the Contract, including its use by the Owner.
- b. License and/or royalty fees for the use of a process which is authorized by the Owner must be reasonable, and paid to the holder of the patent, or his authorized agent, directly by the Manufacturer.
- c. If the Manufacturer uses any design, device or material covered by letters, patent, or copyright, he shall provide for such use by suitable agreement with the Owner or such patent or copyrighted design, device, or material.
- d. It is mutually agreed and understood that, without exception, the contract prices shall include all royalties, license fees, or costs arising out of the use of such process, design, device, or materials, in any way involved in the work. The Manufacturer and/or his Surety shall indemnify and save the Engineer and the Owner harmless from all claims for infringement by reason of use of such patented material, device or design, in connection with the work under this Contract, and shall indemnify the Engineer and the Owner for any cost, expense, or damage which it may be obligated to pay for reason of such infringement at any time during the prosecution of the work.

PART V

ARTICLE V-1 INSURANCES

The Manufacturer shall be responsible for maintaining insurance coverage in force for the life of this Contract of the kind and adequate amounts to secure all of his obligations under this Contract and with insurance companies licensed to write such insurance in the State of Rhode Island and acceptable to the Owner. The kinds and amounts of such insurance carried shall not be less than the kinds and amounts of insurance coverage designated in the Special Conditions, and the Manufacturer agrees that the stipulation herein of the kinds and minimum amounts of coverage or the acceptance by the Owner of certificates indicating the kinds and limits of coverage shall in no way limit the liability of the Manufacturer to any such kinds and amounts of insurance coverage. All policies issued shall

indemnify and save harmless the Owner, the Engineer, and their agents or representatives from any and all claims for damages arising out of the Contract, to either persons or property.

All insurance specified in this Contract shall be provided by the Manufacturer, at no additional expense to the Owner.

ARTICLE V-2 PAYMENTS TO MANUFACTURER

- a. At least ten (10) days before each progress payment falls due (but not more often than once a month), the MANUFACTURER shall submit to the OWNER a partial payment estimate filled out and signed by the MANUFACTURER covering the WORK performed during the period covered by the partial payment estimate and supported by such data as the OWNER may reasonably require. If payment is requested with the OWNER'S permission on the basis of materials and equipment not incorporated in the WORK but delivered and suitably stored at or near the site, in accordance with the manufacturer's recommendation and as required by the Owner, the partial payment estimate shall also be accompanied by such supporting data satisfactory to the OWNER as will establish the OWNER'S title to the material and equipment applicable insurance. The OWNER will within ten (10) days after receipt of each partial payment estimate either indicate in writing his approval or return the partial payment estimate to the MANUFACTURER indicating in writing his reasons for refusing to approve payment. In the latter case, the MANUFACTURER may make the necessary corrections and resubmit the partial payment estimate. The OWNER will within thirty (30) days of presentation to him of an approved partial payment estimate pay the MANUFACTURER a progress payment on the basis of the approved partial payment estimate. The OWNER shall retain fifteen (15) percent of the amount of each payment plus any additional percent which is specified in these documents.
- b. Prior to SUBSTANTIAL COMPLETION, the OWNER, with the approval and concurrence of the MANUFACTURER, may use any completed or substantially completed portions of the WORK. Such use shall not constitute an acceptance of such portions of the WORK.
- c. The MANUFACTURER will indemnify and save the OWNER or the OWNER'S REPRESENTATIVE harmless from all claims growing out of the lawful demands of suppliers incurred in the furtherance of the performance of the WORK. The MANUFACTURER shall at the OWNER's request furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged or waived. If the MANUFACTURER fails to do so the OWNER may, after having notified the MANUFACTURER, either pay unpaid bills or withhold from the MANUFACTURER'S unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the MANUFACTURER shall be resumed in accordance with the terms of the CONTRACT DOCUMENTS be construed to impose any obligations upon the OWNER to either the MANUFACTURER, his Surety, or any third party. In paying any unpaid bills of the MANUFACTURER, any payment so made by the OWNER shall be considered as a payment made under the CONTRACT DOCUMENTS by the OWNER to the MANUFACTURER and the OWNER shall not be liable to the MANUFACTURER for any such payments made in good faith.

ARTICLE V-3 CHANGE ORDERS

- a. The Owner may, at any time, without notice of the sureties, by written order designated or indicated to be a Change Order, make any change in the work within the general scope of this Contract, including but not limited to changes:
 1. In the Specifications (including drawings and designs);

2. In the method or manner of performance of the work;
 3. In the Owner-furnished facilities, equipment, materials, services, or site; or
 4. Directing acceleration in the performance of the work.
- b. Any other written order or an oral order (which terms as used in this paragraph (b) shall include direction, instruction, interpretation or determination) from the Owner, which causes any such change, shall be treated as a change order under this clause, provided that the Manufacturer gives the Owner written notice stating the date, circumstances and source of the order and that the Manufacturer regards the order as a Change Order.
- c. Except as herein provided, no order, statement, or conduct of the Owner shall be treated as a change under this clause or entitle the Manufacturer to an equitable adjustment hereunder.
- d. If any change, by change order, causes an increase or decrease in the Manufacturer's cost of, or the time required for, the performance of any part of the work under this Contract, an equitable adjustment shall be made and the Contract modified in writing accordingly: Provided, however, that no claim for any change order (b) above shall be allowed for any costs incurred more than 20 days before the Manufacturer gives written notice as therein required: and, provided, further, that in case of defective specifications for which the Owner is responsible, the equitable adjustment shall include only increased cost reasonably incurred by the Manufacturer in attempting to comply with such defective specifications.
- e. If the Manufacturer intends to assert a claim for an equitable adjustment under this clause, he must, within 30 days after receipt of a written change order under (a) above or the furnishing of a written notice under (b) above, submit to the Owner a written statement setting forth the general nature and monetary extent of such claim, unless this period is extended by the Owner. The statement of claim hereunder may be included in the notice under (b) above.
- f. No claim by the Manufacturer for an equitable adjustment hereunder for any amount shall be allowed unless agreed to by Change Order prior to the work being done.

ARTICLE V-4 CHANGES IN THE WORK

No changes in the work covered by the approved Contract Documents shall be made without having prior written approval of the Owner. Charges or credits for the work covered by the approved changes shall be determined by one or more, or a combination of the following methods as the Owner shall direct:

- a. Unit price bid previously approved;
- b. The actual cost of: labor, materials, ownership or rental costs of construction plant and equipment during the use of item on the extra work; power and consumable supplies for the operation of power and equipment;
- c. Insurance;

ARTICLE V-5 CLAIMS FOR EXTRA COST

No claims for extra work or cost will be allowed unless the same were done in pursuance of a written order of the Owner as aforesaid, and the claim presented with the first estimate after the changed or extra work is done. When the work is performed under terms specified elsewhere in the Contract, the Manufacturer shall furnish satisfactory bills, payrolls, and vouchers covering all items of cost and upon the Owner's request, give him full access to the accounts relating thereto.

ARTICLE V-6 CHANGES AND MODIFICATIONS

The Owner reserves the right to delete or cancel any item or items or parts thereof as listed in the bid, without recourse by the Manufacturer. The Owner also reserves the right to add to any item as listed in the bid. The compensation to be paid to the Manufacturer for such additional extensions, appurtenances, or items shall be made under the applicable items in the bid. If no applicable items are provided in the bid, the compensation to be paid the Manufacturer shall be set forth under the article entitled "Changes in the Work" as found herein.

ARTICLE V-7 ACCEPTANCE OF THE FINAL PAYMENT CONSTITUTES RELEASE

The acceptance of the Final Payment by the Manufacturer shall be and shall operate as a release to the Owner for all claims and all liability to the Manufacturer for all things done or furnished in connection with this work and for every act or neglect of the Owner and others relating to or arising out of this work. No payment, however, final or otherwise, shall operate as a release of the Manufacturer or his Surety from any obligations under this Contract or the performance and payment bond.

SPECIAL CONDITIONS

ARTICLE 1: INSURANCES

The Manufacturer shall provide the following insurance in accordance with the General Conditions:

FIRE, DAMAGE AND THEFT INSURANCE

During the development of the project, the Owner shall make progress payments for equipment to be stored at the Manufacturer's site. To protect the Owner's interests, the Manufacturer will be required to provide insurance for equipment "owned by the Owner and stored by the Manufacturer for coverage against loss by fire, lightning, windstorm, hurricane, cyclone, tornado, hail, explosion, riot, riot attending strike, aircraft, smoke and vehicle damage, theft, and vandalism. This insurance shall be in an amount equal to 100 percent of the insurable portion of the equipment stored at the Manufacturer's facility.

ARTICLE 2: REQUIRED SUBMITTALS

The following submittals shall be made in accordance the General Conditions:

All equipment and software to be incorporated into the work.

Six copies of shop drawings are required

No equipment shall be purchased nor work initiated until approved shop drawings bearing the signature of the Engineer has been issued.

RHODE ISLAND
CLEAN WATER FINANCE AGENCY
PROGRAM REQUIREMENTS

Disadvantaged Business Enterprise Program
DBE Subcontractor Performance Form

Disadvantaged Business Enterprise Program
DBE Subcontractor Utilization Form

Disadvantaged Business Enterprise Program
DBE Subcontractor Participation Form

Good Faith Efforts

What is the Purpose of the Good Faith Efforts?

The Good Faith Efforts are methods employed by all EPA financial assistance agreement recipients to ensure that disadvantaged business enterprises (DBEs) have the opportunity to compete for procurements funded by EPA financial assistance funds.

What Are the Good Faith Efforts?

- ❖ Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. For Indian Tribal, State and local government recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources.
- ❖ Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.
- ❖ Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. For Indian Tribal, State and local Government recipients, this will include dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.
- ❖ Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.
- ❖ Use the services and assistance of the SBA and the Minority Business Development Agency of the Department of Commerce.
- ❖ If the prime contractor awards subcontracts, require the prime contractor to take the steps in paragraphs (a) through (e) of this section.

What are the New Contract Administration Provisions?

When the DBE rule goes into effect, there are a number of new provisions designed to prevent unfair practices that adversely affect DBEs. Those provisions are as follows:

- ❖ A recipient must require its prime contractor to pay its subcontractor for satisfactory performance no more than 30 days from the prime contractor's receipt of payment from the recipient.
- ❖ A recipient must be notified in writing by its prime contractor prior to any

termination of a DBE subcontractor for convenience by the prime contractor.

- ❖ If a DBE subcontractor fails to complete work under the subcontract for any reason, the recipient must require the prime contractor to employ the Six Good Faith Efforts if soliciting a replacement subcontractor.
- ❖ A recipient must require its prime contractor to employ the Six Good Faith Efforts even if the prime contractor has achieved its fair share objectives.

What are the New Forms Associated With the New Contract Administration Provisions?

EPA Form 6100-2 - DBE Program Subcontractor Participation Form. This form gives a DBE subcontractor the opportunity to describe the work the DBE subcontractor received from the prime contractor, how much the DBE subcontractor was paid and any other concerns the DBE subcontractor might have.

EPA Form 6100-3 - DBE Program Subcontractor Performance Form. This form captures an intended subcontractor's description of work to be performed for the prime contractor and the price of the work submitted to the prime.

EPA Form 6100-4 – DBE Program Subcontractor Utilization Form. This form captures the prime's intended use of an identified DBE subcontractor, and the estimated dollar amount of the subcontract.

Form	Requirement	Provided By	Completed By	Submitted To
EPA Form 6100-2	Recipients required to have prime contractors provide form to Subcontractors	Prime Contractors	DBE Subcontractors	EPA DBE Coordinator
EPA Form 6100-3	Recipients required to have prime contractors provide form to Subcontractors	Prime Contractors	DBE Subcontractors	Recipients as part of bid or proposal package
EPA Form 6100-4	Recipients required to have prime contractors complete the form	Recipients	Prime Contractors	Recipients as part of bid or proposal package



Environmental
Protection Agency

OMB Control No: _____
Approved: _____
Approval Expires: _____

**Disadvantaged Business Enterprise Program
DBE Subcontractor Utilization Form**

BID/PROPOSAL NO.	PROJECT NAME
NAME OF PRIME BIDDER/PROPOSER	E-MAIL ADDRESS
ADDRESS	
TELEPHONE NO.	FAX NO.

The following subcontractors¹ will be used on this project:			
COMPANY NAME, ADDRESS, PHONE NUMBER, AND E-MAIL ADDRESS	TYPE OF WORK TO BE PERFORMED	ESTIMATE D DOLLAR AMOUNT	CURRENTLY CERTIFIED AS AN MBE OR WBE?

I certify under penalty of perjury that the forgoing statements are true and correct. In the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302(c).

_____	_____
Signature Of Prime Contractor	Date
_____	_____
Print Name	Title

¹Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.



Environmental
Protection Agency

OMB Control No: _____
Approved: _____
Approval Expires: _____

Disadvantaged Business Enterprise Program DBE Subcontractor Utilization Form

The public reporting and recordkeeping burden for this collection of information is estimated to average fifteen (15) minutes. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed EPA DBE Subcontractor Utilization Form to this address.



Environmental
Protection Agency

OMB Control No: _____
Approved: _____
Approval Expires: _____

**Disadvantaged Business Enterprise Program
DBE Subcontractor Participation Form**

NAME OF SUBCONTRACTOR¹	PROJECT NAME
ADDRESS	CONTRACT NO.
TELEPHONE NO.	E-MAIL ADDRESS
PRIME CONTRACTOR NAME	

Please use the space below to report any concerns regarding the above EPA-funded project (e.g., reason for termination by prime contractor, late payment, etc.).

CONTRACT ITEM NO.	ITEM OF WORK OR DESCRIPTION OF SERVICES RECEIVED FROM THE PRIME CONTRACTOR	AMOUNT SUBCONTRACTOR WAS PAID BY PRIME CONTRACTOR

_____	_____
Subcontractor Signature	Title/Date

¹Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.



Environmental
Protection Agency

OMB Control No: _____
Approved: _____
Approval Expires: _____

Disadvantaged Business Enterprise Program DBE Subcontractor Participation Form

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Environmental
Protection Agency

OMB Control No: _____
Approved: _____
Approval Expires: _____

**Disadvantaged Business Enterprise Program
DBE Subcontractor Performance Form**

NAME OF SUBCONTRACTOR ¹		PROJECT NAME
ADDRESS		BID/PROPOSAL NO.
TELEPHONE NO.		E-MAIL ADDRESS
PRIME CONTRACTOR NAME		
CONTRACT ITEM NO.	ITEM OF WORK OR DESCRIPTION OF SERVICES BID TO PRIME	PRICE OF WORK SUBMITTED TO PRIME CONTRACTOR
Currently certified as an MBE or WBE under EPA's DBE Program? _____ Yes _____ No		
_____ Signature of Prime Contractor		_____ Date
_____ Print Name		_____ Title
_____ Signature of Subcontractor		_____ Date
_____ Print Name		_____ Title

¹Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.



Environmental
Protection Agency

OMB Control No: _____
Approved: _____
Approval Expires: _____

Disadvantaged Business Enterprise Program DBE Subcontractor Performance Form

The public reporting and recordkeeping burden for this collection of information is estimated to average fifteen (15) minutes. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed EPA DBE Subcontractor Performance Form to this address.

TECHNICAL SPECIFICATIONS INDEX

DIVISION 1	GENERAL REQUIREMENTS
01000	Scope of Work
01150	Measurement and Payment
DIVISION 13	SPECIAL CONSTRUCTION
13430	Pump Control Equipment

SECTION 01000 - SCOPE OF WORK

PART 1.00 - GENERAL

1.01 DESCRIPTION

- A. The proposed work includes but is not specifically limited to:
- 1 Design, fabrication, shop testing, and delivery of pre-assembled duplex pump control cabinets contained within a stainless steel enclosure.
 - 2 Design, fabrication, shop testing and delivery of duplex pump control cabinets intended for retrofit within existing steel enclosures.
 - 3 Transmittal to the Owner of recommended spare parts.
 - 4 Training of Owner personnel.

1.02 SEQUENCE OF FABRICATION

- A. Shop drawings will be prepared detailing all components, layout, and operation of the required equipment.
- B. The Manufacturer will be authorized to fabricate one (1) pre-assembled duplex pump control cabinet with stainless steel enclosure and to ship that panel to the Owner for mounting to the concrete support block by others.
- C. The Manufacturer will install and integrate the existing auto dialer equipment provided by the Owner into the panel and provide startup, programming and testing of the integrated pump controller equipment.
- D. During a 30 day period, the Owner will evaluate the equipment for performance, layout, and user interface. Following the 30 day equipment demonstration, the Owner in conjunction with the Manufacturer, will determine the benefit and cost of any recommended changes. Changes involving cost will be made under the change order provision as defined under the General Conditions.
- E. When the Owner is satisfied that the equipment will perform as required, the Manufacturer will be provided with a written release to fabricate the remaining equipment as may be modified by change order.
- F. Concurrently with this work, the Owner will contract separately for the sequential removal of the existing equipment and the physical mounting of the new stainless steel enclosures to the concrete support blocks. Under that procurement, The General Contractor will be required to engage the services of the Manufacturer for the installation, final wiring connections, basic programming and programming of set control points, retrofit of existing panels and to perform startup and testing of each installed unit.
- G. Units shall be shipped when completed in quantities to maximize cost effective shipping and in a continuous stream throughout the duration of the project so that installation under another contract can proceed uninterrupted.

END OF SECTION

SECTION 01150 - MEASUREMENT AND PAYMENT

PART 1.00 - GENERAL

- 1.01 This section describes the measurement of and the payment for the work to be done under the items listed in the Bid.
- 1.02 Each Unit or Lump-Sum Price stated in the Bid shall constitute full compensation for all labor, equipment, materials and all incidental and appurtenant work required or necessary to satisfactorily complete the specified work in the accordance with the Drawings and Specifications.
- 1.03 Appurtenant items of work shown on the Drawings or specified or required to complete the work but not listed separately under the list of items in the Bid shall be included in the cost of payment under the various applicable bid items of work and no separate payment will be made for such items. It shall be the responsibility of the Manufacturer to verify any missing or incomplete items.

PART 2.00 - MEASUREMENT AND PAYMENT

2.01 STAND ALONE PUMP CONTROLS & EQUIPMENT ENCLOSURES

- A. Item 1, Stand Alone Pump Controls & Equipment Enclosures shall be measured by the unit price.
- B. The unit prices for Item 1 shall constitute full compensation for preparation of shop drawings, fabrication, shop testing, shipping, and warranty service as defined in these specifications.

2.02 PUMP CONTROL RETROFIT EQUIPMENT

- A. Item 2, Pump Control Retrofit Equipment shall be measured by the unit price.
- B. The unit prices for these items shall constitute full compensation for field verification of existing equipment sizes, shop drawings, fabrication, shop testing, shipping and warranty service as defined in these specifications.

2.03 ALTERNATE BID ITEM

- A. Item 1A, Installation shall be measured by the unit price.
- B. The unit price for this item shall constitute full compensation for providing on-site services to the General Contractor for Contract 2 for installation assistance,, wiring, programming, startup, testing, cooperation and coordination with the General Contractor to be engaged under Contract 2 and is to include all costs associated with travel and travel related expenses, tools, equipment, labor and all miscellaneous costs to satisfactorily complete this work item.

2.04 MISCELLANEOUS ITEMS

- A. Payment and full compensation for miscellaneous items such as but not limited to bonds, insurances, contract administration, compliance with SRF funding requirements, superintendence, and payroll record keeping shall be considered included in payment items 1, 2, and 1A.

END OF SECTION

SECTION 13430 – PUMP CONTROL EQUIPMENT

PART 1.00 - GENERAL

1.01 GENERAL DESCRIPTION

- A. The Manufacturer shall provide 17 duplex pump control panels complete with accessory equipment within a stainless steel enclosure as specified herein.
- B. The Manufacturer shall provide 9 duplex pump control panels intended for retrofit within existing stainless steel enclosures.
- C. The equipment to be supplied shall be of open architecture design and will not include proprietary equipment to enable open source procurement for parts and service.

1.02 QUALITY ASSURANCE

- A. All control panels and related accessories shall be provided by a single systems integrator responsible for design, manufacturing, startup service and training.
- B. The systems integrator shall be certified by Underwriters Laboratories (UL). Each control panel shall include UL508 and UL698A serialized labels.
- C. All control panel layout and wiring shall be in accordance with National Electric Code (NEC) and National Electrical Manufacturers Association (NEMA).
- D. The Manufacturer shall submit documentation verifying that it has been engaged for at least ten (10) years in the manufacturing of pump control panels of similar size and scope to the control panels specified in this section.
- E. Enclosures and controls shall be as manufactured by Advanced Controls Inc. Pittsburgh, PA, Optimum Controls Corp. Reading, PA, or an equal as approved by the Engineer.

1.03 SUBMITTALS

- A. The following information shall be provided in submittals:
 - 1 Description of operation
 - 2 Detailed drawing of enclosure
 - 3 Detailed control panel layout
 - 4 Detailed elementary wiring diagrams indicating all connections within the control panel as well as all field connections
 - 5 Loop diagrams
 - 6 Bill of material
 - 7 Catalog cuts for all components and accessories
 - 8 Factory test procedure
 - 9 Field startup procedure
 - 10 List of recommended spare parts
 - 11 Point-to-Point wiring diagrams

1.04 FIELD VERIFICATION

- A. The Manufacturer shall be totally responsible for verifying dimensions and the equipment space available in the existing stainless steel enclosures.

1.05 ENCLOSURE LABELING

- A. Each pre-manufactured enclosure and retrofit enclosure bank panel shall have an embossed stainless steel label 2" wide by 6" long containing the station identification number and name in 1" tall Arial font capital letters. Station names can be abbreviated.
- B. For pre-manufactured enclosures, the label shall be affixed to the outside panel door in the upper right hand corner with stainless steel screws/bolts. For the field retrofit systems, the label shall be affixed to the upper left hand corner of the back panel.

1.06 PRODUCT IDENTIFICATION

- A. All retrofit equipment shall be separated by pump station facility, boxed separately, and clearly marked showing the identification of pump station ID number and name.

1.07 EQUIPMENT SIMILARLTY

- A. Each and every prefabricated and field retrofit Controller shall be identical including: component manufacturer, layout and placement, wiring, wiring color coding, terminal connections, interface software, and programming. The only permitted variation will be for pump start kits, and pump hp/phase/voltage wiring which will be different based on the Pump Inventory List.

1.08 SEQUENCE OF THE WORK

- A. Shop drawings will be prepared detailing all components, layout, and operation of the required equipment.
- B. The Manufacturer will be authorized to manufacturer one (1) of the seventeen (17) pre-assembled duplex pump control cabinets and accessory equipment located within stainless steel enclosures and to ship that equipment to the Owner for installation by the Manufacturer.
- C. The owner will select the pump station for pilot testing. The Owner will coordinate and pay for: 1) the existing equipment to be disconnected and removed from the site, 2) have the new stainless steel enclosure mounted to the concrete base, and 3) install the float system, transducer, and pressure transmitter within the wet well.
- D. The Manufacturer shall provide point to point wiring diagrams indicating the required terminations to connect the existing auto-dialer. The Manufacturer shall be responsible for all programming, startup and testing.
- E. During a 30 day period, the Owner will evaluate the equipment for performance, layout, and user interface.
- F. Following the 30 day equipment pilot demonstration, the Owner in conjunction with the Manufacturer, will determine the benefit and cost of any recommended changes. Changes involving cost will be made under the change order provision as defined under the General Conditions.
- G. When the Owner is satisfied that the equipment is performing as required, the Manufacturer will be

provided with a written release to fabricate the remaining equipment as may be modified by change order.

1.09 BASIC DESCRIPTION OF OPERATION

The pump control panel shall operate two (2) submersible sewage pumps. Primary level control shall be provided using a submersible level transmitter. The submersible level transmitter, located in the wet well, shall transmit to the PLC a 4-20 mA signal proportional to the wet well level. Pump start/stop setpoints and alarm setpoints shall be programmed through the PLC and shall be adjustable.

Automatic Mode

As the wet well level increases, the Lead Pump shall start at the "Lead On" setpoint. If the wet well level continues to rise while the Lead Pump is running, the Lag Pump shall start at the "Lag On" setpoint and the Lead Pump and Lag Pump shall operate in parallel. If the wet well level continues to rise with both the Lead Pump and Lag Pump operating in parallel, then an alarm shall be triggered when the wet well level reaches the "High Alarm" setpoint.

As the wet well level decreases, the Lag Pump shall stop when the wet well level reaches the "Lag Pump Off" setpoint and the Lead Pump shall stop when the wet well level reaches the "Lead Pump Off" setpoint. If the wet well level drops to the "Low Level Alarm" setpoint, then an alarm shall be triggered. The Low Level Alarm shall be cleared automatically if the wet well level rises above the Low Level Alarm setpoint for at least 30 seconds.

A float backup system shall automatically engage upon activation of a high level float switch and provide automatic operation of the pumps in the event of a failure of either the PLC or the submersible level transmitter. The float backup system shall operate on three (3) floats (Float Low Level Alarm and all Pumps Off, Lead Pump On, Lag Pump On and Float High Level Alarm). If the wet well level reaches the Float High Level Alarm float switch, then the float backup system shall be engaged. The float backup system shall include an alternation relay which alternates the Lead Pump designation on each successive activation of the Lead Pump On float switch. A reset pushbutton shall be included to reset the system back to PLC control. The operator shall also have an "Auto/Float Backup" selector switch to manually engage the float backup system for maintenance. A pilot light shall be included to indicate when the float backup system is active.

1.10 ELECTRICAL SERVICE

The incoming electrical service for all stations except # 9 Davies is 120/240VAC, 100Amp, single phase, 60 Hz. Incoming electrical service for Station #9 Davies is 120/208VAC three phase.

PART 2.00 - EQUIPMENT

2.01 ENCLOSURE

- A. The minimum sized concrete base is 60" x 30". The Manufacturer shall select an enclosure size which fits the base dimensions. All enclosures shall be identical.
- B. Provide a free standing heavy-duty stainless steel weather-tight and corrosion resistant pedestal enclosure with sealed neoprene gasketing around all edges of the door. Pedestal enclosures shall be made of 14 gauge stainless steel. Submit drawing with all dimensions shown for all installed devices.
- C. Enclosures shall have a sidewall mounted exhaust fan and intake louvers on the opposite sidewall. Ventilation louvers shall be equipped with filters, fan shall be equipped with a thermostat. Doors shall have vault type operating handles with three point catch. Doors shall be fully gasketed with opening of

sufficient size to permit ready removal of any of the equipment installed in the compartments. Door shall have provisions for pad locking.

- D. Pedestal enclosures shall be bolted to the concrete pad on stainless steel feet using Type 316 stainless steel hardware.
- E. All hardware shall be Type 316 stainless steel.
- F. The existing enclosure configurations are a combination of right and left side conduit connections. The Manufacturer shall configure the equipment layout of the new stainless steel enclosures to permit either right or left side conduit connections.

2.02 MANUAL TRANSFER SWITCHES:

- A. The manual transfer switch shall be UL 1008 listed, designed for an emergency and normal source of 240 Volts, 1 Phase, 3 Wire, 100 Amp, 60 Hertz. C
- B. Each switch shall be of open type for mounting within the pedestal enclosure.
- C. The transfer switch shall be of double throw dual circuit breaker construction.
- D. The transfer switch shall be service entrance rated with a main circuit breaker and a minimum rating of 22,000 AIC.

2.03 TRANSIENT VOLTAGE SURGE SUPPRESSOR

- A. Provide a surge protection device (SPD) on the incoming power lines to the controller to protect the control equipment against surges and spikes in electrical power.

1. Certify unit listed to UL 1283 and UL 1449, 2nd Edition.
2. Provide suppression without independently isolated fuses.
3. TVSS to include surge counter and audible alarm.
4. Ratings:

Maximum Continuous Operating Voltage (MCOV)

Voltage	MCOV
120 V	150V
480V	640V

Protection Mode	Single Pulse Surge Current Capacity/Mode	Repetitive Surge Current Capacity Mode
L-N	100,000 amps	4,500 impulses
L-G	100,000 amps	4,500 impulses
L-L	100,000 amps	4,500 impulses

2.04 MOTOR STARTERS AND START/RUN CAPACITORS

- A. A NEMA rated, 60 Hertz, 600 Volt, magnetically operated, full voltage non-reversing motor starter

shall be provided for each pump. NEMA sizes shall be as required for the horsepowers of each pump.

- B. Overload relays shall be adjustable and manually reset.
- C. All pumps are manufactured by ABS USA, 140 Pondview Drive, Meriden, CT. The use of ABS recommended start and run capacitor equipment is essential for total system compatibility. Since different model pumps are utilized throughout the system, it is imperative that the Manufacturer configure each station with the correct pump starter kit. The Manufacturer shall coordinate with the local ABS representative to insure that the equipment to be provided will be compatible with the existing pumping equipment. A chart listing the pump equipment for each installation is attached to this section.
- D. The Owner will be installing the newer PE model ABS pumps at a future date. The Manufacturer shall coordinate with ABS to insure that adequate space is provided to accommodate start/run capacitor kits and/or motor starters for the newer model pump equipment.

The following information is provided to assist the Manufacturer. However it shall remain the responsibility of the Manufacturer to verify equipment and physical size requirements with ABS.

Timing	Pump Model	HP	Voltage	Phase	Start Kit part no.
Existing	M25/2W	3	230	1	08776003
Future	PE25/2W	3.4	230	1	08776102
Existing	M50/2W	5	230	1	08776005
Future	PE45/2W	6.0	230	1	08776104

2.05 MAIN POWER DISTRIBUTION PANEL

- A. Provide a 100A, 120/240V, 1-phase, copper bus, NEMA 1 enclosure panelboard within the pedestal enclosure.
- B. Circuit breakers shall be quick-make, quick break, thermal-magnetic, molded case, bolt-in type with visible trip position.
- C. A 2-pole circuit breaker shall be provided for each pump for branch circuit protection. Each circuit breaker shall be sized accordingly for the pump horse powers.
- D. 1-pole, 20 Amp circuit breakers shall be provided for all of the electrical enclosure branch circuits including lighting, receptacles, control power, etc.
- E. Panel board shall have a minimum rating of 22,000 AIC.

2.06 POWER METER SOCKET

- A. The Power Meter Socket and Meter will be provided and installed by others on site.

2.07 HIGH AMPERAGE PLUGS AND RECEPTACLES

- A. Provide a UL 1682 Listed wall mounted 240VAC, 100 Amp, 1-phase, 3-wire plus ground wall mounted male inlet plug on the exterior of the pedestal enclosure
- B. Housing shall be NEMA 4X with 30 degree mounting angle.
- C. Provide matching a single receptacle for field installation on a generator power cable. Receptacle

shall be NEMA 4X rated with provisions for connection to a cable/cord of same amp rating as the plug.

2.08 ENCLOSURE ACCESSORIES

- A. In each cabinet enclosure provide a light with light switch, a 250 Watt, thermostatically controlled heater, ground bus, and a duplex 120 Volt weather-proof convenience outlet.

2.09 EXISTING AUTO DIALER

- A. Existing auto-dialer equipment is model no. VM500 as manufactured by Microtechnologies, Inc. Berlin, CT. The Manufacturer shall become familiar with the physical space and wiring requirements for this equipment. At some facilities, cable modems are installed. The Manufacturer shall allocate a space within the equipment enclosure of approximately 12" square to mount the cable modem. Location of allocated space shall be identical for each facility.
- B. The Manufacturer shall field mount the auto dialer equipment for both the pre-assembled and the retrofit equipment. Alarm channels shall be identically wired for all installations.

2.10 PROGRAMMABLE LOGIC CONTROLLER (PLC)

- A. The SCADA controller shall be intelligent, modular unit, capable of both data acquisition and local data processing. It shall monitor and control local equipment in a stand alone mode as well as being an intelligent node in a distributed system. It shall be based on multiprocessor architecture, in which a co-processor is used for handling on-board input/output channels. To facilitate initial installation, maintenance and future expansion, all external input/output modules shall connect to the basic controller using a high speed internal bus.

The SCADA controller shall be configured and programmed with standard programming languages such as Relay Ladder Logic (RLL) IEC 6-1131-3 open programming standard and/or C/C++. Programs shall be developed and downloaded either directly to the controller using a standard RS-232 interface cable, or remotely through the communication network media such as phone lines, dedicated lines, or wireless radios.

The controller must be supplied with the number and type of input/output modules and communication ports as indicated elsewhere in the specifications. Future expansion may be made by simply plugging in additional input/output modules to the I/O bus.

- B. SCADA controller hardware specifications:

The controller shall include the following:

1. Central Processing Unit (CPU):
 - a. The central processing unit shall be high speed (minimum 120 MHz), 32 bit RISC microprocessor with 32 internal and external bus. The design should incorporate a separate co-processor for controlling input/output channels.
 - b. The CPU shall be equipped with at least 8 MB RAM for application programs, 2 MB FLASH Memory for firmware and application programs, and 1MB CMOS RAM for storing system parameters and configuration.
 - c. The CPU shall include a real time clock/calendar, accurate to within one minute per

month, with lithium battery backup. The battery will maintain the memory and clock/calendar for two years of power off time.

- d. Diagnostic LEDs shall be included for the following:
 - Power supply
 - Program Run/Stop
 - Communication parameters such as transmit, receive, clear to send, request to send, and carrier detect.
 - CPU Status
 - Forcing
- e. To minimize power consumption, all LEDs controlled by the CPU must be disabled to reduce power consumption. A push button switch on the CPU module shall allow the LEDs to turn on when field service is being performed.
- f. The controller shall include a built-in power supply allowing AC and DC input. The power supply must be capable of providing 24 VDC output to power field transmitters.

2. Mixed process input/output:

- a. The controller shall include the following:
 - 16 digital inputs
 - 12 mechanical relays digital outputs
 - 8 isolated analog inputs
 - 2 analog outputs (where required)
- b. Digital inputs must be available for 12/24 Vrms/DC, 115 Vrms or 220 Vrms input ranges and shall tolerate 150% over-voltage.
- c. In addition to the above mentioned I/O, The controller shall include at least three high speed counters (up to 5 KHz) rated at 12/24 Vrms/dc. The counters shall also function as digital inputs.
- d. Digital outputs will be configured as follows:
 - 2 Form C individually isolated
 - 2 Form A individually isolated
 - 8 Form A with common ground for each group of four
 - 220 Vrms/240 Vdc maximum operating voltage
 - 1000 Vrms contact isolation
- e. An isolated open-collector status output for fault annunciation shall be included in addition to the outputs described above.
- f. Analog inputs shall be 0-5 V or 0-20mA, 15 bit resolution, \pm 0.2% accuracy over the operating temperature range, \pm 0.1% accuracy at 77 \pm F (25 \pm C) with 1500W transient suppresser on each input. Inputs shall be single ended and isolated from logic circuitry.
- g. The controller shall include one internal temperature measurement channel, readable in C or F to indicate the operating temperature, for remote monitoring via the communication network, or use within the application software.

- h. The controller shall include one RAM battery voltage measurement channel which can be monitored remotely via the communication network.
- i. Analog outputs will support 12 bit resolution, 0-20mA or 4-20mA software selectable, +/- 0.2% accuracy over the operating temperature range, 0.05% accuracy at 77 deg F (25 deg C) with 600W transient suppresser on each output.
- j. The controller I/O shall be controlled by high performance co-processor.
- k. The state of digital and/or analog output shall be configurable to hold last output value or go to off condition when the application program is stopped.
- l. Terminal blocks shall be removable and can accommodate solid or standard wires from 22 to 12 AWG. This allows module replacement without disturbing the field wiring.
- m. The controller must be capable of supporting the following input/output points in total:
 - 512 digital inputs
 - 512 digital outputs
 - 128 analog inputs
 - 64 analog outputs
 - 64 frequency inputs

3. Communication:

- a. The RTU shall possess a minimum of three built-in communication ports with the following characteristics:
 - One Ethernet port 10BaseT
 - Three RS-232, software controlled with full DCE/DTE operation to 38400 baud
 - One RS-232, software controlled with full DCE/DTE operation to 115,200 baud
- b. The RTU shall support asynchronous operating mode, half and full duplex transmission.
- c. SDI-12 (Serial Data Interface at 1200 baud): The controller shall support communication to SDI-12 slave devices as follows:
 - The controller shall have an independent C++ to generate SDI-12 protocol messages.
 - Protocol messages shall be triggered by means of a companion Ladder Logic or IEC61131-3 application via a Modbus register table
 - SDI-12 protocol messages shall be sent out of an RS232 port.
 - An external interface shall be provided to convert serial SDI-12 RS-232 signal levels to SDI-12 levels.

4 Mechanical Design:

- a. The controller shall be DIN rail mounted with screw clamp for vibration resistance.

Front access to all controls, indicators, lithium battery, communication ports and power supply shall be provided. Communication ports shall be standard RJ-45 RS-232 to allow easy access using standard cables. No proprietary communication cables shall be allowed.

- b. All boards shall be coated with conformal coating, for protection against humidity and corrosion. In order to minimize the cabinet size, the controller shall have a maximum footprint area of 51.2 square inches (333.3 cm).
- c. Where sockets are used, they must be machined type and be gold plated. Bifurcated or leaf contacts are not allowed.
- d. All system components must be constructed of corrosion resistant zinc plated steel with removable metal covers.

5 Environment:

The controller shall operate over an ambient temperature range of -40 deg F to 158 deg F (-40 deg C to 70 deg C) with a relative humidity 5% to 95%, non-condensing. The RTU shall operate from 16 Vrms, 50/60Hz or 12-24 VDC. 115/240 Vrms operation shall be provided through the use of an optional transformer.

6. Certifications and Standards:

- a. All inputs and outputs (except the serial communication ports) must survive ANSI/IEEE C37.90 surge withstand capability (SWC) tests without damage.
- b. The controller must be certified for electrical safety by UL as conforming to UL 508 or CSA as conforming to CSA C22.2/142.
- c. The controller shall meet or exceed the following standards:
 - Surge withstand capability: ANSI/IEEE C37.90
 - RF emission compatibility: FCC part 15, Subpart J, Class A
 - Electrical safety classification: UL 508/CSA C22.2/142
 - Hazardous area classification: CSA Class 1, Division 2, Group A,B,C,D
 - CE standards: EN55011, EN55022, EN60082-1, EN60082-2 and EMC directive 89/336/EEC
 - GOST standards: 8.009-84, 12997-84, 22261-92, 26203-80, 291125-91, PR 50-2-009-94

C. Communication Protocol:

1. The RTU shall support the industry standard DNP3 protocol, as well as DNP/TCP and DNP/UDP for Ethernet communication, with the following minimum features:
 - DNP3 Level 2 conformant with most features from Level 3 refer to the Device Profile for additional information
 - Local and remote configuration via DNP3 and file transfer
 - Peer-Peer communications
 - Routing - serial-serial, serial-Ethernet communications
 - Issue controller commands remotely (file, application, event management, diagnostic

- capture, etc)
- Reporting to up to 3 independent DNP3 Masters

Proprietary protocols will not be permitted.

2. The controller shall be able to receive information from other sites and retransmit the message to another site, using the same communication port.
3. The controller shall allow flexible communication algorithms on all communication ports. Any of the ports can act as a Level 2 or 3 Master, Level 1 Slave or Level 3 mimic at any time during the execution of the application program.
4. The controller shall be capable of storing up to 20,000 DNP3 events. There shall be no user scripting required to generate or send events.
5. Time-stamped events can be selectively generated per digital point and per analog point alarm limit.
6. Individual alarm limits on analog points can selectively generate DNP3 unsolicited reports.
7. The RTU shall support the industry standard Modbus protocol, as well as Modbus/TCP and UDP for Ethernet communication, with the following minimum features:
 - Allows up to 65,535 stations in one system
 - Ability to transfer complete programs and data over the communication network
 - Support high data security techniques such as Cyclic Redundancy Check CRC16

Proprietary protocols will not be permitted.

8. The controller shall be able to receive information from other sites and retransmit the message to another site, using the same communication port.
9. The controller shall allow flexible communication algorithms on all communication ports. Any of the ports can act as Master, Slave or Store-and-Forward at any time during the execution of the application program.
10. The RTU shall be able to function as an interconnection point between different communication systems such as radio, leased lines, and radios with different frequencies.
11. The RTU shall be able to send broadcasting messages to a number of locations.
12. The RTU shall be able to perform report-by-exception (event driven communications) under the control of the application program.
13. The RTU shall be capable of supporting both DNP3 and Modbuscon currently on the same communications ports.
14. The RTU shall support programming of custom protocols for data interchange on any of the communication ports.
15. Each communication port shall be configurable with a unique station number when used with the standard protocol.

16. Any port running the standard communications protocol shall allow for programming via local or remote communications.

D. Network Protocols

1. Ethernet Network protocols shall consist of IP, ARP, TCP, TFTP, UDP and ICMP

E. Other Protocols

1 Rockwell (Allen Bradley) DF1 Protocol Half / Full Duplex modes BCC / CRC error check modes .

F. Operating System:

The software shall be based on a multi-tasking executive system optimized for real-time environment.

G. Programming Software:

1. The programming software shall allow downloading of Relay Ladder Logic and/or C/C++ programs from within one package. The software shall allow the user to develop and download the application and system configuration over the communication network via radios, leased and dial-up lines.

2. The RTU shall allow Ladder and C/C++ applications to run concurrently. Any failure in the Ladder application shall not affect other applications running under C.

3. The Relay Ladder Logic shall include the following functions:

- PID feedback control
- Data logging function with time & date
- Modem dialing and control
- Timers, counters, mathematical functions, memory functions
- Standard Ladder Logic functions such as coils and contacts
- Boolean logic functions
- Bit transfer functions
- Block transfer functions
- Scaling function
- Totaling function
- Flow function

4. On-line monitoring of Relay Ladder Logic power flow shall be included to facilitate start-up and debugging of programs.

5. Relay Ladder Logic program shall be up to 12K words in size, with no fixed limit on the number of networks.

6. The programming software shall support on-line monitoring and forcing of any register in the protocol database when utilizing the built-in protocol. Forcing shall write a value to the register and prevent modification of the register content by the communication protocol or the application software. A global command to remove all forcing must be included.

7. In addition to forcing, the software shall be capable of writing a value to any register in the protocol database but continue to allow the protocol or application software to modify the

contents of the register.

8. The controller shall be capable of processing up to 32 PID loops with individual execution time bases from 0.1 to 25.5 seconds.
9. C/C++ tools shall support the following functions:
 - Database functions
 - Modem dial-up functions
 - PID functions
 - System functions
 - Protocol functions
10. When downloading C programs, the communication message size must be configurable to a minimum of 26 bytes and a maximum of 256 bytes.
11. The software communication settings must allow configurable number of retries in addition to message time-out of up to 99 seconds.
12. The unit must also support IEC 61131-3 programming using Sequential Function Chart (SFC), Functional Block Diagram (FBD), Ladder Diagram (LD), Structured Text (ST), Instruction List (IL), Flow Chart (FC) languages using a separate programming tools.

H. Data Logging Functionality

1. The Software and hardware shall support time stamped data logging with up to 15 separate log functions with 8 elements per log or 128 different variables.
2. Data shall be selectable by Modbus registers in single bit, 16bit, 32bit and floating point registers.
3. Update frequency shall be selectable by the user and can vary from .1 seconds to 999 months.
4. The controller shall have a minimum of 454,000 words available for data logging.
5. Configuration of the data log function shall be made through the ladder logic programming software or IEC61131-3 programming software.
6. Logs are triggered by timers or process event.
7. All data is retrievable as a .csv file for customers use in Excel, Access, or customers HMI software. Data could be uploaded to a PC using direct serial connection, leased telephone lines, radio or dial-up modem.

2.11 PROGRAMMABLE AUTOMATION CONTROLLER (PAC) SYSTEM

- A. As an option to the PLC based controller, the Manufacture may provide a PAC based controller system. The PAC system shall meet the following technical specification and shall meet all functional requirements under paragraph 1.09 Basic Description of Operation.
- B. The following requirements shall be standard minimum features in the PAC systems approved for this project. All the following features must be present in the PAC device to be compliant.

1. The control system shall consist of integrated hardware and software that can be configured to perform control, monitoring, data acquisition, operator interface, and motion control tasks. All system components shall share a common database to improve programming efficiency and reduce errors.
2. Input/output points and variables shall be referenced by user-created tag names. Abbreviated references to I/O points are not acceptable. A minimum length of 32 characters shall be provided for all tag names.
3. Background program download, allowing a new control program to be downloaded while the current program is running, must be available. The background download feature shall have the ability to switch to the new program, as well as back to the old.
4. Standard software that facilitates a direct connection of controller data to a database such as Microsoft SQL Server, MySQL, or Microsoft Access shall be available. The control program should have the ability to be encrypted in the controller, to protect intellectual property. The controller must have the ability to log and store data locally, with a minimum of 2 megabytes of memory available for this purpose. The controller must have one MicroSD memory card slot that supports commercially available MircoSD cards of up to two gigabytes, for additional local data logging. Multitasking shall be employed to permit the simultaneous execution of multiple tasks. Primary communication shall use Ethernet. The controller must support both wired Ethernet as well as 802.11 a, b, & g wireless Ethernet. The controller must support the following common industrial Ethernet protocols: Modbus/TCP and EtherNet/IP. The controller must support the following common industrial serial protocols: Modbus (RTU & ASCII), Profibus DP, DF1, & DNP 3.0. The controller must support the following Internet protocols: TCP/IP, UDP, SNMP, SMTP, PPP, & FTP. It shall be possible to update controller firmware via the Ethernet network. The controller shall have dual, independent Ethernet ports. The controller shall have a minimum of one serial (RS-232) port. The controller shall have the ability to store data locally and be accessible via FTP. Controller shall contain a real-time clock.
5. Controller redundancy shall be standard. Either of the redundant controllers shall have the ability to play the role of active controller or backup controller. Either of the redundant controllers shall have the ability to switch its role in the redundancy scheme at any time. No special cables shall be required (standard CAT-5 and RS-485). No special redundancy controllers shall be required. Standard controllers shall have the ability to be configured for redundancy. A stand-alone arbiter processor shall be used to coordinate redundant controller operation. No special software shall be required. Standard control programming software shall include redundancy configuration option.
6. The ability to have specific data tagged for redundancy is required.
7. The I/O processor must support both wired Ethernet as well as 802.11 a, b & g wireless Ethernet. Any combination of analog, digital, or special-purpose connections shall be permitted. Analog information shall be available in scaled engineering units. I/O mounting racks shall be available in 4-, 8-, 12-, and 16-slot configurations and should be a common platform for all I/O processors and remote I/O communication units. Remote I/O units or processors should have the ability to process event reactions and PID functions locally, independent of the controller. Digital input and output modules shall have a minimum of 4 inputs or 4 outputs per module. High density digital input and digital output modules of up to 32 points shall be available. Analog input modules shall have a minimum of 4 channels per module. Serial modules should be available for RS-232, RS-422/RS-485. The following specialty modules shall be available, respectively: single & three-phase power monitoring (monitors AC RMS voltage or current, calculates true power & volt-amps), unconditioned pH/ORP signals (-.5 to .5 or -1.0 to 1.0 Volts), and unconditioned load cell input signals (2-4 mV/V, 10 VDC excitation). All I/O shall be optically isolated.
- 8.

2.12 LAPTOP COMPUTER FOR FIELD PROGRAMMING

Two (2) laptop computers shall be furnished for the purposes of field programming each PLC. The systems integrator shall load all required software and program the initial set points as determined from the existing equipment settings. The laptop computer shall connect to the PLC via Ethernet connection. As a minimum the laptop computer shall meet the requirements of HP Pavilion dv4t series and configured as follows: Windows 7 Home Premium, 2nd generation Intel Core i3-2330M 2.2 GHz, 3 MB L3 cache, 802.11 b/g/n WLAN

In lieu of the laptop computers, the Manufacturer may provide two (2) plug in style 12" in size LCD terminal interface programming modules to enable control of set point and alarm programming.

2.13 PILOT LIGHTS

Pilot lights shall be provided to indicate the status of the following items:

- Pump run
- High Level Alarm
- Low Level Alarm
- Seal Failure (one for each pump)
- Motor Over temperature (one for each pump)
- Float Backup System Active

2.14 PRESSURE TRANSMITTER

High performance pressure transmitter shall be rugged all stainless steel construction with silicon technology. Instrument shall be mini din connection style OMEGA PX319-050GI with 4-20mA output or equal as approved by the Engineer. Tap connection shall be 1/4"-18 NPT. Brass or stainless steel adapters and fluid filled stainless steel diaphragm seals shall be used to connect to existing tapped hole in the discharge piping.

Manufacturer shall provide an LCD display in the panel to indicate pressure in pounds per square inch as 00.0 psi.

2.15 SELECTOR SWITCHES

A "Hand-Off-Auto", three-position selector switch shall be provided for each pump. In "Hand" mode, the pumps shall be operate manually, regardless of the wet well level and seal failure status. In "Auto" mode, the pumps shall operate automatically on either the primary level control system via the PLC or on the float backup system.

A three-position selector switch shall be provided to select the alternation sequence. The available alternation sequences shall be "1-2, Auto, and 2-1".

A two-position selector switch shall be provided to select "Auto" or "Float Backup" mode.

2.16 MOTOR OVERTEMPERATURE / SEAL FAILURE PROTECTION

- A. Motor Over-temperature: The control panel shall include motor over temperature protection relays for each pump. When an over-temperature protection relay is engaged, the corresponding pump shall be locked out from operation in "Auto" mode.
- B. Seal Failure: A seal failure relay shall be provided for each pump. The seal failure relay shall detect the presence of moisture in the pump based on a change in resistance. The seal failure relays shall

have an adjustable sensitivity from 1 – 100,000 Ω . The seal failure relay shall include an LED for status indication.

2.17 ELAPSED TIME METERS

An elapsed time meter measuring hours and tenths of hours of operation up to 99999.9 hours shall be furnished for each pump motor indicated. This shall be a 120 VAC device operating from the control voltage by an auxiliary contact of the motor starter or other run contact.

2.18 SUBMERSIBLE LEVEL TRANSMITTER AND PANEL MOUNTED INDICATOR

The wet well level shall be measured by a hydrostatic submersible level transmitter. The level sensor / transmitter shall be constructed of 316 stainless steel with stainless steel diaphragm. Body diameter shall be 1.25" with a 2.5" non-fouling process diaphragm. The unit shall be specially designed for sewage for service. The transmitter sensor shall be solid state, piezo resistive type, protected from the process media by the diaphragm and silicon oil fill fluid. Electrical output shall be true two-wire 4-20 mA requiring 15-45 volts DC excitation. Accuracy shall exceed + .5% of FS and both zero and span adjustments shall be available for field calibration. Available ranges shall include 0-5/0-115 FT WC. Electrical connection shall be through a custom manufactured heavy wall polyurethane jacketed cable which does not employ a vent tube through which moisture can ingress the electrical housing. The transmitter manufacturer shall offer several mounting options including conduit adaptors, pipe mounting brackets and cable suspension brackets. Level transmitter shall be Sigma Controls Model 6100, or approved equal.

Each submersible level transmitter shall be provided with an intrinsically safe barrier. Intrinsically safe barriers shall be UL listed.

A panel mounted display instrument shall be installed to indicate the water level in the wet well as measured in inches from the bottom of the transducer. The instrument shall be either circular or linear and be calibrated in increments of not exceeding .1 ft.

2.19 FLOAT BACKUP SYSTEM

As described in the Description of Operation, a float backup system shall automatically engage on a high level alarm float and provide automatic operation of the pumps in the event of a failure of either the PLC or the submersible level transmitter. The float backup system shall include a pushbutton reset.

All float switches shall be provided with adequate length of cable. Required cable lengths shall be verified by the Manufacturer. All float switches shall be provided with intrinsically safe barriers. Float switches shall be attached to a story pole to facilitate the installation and maintenance of the float system.

2.20 UNINTERRUPTIBLE POWER SUPPLY (UPS)

An uninterruptible power supply (UPS) shall be provided within the enclosure. The UPS shall be sized to power the PLC for a minimum of 15 minutes. The UPS shall be UL listed.

2.21 FACTORY TESTING

The systems integrator shall factory test each control panel. Prior to factory testing, a factory test procedure shall be submitted to the Engineer for approval. The Owner and the Engineer reserve the right to witness all factory testing. Notice of factory testing shall be provided at least two (2) weeks

prior to factory testing. Equipment shall not be shipped from the factory without written approval from the Owner and/or the Engineer.

2.22 STARTUP AND TRAINING

Startup and training will be provided under Contract 2 by the Manufacturer engaged under the payment terms noted under Alternate Bid Item 1A of the Bid Tabulation. The field service technician shall be a direct employee of the Manufacturer.

2.23 OPERATION AND MAINTENANCE MANUALS AND RECORD DRAWINGS

The systems integrator shall provide a complete Operation and Maintenance Manual for each control panel. Each manual shall include the following items:

- Description of operation
- As-built drawing of enclosure
built control panel layout
- As-built elementary wiring diagrams indicating all connections within the control panel as well as all field connections
- Bill of material
- Operation and maintenance instructions for all major components and accessories

2.25 SHIPPING

The Manufacturer shall securely package and mount equipment on wood pallets for shipping. Equipment shall include lift lugs for proper and safe lifting and handling of the equipment. Manufacturer shall utilize industry recognized shippers and shall provide shipping insurance on the equipment in the event of damage.

2.24 WARRANTY

The manufacturer shall warrant the enclosure, control panel, instruments, and accessories defined above against all defects in material and workmanship for a period of three years.

END OF SECTION

LINCOLN, RI SUBMERSIBLE PUMP STATION REHABILITATION PROJECT

EXISTING PUMP EQUIPMENT INFORMATION

Station ID	Station Name	Pump Information						
		Manuf	Type	No. of Pumps	Model	Hp	Voltage	Phase
1	Lori Ellen Dr	ABS	Grinder	2	M50/2W	5	230	1
2	not in program	-	-		-	-	-	-
3	Paddock Road	ABS	Grinder	2	M50/2W	5	230	1
4	Jason Drive	ABS	Grinder	2	M50/2W	5	230	1
5	Sables Way	ABS	Grinder	2	M50/2W	5	230	1
6	Rollingwood Drive	ABS	Grinder	2	M50/2W	5	230	1
7	not in program	-	-		-	-	-	-
8	Woodridge/Barbette Drive	ABS	Grinder	2	M25/2W	3	230	1
9	Davies	ABS	Submersible	2	AF4044	7	120/208	3
10	Whitney Drive	ABS	Grinder	2	M25/2W	3	230	1
11	Belmont Drive	ABS	Grinder	2	M25/2W	3	230	1
12	Heidi Road	ABS	Grinder	2	M50/2W	5	230	1
13	Old Pike	ABS	Grinder	2	M25/2W	3	230	1
14	Middle Street	ABS	Grinder	2	M25/2W	3	230	1
15	Mount Avenue	ABS	Grinder	2	M25/2W	3	230	1
16	Newland Avenue	ABS	Grinder	2	M25/2W	3	230	1
17	Hillside Avenue	ABS	Grinder	2	M25/2W	3	230	1
18	Edgehill Avenue	ABS	Grinder	2	M25/2W	3	230	1
19	not in program	-	-		-	-	-	-
20	Arlington Drive	ABS	Grinder	2	M25/2W	3	230	1
21	not in program	-	-		-	-	-	-
22	Ashley Drive	ABS	Grinder	2	M25/2W	3	230	1
23	not in program	-	-		-	-	-	-
24	Cider Mill Dr.	ABS	Grinder	2	M25/2W	3	230	1
25	Applewood Drive	ABS	Grinder	2	M25/2W	3	230	1
26	not in program	-	-		-	-	-	-
27	Great Road North	ABS	Grinder	2	M25/2W	3	230	1
28	Lincoln Center Blvd	ABS	Grinder	2	M25/2W	3	230	1
29	not in program	-	-		-	-	-	-
30	Oak Hill / Albion Road	ABS	Grinder	2	M50/2W	5	230	1
31	Eagle Nest Drive	ABS	Grinder	2	M50/2W	5	230	1
32	Birchwood Drive	ABS	Grinder	2	M50/2W	5	230	1

Lincoln, RI Wastewater Pump Station Rehabilitation Program
 Submersible Pump Station enclosure data Nov 11, 2011

Concrete Base

Station ID	Station Name	Length Inches	Width Inches	Exposure above grade inches
32	Birchwood	66.5	30.5	3.5
31	Eagle Nest	87.25	39.5	3.0
30	Oak Hill (Albion)	88.25	39.0	3.0
28	Lin. Center Blvd	65.5	30.0	Buried
27	Great Road N.	66.0	30.0	2.5
25	Applewood	66.0	30.5	At grade
22	Ashley	72.0	36.0	8.0
20	Arlington	66.0	30.0	At grade
18	Edgehill	66.0	30.0	At grade
17	Hillside	66.0	30.0	At grade
16	Newland	66.0	30.0	At grade
15	Mount	66.0	30.0	Covered by asphalt- dimensions assumed
14	Middle	66.0	30.0	Buried
4	Jason	66.5	30.5	2.0
3	Paddock	66.0	30.0	Covered by asphalt- dimensions assumed
1	Lori Ellen	66.0	30.0	2.0
8	Woodridge (Barbette)	72.5	36.0	grade

SS Enclosure – opening dimensions

Station ID	Station Name	Length Inches	Height Inches	Depth Inches
5	Sables Way	57.5	69	12
9	Davies School	69.25	68.0	21.0
6	Rollingwood/Wingate	57.5	69	12
10	Whitney	57.5	69	12
11	Belmont	57.5	69	12
12	Heidi	57.5	69	12
13	Old Pike	57.5	69	12
21	Butterfly Estates	57.5	69	12
24	Cider Mill	57.5	69	12