



3501 Kishwaukee Street
P.O. Box 7480
Rockford, IL 61126-7480
815-387-7660
815-387-7665 (FAX)

Donald Massier, President
Elmer Jones, Vice President
Rick Pollack, Clerk/Treasurer
Ben Bernstein, Trustee
John Sweeney, Trustee
Timothy S. Hanson, District Director

Bid Doc. No. 19-412

Invitation to Bid

VFD Procurement for Cherry Valley Lift Station Pump Replacement Capital Project No. 1911

June 27, 2019

Name of Bidding Firm: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

Email: _____

Bid Opening Time and Date: 10:00 a.m., Friday, July 12, 2019

Any bid delivered after the opening time and date will not be accepted.

Bid Deposit/Bid Bond: 10%

Prevailing Wage: YES

Performance Bond: NO

Please mark the return sealed envelope:

1. Bid Opening Date and Time
2. Title of Job
3. Bid Number

SEND BIDS TO:

Rock River Water Reclamation District
Attn: Christopher T. Baer, Engineering Manager
3501 Kishwaukee Street
Rockford, IL 61109

Bids will not be accepted by fax or email.

If the Illinois Department of Human Rights registration number has not been obtained, this number must be provided within five (5) business days after the date of bid opening.

Bid results are available after the contract is awarded at the Regular Meeting of the Board of Trustees, held on the fourth Monday of the month. Please call 815-387-7660 or visit www.rrwrd.dst.il.us for more information.

I - Notice

VFD Procurement for Cherry Valley Lift Station Pump Replacement Capital Project No. 1911

The Rock River Water Reclamation District (District) will receive signed, sealed bids for VFD Procurement for Cherry Valley Lift Station Pump Replacement, Capital Project No. 1911 at the District's offices, 3501 Kishwaukee Street, Rockford, Illinois, until 10:00 a.m., Friday, July 12, 2019 at which time and place, bids will be publicly opened and read aloud.

The scope of this bid includes the supply, inspection, and testing of two (2) identical, separately enclosed, preassembled, variable frequency drives (VFD's) with bypass and appurtenances, as indicated and specified.

No bid shall be withdrawn after the opening of bids without consent of the District for a period of sixty (60) days after the scheduled time of receiving bids.

Copies of the Invitation to Bid for review purposes only are available on the District's website, www.rrwrd.dst.il.us. Bid documents for submittal are available by contacting the District Engineering Department at 815.387.7660.

A Mandatory Pre-Bid Meeting will be held at the Cherry Valley Lift Station, 4020 Barley Ridge Trail, Cherry Valley IL on Wednesday, July 3, 2019 at 10:00 a.m. Bids will not be accepted from Equipment Manufacturers who are not in attendance or do not have a designated representative in attendance.

The District will confirm any award decision in writing, to the successful bidder. Within ten (10) days of the Notice of Award, the Contractor shall submit an executed Contract and acceptable insurance documentation per the Invitation to Bid. Upon receipt of acceptable insurance documents, the District will issue the Notice to Proceed (NTP). Shop drawings shall be submitted, reviewed, resubmitted, and approved within four (4) weeks of the date of the NTP. This schedule shall allow one (1) week for each District review. Equipment shall be delivered to the site within fourteen (14) weeks from the date of the NTP. Failure to deliver within the indicated time shall result in liquidated damages of \$300 per calendar day until delivery is completed.

By: Chris Black
Chris Black, Business Manager

II - General Specifications and Instructions

VFD Procurement for Cherry Valley Lift Station Pump Replacement Capital Project No. 1911

2.1 Bid Preparation

The bidder shall submit his bid on the forms the District provides in this document. **The bidder shall complete all applicable blanks.** He may submit additional information as he believes necessary on his stationery, under signature of the authorized representative who completes this document's forms.

If this Invitation to Bid contains inconsistencies between sections, Section III - Detailed Specifications shall supersede Section II - General Specifications, which shall supersede Section I - Notice. **No warranty is made or implied as to information contained in these specifications.**

An authorized officer or individual must sign the bid. Authorized signature must be the individual owner of a proprietorship, a general partner of a partnership, or the corporation officer who is authorized to sign for a firm and whose title is affixed.

All prices and notations shall be in ink or typewritten. The bidder may cross out mistakes and type corrections adjacent to the point of error. The person who signs the bid shall initial such corrections, in ink. **If the District finds a bidder's entry to be illegible, it may, at its sole discretion, reject the bid.**

2.2 Submission of Bids

The District **will not** receive bids in electronic format or by facsimile. The bidder shall return his bid in a sealed envelope, clearly marked as "Bid No. 19-412; VFD Procurement for Cherry Valley Lift Station Pump Replacement, Capital Project No. 1911." **The District cannot ensure that the sealed bid will not be prematurely opened if the bid envelope is not clearly labeled.**

Mailing labels should be addressed to:

Rock River Water Reclamation District
Attn: Christopher T. Baer, Engineering Manager
P.O. Box 7480
Rockford, IL 61126-7480

Bids sent via parcel delivery service should be addressed to:

Rock River Water Reclamation District
Attn: Christopher T. Baer, Engineering Manager
3501 Kishwaukee Street
Rockford, IL 61109

Hand-delivered bids shall be deposited with the Main Entrance (Billing Window) Receptionist, 3501 Kishwaukee Street, Rockford, IL 61109 between the hours of 8:00 A.M. and 4:30 P.M.

2.3 Illinois Department of Human Rights Registration Number

All bidders inside and outside of Illinois must provide an Illinois Department of Human Rights Registration Number at the time bids are due. If the number has not been obtained, it must be provided within five (5) business days after the date bids are due. This number shall be written or typed on the line in the Fair Employment Affidavit of Compliance (included in this document). The following link may be used to access the website where the number can be obtained: www.illinois.gov/dhr/PublicContracts/Pages/Vendor_On_Line_Renewal.aspx

2.4 Taxes

This District is exempt, by law, from paying bidder Federal Excise Tax and Illinois Retailers' Occupational Tax. Therefore, the bidder shall exclude those taxes from his bid. The District's tax exemption number is E9992-3696-07. The bidder shall include all applicable taxes in his bid price.

2.5 Withdrawal of Bids

At any time prior to the scheduled bid opening, the bidder may withdraw his bid. In order to do so, he shall submit a written request to Chris Black, District Business Manager.

2.6 Laws and Regulations

The bidder who is awarded the Contract shall comply with all laws of the United States of America, the State of Illinois, and all lawful regulations of the District and the respective cities and villages in which the professional service, material or equipment supplied is to be performed respecting labor and compensation and all other applicable statutes, ordinances, rules and regulations and having the force of the law.

A. Steel Products Procurement Act

Public Act 83-1030 entitled "Steel Products Procurement Act" requires that steel products used or supplied in performance of this Contract or subcontract shall be manufactured or produced in the United States with three (3) exceptions.

The provisions of this Section shall not apply:

1. Where the Contract involves an expenditure of less than \$500.
2. Where the executive head of the public agency certifies in writing that (a) the specified products are not manufactured or produced in the United States in sufficient quantities to meet the agency's requirements, or (b) obtaining the specified products, manufactured or produced in the United States would increase the cost of the Contract by more than ten percent (10%).
3. When its application is not in the public interest.

2.7 Terms

A. Payments to the Successful Bidder. If the District receives an acceptable invoice for conforming materials or services prior to the fifth day of the month, the District shall issue payment before the fifth day of the succeeding month. If received on or after the fifth day of the month, payment will be issued the following month.

B. Default. In case of default, the District will procure the materials or services described in this Invitation to Bid from other sources. The District shall hold the defaulting successful bidder responsible for any excess cost incurred. The defaulting successful bidder shall make such payment no more than sixty (60) calendar days after the District notifies him, in writing, of such an occurrence.

C. Delivery Hours. Unless otherwise specified, all items must be delivered to the Cherry Valley Lift Station, 4020 Barley Ridge Trail, Cherry Valley, Illinois, Monday through Friday, between the hours of 7:30 A.M. and 3:00 P.M., excluding holidays. Contact Warren Adam at 815.871.0787 on the day of delivery.

In the unlikely event that the District is picketed by its employees or by a third party, or if any labor-management dispute between the District and its employees or third parties becomes known to the successful bidder, then in such event and during the course of any such picketing or labor-management dispute, the successful bidder shall continue to carry out the terms and conditions of this Contract as if such pickets were not present or such labor-management dispute did not exist.

Time of delivery is part of the District's consideration of each bid.

D. F.O.B. Point and Shipping Charges. All prices shall be quoted F.O.B. destination, Cherry Valley Lift Station, 4020 Barley Ridge Trail, Cherry Valley, Illinois, 61016. All shipping, handling and freight charges must be included in the bid amount.

E. Use of District Name Prohibited. In the absence of the District's written permission, the successful bidder shall not use the District's name in any form or medium of public advertising.

2.8 Quantities Estimated Only

The estimated quantities of the various items of work and materials, as set forth in the bid form, are approximate only and are given solely to be used as a uniform basis for the comparison of bids. The quantities actually required to complete the Contract work may be less or more than so estimated, and if awarded a Contract for the work specified, the Contractor further agrees that he will not make any claim for damages or for loss of profits or for an extension of time because of a difference between the quantities of the various classes of work assumed for comparison of bids and quantities of work performed.

2.9 Investigation

It shall be the responsibility of the bidder to make any and all investigations necessary to become thoroughly informed of what is required and specified in the bid documents. No plea of ignorance by the bidder of conditions that exist or that may hereafter exist as a result of failure or omission on the part of the bidder to make necessary examinations and investigations will be accepted as a basis for varying the requirements of the Contract or for the approval of additional compensation to the bidder.

2.10 Addenda

If the District issues written addenda, such addenda shall become part of the Contract documents. The District will distribute the addenda:

- A. Not less than three (3) working days prior to the bid opening date;
- B. Via mail, email, or facsimile transmission;
- C. To each recipient of the specifications, at either the:
 - 1. Address to which the District mailed the original bid document;
 - 2. Corrected address the prospective bidder subsequently furnished; or
 - 3. Email address prospective bidder furnished; or
 - 4. Facsimile number the prospective bidder sent the District.

In the absence of the prospective bidder's written notice of his email address or facsimile number, the District will provide addenda via mail.

A bidder that does not receive the District's addenda, and who has previously submitted a bid, shall not be relieved from any obligation in the bid he submitted.

2.11 Contract Form

No more than ten (10) business days following the Contract award, the successful bidder shall submit a completed Contract Form to RRWRD, Attn: Christopher T. Baer, Engineering Manager. The Contract Form is part of this Invitation to Bid. If the successful bidder fails to complete the Contract Form within the specified time, he shall be in material default.

2.12 Contract Termination

- A. Bidder's Unacceptable Performance.** If the successful bidder fails to perform services or provide materials in conformity with this Invitation to Bid, the District shall notify him in writing. If the successful bidder fails to correct the performance deficiency to the District's satisfaction within five (5) working days after he receives the District's notice, he shall be in default. If the same performance deficiency recurs despite the District's notification and the successful bidder's temporary correction, the successful bidder shall likewise be in default. The District may, at its sole discretion, terminate the VFD Procurement for Cherry Valley Lift Station Pump Replacement, Capital Project No. 1911 Contract with the defaulting successful bidder, and remedy the matter under provisions set forth in Section 2.7B of this Invitation to Bid.
- B. District's Action Following Contract Termination.** If the Contract is terminated, the District may, at its sole option:
 - 1. Request new VFD Procurement for Cherry Valley Lift Station Pump Replacement, Capital Project No. 1911 bids or
 - 2. Designate the next-low bidder to perform the VFD Procurement for Cherry Valley Lift Station Pump Replacement, Capital Project No. 1911 Contract, provided that said next-low bidder agrees to his original bid terms.

The District may repeat this option until it obtains an acceptable VFD Procurement for Cherry Valley Lift Station Pump Replacement, Capital Project No. 1911 Contract.

2.13 “No Bid” Response Form

In the event you elect not to bid, please fill out and return the attached “No Bid” form.

2.14 Indemnification Clause

Successful respondent/contractor shall protect, indemnify, hold and save harmless and defend the District, its officers, officials, employees, volunteers, and agents against any and all claims, costs, causes, actions and expenses, including but not limited to attorney's fees incurred by reason of a lawsuit or claim for compensation arising in favor of any person, including the employees, officers, independent contractors, or subcontractors of the successful respondent/contractor or District, on account of personal injuries or death, or damages to property occurring, growing out of, incident to, or resulting directly or indirectly from the performance by the successful respondent/contractor or subcontractor, whether such loss, damage, injury, or liability is contributed to by the negligence of the District or by premises themselves or any equipment thereon whether latent or patent, or from other causes whatsoever, except that the successful respondent/contractor shall have no liability for damages or the costs incident thereto caused by the sole negligence of the District.

The indemnification shall not be subject to a limitation on amount or type of damages payable by or for the successful respondent/contractor or its subcontractor under any employee benefits act including, but not limited, to the Workers' Compensation Act.

No inspection by the District, its employees, or agents shall be deemed a waiver by the District of full compliance with the requirements of the Contract. This indemnification shall not be limited by the required minimum insurance coverage in the Contract.

2.15 Force Majeure

The obligations of either the District or the successful bidder shall be suspended during the time as such party is prevented from complying therewith in whole or in part because of any cause, except financial, beyond the reasonable control of such party. In the event of either the District or the successful bidder being rendered unable wholly or in part by force majeure to carry out its obligations under the Contract, other than to make payments due, it is agreed that on such party giving notice and full particulars of such force majeure in writing to the other party as soon as possible after the occurrence of the cause relied on, then the obligations of the parties insofar as they are affected by such force majeure shall be suspended during the continuance of any inability so caused but for no longer period, and such cause shall as far as possible be remedied with all reasonable dispatch.

2.16 Insurance

A. The successful respondent/contractor, for the duration of the Contract, shall maintain the following:

General Liability: \$1,000,000 combined single limit per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply

separately to this project or the general aggregate limit shall be twice the required occurrence limit.

Auto Liability: \$1,000,000 combined single limit per accident for bodily injury and property damage including coverages for owned, hired or non-owned vehicles, as applicable.

Workers' Compensation and Employers' Liability: Workers' Compensation limits as required by statute and Employers' Liability limits of \$500,000 per accident and \$500,000 per disease.

Umbrella: \$2,000,000 per occurrence/aggregate.

The policies shall contain, or be endorsed to afford Contractual Liability coverages for the following provisions in the General Liability and Automobile Liability coverages:

1. The District, its officers, officials, employees, and volunteers shall be covered as additional insureds as respects liability arising out of activities performed by or on insured's general supervision of the successful respondent/contractor, products and completed operations of the successful respondent/contractor, premises owned, occupied or used by the successful respondent/contractor, or automobiles owned, leased, hired, or borrowed by the successful respondent/contractor. The coverage shall contain no special limitations on the scope of protection afforded to the District, its officers, officials, employees, volunteers, or agents.
2. The successful respondent's/contractor's insurance coverage shall be primary insurance as respects the District, its officers, officials, employees, volunteers, and agents. Any insurance or self-insurance maintained by the District, its officers, official employees, volunteers, or agents shall be in excess of the successful respondent's/contractor's insurance and shall not contribute with it.
3. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the District, its officers, officials, employees, volunteers, or agents.

The successful respondent's/contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

B. Proof of Insurance – Certificate of Insurance. No more than ten (10) calendar days subsequent to the District's issuance of an award letter and no later than thirty (30) days before commencement to work, the successful respondent/contractor shall provide documentation including a Certificate of Insurance and primary, non-contributory additional insured endorsements for general and auto liability to prove that it has obtained all required insurance. The District shall be the sole judge as to the acceptability of any such proof.

C. Correction of Successful Bidder's Insurance Deficiencies. If the District determines that the successful bidder's insurance or documentation does not conform to these specifications, the District shall inform said bidder of the non-conformity. If said bidder fails to provide conforming insurance or documentation within five calendar days of the District's notice, he shall be in default.

D. Best's Ratings.

1. Alphabetical Rating. For purposes of this Request for Bids, "insurer" shall mean any surety, insurance carrier, or other organization which proposes to provide an insurance policy or bond for the successful respondent/contractor. No insurer or surety rated lower than "A-," Excellent, in the current Best's Key Rating Guide shall be acceptable to the District.

2. Financial Size Rating. Provided an insurer's alphabetical rating is satisfactory, the District will examine said insurer's financial size rating.

- a. If Best classifies the insurer XII or larger, said insurer shall be acceptable to the District.
- b. If Best classifies the insurer as smaller than XII, but larger than VI, said insurer shall be submitted to the District's Business Manager and/or the District's insurance consultant for review.

Financial Size ratings less than VII are not acceptable and will disqualify the respondent/contractor.

E. Suitability of Insurance. The District shall be the sole judge of whether an insurer's rating is satisfactory. The District's decision shall be final and the District's bidding procedures contain no appeal provision.

2.17 Responsive/Responsible Bidder

A. Evaluation of Responsiveness. The responsiveness of bidders will be judged on the basis of the completeness of the bid submitted. To be responsive, a Bid must be submitted on the forms provided as part of the Bid Documents and comply with all the requirements of the Invitation to Bid.

B. Evaluation of Responsibility. To be judged as responsible, the bidder shall:

1. Have adequate financial resources for performance, the necessary experience, organization, technical qualifications, and facilities, or a firm commitment to obtain such by subcontracts;
2. Be able to comply with the required completion schedule for the project;
3. Have a satisfactory record of integrity, judgment, and performance, including, in particular, any prior performance on contracts from the District;
4. Have an adequate financial management system and audit procedures, that provide efficient and effective accountability and control of all property, funds, and assets;
5. Conform to the civil rights, equal employment opportunity and labor law requirements of the Bid Documents.

III - Detailed Specifications

VFD Procurement for Cherry Valley Lift Station Pump Replacement Capital Project No. 1911

1 General Requirements

1.1 General

This section contains detailed specifications relating to proposal items. The work to be done under each item is discussed along with units for payment and measurement for payment. However, the descriptions given do not necessarily outline all the work to be done under any item. In addition, work shall conform to the *Standard Specifications for Water and Sewer Main Construction in Illinois*, current edition, and Rock River Water Reclamation District *General Provisions and Technical Specifications for Sanitary Sewer Construction*.

Throughout these specifications, the term “Owner”, “District”, and “Engineer” shall be synonymous, and the terms “Manufacturer”, “Vendor”, “Supplier”, and “Contractor” shall be synonymous.

In case of apparent contradictions between *Section III - Detailed Specifications* and the *General Provisions and Technical Specifications for Sanitary Sewer Construction*, these *Detailed Specifications* shall govern.

Manufacturer shall implicitly warrant that all products or product components provided are suitable and appropriate for the intended use and that they are free from all material, design, or workmanship defects. Said warranty shall inure to the benefit of the District. The foregoing shall apply to all products or product components, whether fabricated or constructed per contract documents or provided by an outside source.

After the award of the Contract and prior to starting work, the Manufacturer shall submit to the Engineer a satisfactory delivery schedule or critical path schedule which will show how the Manufacturer proposes to deliver the VFD's and appurtenances by the completion date specified in this Contract.

1.2 Submittals

The Manufacturer shall submit to the Engineer the items under ‘Required Submittals’ of each special provision prior to beginning any work. The Manufacturer shall perform the following:

1. Review each submittal.
2. Verify field dimensions.
3. Verify compliance with Contract documents.
4. Stamp submittals to certify the Manufacturer's review/approval.
5. Transmit reviewed submittals to the Engineer for approval.

The Manufacturer shall submit a list of all materials requiring the Engineer's color selection. The list shall include the manufacturer name and model number/name for each item. The Engineer may require additional color samples.

The Manufacturer shall allow a minimum of one (1) week for submittal review by the Engineer. It shall be the Engineer's prerogative to delay review of inter-related submittals until all components are received. No Contract extension will be approved due to the Manufacturer's failure to provide submittals with sufficient time for Engineer to perform a thorough review.

The Engineer's approval of a submittal shall not be construed as an order for additional, extra, or differing work nor as guarantee of the accuracy of information or the effectiveness of the products provided in the submittal.

No manufacturing or fabrication by order of the Manufacturer shall occur until all submittals have been reviewed and approved by the Engineer.

When the Contract Documents call for operations to be performed in accordance with the manufactures' instructions, the manufacturers' instructions shall also be considered required submittals.

1.3 Mandatory Pre-Bid Meeting

A Mandatory Pre-Bid Meeting will be held at the Cherry Valley Lift Station, 4020 Barley Ridge Trail, Cherry Valley IL on Wednesday, July 3, 2019 at 10:00 a.m. Bids will not be accepted from Equipment Manufacturers who are not in attendance or do not have a designated representative in attendance.

2 Variable Frequency Drives (VFD's)

2.1 General

Equipment manufacturer shall provide two (2) VFD's and appurtenances as specified in Section 16483 – Variable Frequency Drives. See Section VIII.

The proposed VFD model must be indicated on the Proposal form. Failure to submit this information will be grounds for rejection of the bid.

2.2 Required Submittals

1. One (1) paper copy and one (1) electronic version of shop drawing information shall be submitted within four (4) weeks of the date of the NTP. See Section VIII for details.
2. Two (2) paper copies and one (1) electronic version of operation and maintenance data shall be submitted prior to equipment delivery. See Section VIII for details.
3. One (1) paper copy and one (1) electronic version of Load-Current and List of Settings of Adjustment Overload Relays (Section VIII 1.4C), Harmonic Analysis Study and Report (Section VIII 1.4D), source quality control reports (Section VIII 1.4E), and field quality-control reports (Section VIII 1.4F). All items must be submitted and approved prior to project close-out.
4. One (1) electronic AutoCAD drawing of the proposed equipment.

2.3 Delivery, Storage, and Handling

1. Deliver materials to the site in such a manner as to protect the materials from shipping and handling damage. Provide materials on factory provided shipping skids and lifting lugs if

required for handling. Materials capable of sustaining damage by the elements should be packaged in such a manner that they can withstand short-term exposure to the elements during transportation.

2. Bid shall include costs for delivery of equipment to the Cherry Valley Lift Station, 4020 Barley Ridge Trail, Cherry Valley IL 61016. The Manufacturer will coordinate equipment delivery with Installation Contractor (to be determined).
3. All deliveries shall include proper unloading and handling of the equipment at the required location.

2.4 Warranty

Provide a minimum six (6) year warranty on all materials. Warranty period shall start upon equipment installation and successful start-up.

2.5 Start-Up and Training

Provide start-up services and reports outlining factory provided start-up and equipment performance testing in accordance with Section VIII of these specifications. Manufacturer's representative shall instruct the maintenance personnel in the care of the equipment, prepare a training report, and submit three (3) copies of the start-up report to the District.

2.6 Measurement and Payment

There is no measurement associated with **Variable Frequency Drives (VFD's)**. Payment will be based on the following percentages of Contract lump sum price: 10% upon satisfactory review and approval of all shop drawings, 70% upon delivery of equipment, and 20% upon completion of start-up services, training, test report submittal, O & M manual submittal, and acceptance of equipment installed, complete in place.

IV – Bid Form

VFD Procurement for Cherry Valley Lift Station Pump Replacement Capital Project No. 1911

To: Board of Trustees
Rock River Water
Reclamation District
PO Box 7480
Rockford, IL 61126-7480

From: _____
(Individual, Partnership or Corporation)

(Address of Individual, Partnership or Corporation)

Trustees:

I (We) the undersigned hereby propose to furnish the VFD Procurement for Cherry Valley Lift Station Pump Replacement, Capital Project No. 1911 in compliance with the attached Notice, General Specifications and Instructions, Detailed Specifications, Bid Form, Fair Employment Practices Affidavit of Compliance Form, Forms of Affidavit, Contract Form, Technical Specifications, Exhibits, and General Provisions and Technical Specifications for Sanitary Sewer Construction.

The Undersigned also affirms and declares:

A. That he (they) has (have) examined and is (are) familiar with all the related contract documents and found that they are accurate and complete and are approved by the undersigned.

B. That he (they) has (have) carefully examined the scope of the required service, materials or equipment supplied, and that, from his (their) own investigation, has (have) satisfied himself (themselves) as to the nature and location of the delivery point, the character, quality and quantity of materials, and the kind and extent of equipment and other facilities needed for the performance of the service and provision of the materials, the general and local conditions and all difficulties to be encountered, and all other items which may, in any way, affect the services, materials, or equipment or their performance.

C. That this bid is made without any understanding, contract or connection with any other person, partnership, or corporation making a bid for the same purposes, and is in all respects fair and without collusion or fraud; and that he (they) is (are) not barred from submitting a bid as a result of a bid-rigging or bid-rotating conviction.

D. All goods and services provided in response to this request will be produced in compliance with all applicable requirements of Sections 6, 7 and 12 of the Fair Labor Standards Act, as amended, and of regulations and orders of the United States Department of Labor issued under Section 14 thereof.

E. The firm which I (we) represent complies with all applicable requirements of the Americans with Disabilities Act (ADA), the Occupational Safety and Health Act (OSHA), rules and regulations of the US Department of Transportation (DOT), and the Federal Drug Free Work Place Act. If said firm is awarded a contract to provide the District's Variable Frequency Drives, it will:

1. Complete all OSHA, ADA, and DOT required supervisory, employee and customer training,

2. Document compliance as required,
3. Ensure that persons in safety-sensitive positions associated with loading, transportation, and delivery of the merchandise or service detailed in these specifications are subject to all required drug and alcohol testing and are properly licensed,
4. Prepare and make available all required information and documentation, and
5. Hold harmless and indemnify the District and the District's representatives as defined in Section 2.14 from all:
 - a. Suits, claims, or actions;
 - b. Costs, either for defense (including but not limited to reasonable attorney's fees and expert witness fees) or for settlements, and;
 - c. Damages of any kind (including but not limited to fines, actual, punitive, and compensatory damages) relating in any way to or arising out of the ADA or the OSHA, to which said firm is exposed or which it incurs in the execution of the Contract.

F. The firm which I (we) represent has adopted and promulgated written sexual harassment policies that include, at a minimum, the following information:

1. the illegality of sexual harassment;
2. the definition of sexual harassment under Illinois State Law;
3. a description of sexual harassment, utilizing examples;
4. my (our) organization's internal complaint process including penalties;
5. the legal recourse, investigative and complaint process available through the Illinois Department of Human Rights and the Illinois Human Rights Commission;
6. directions on how to contact the Department and the Commission; and
7. protection against retaliation as provided by Section 6-101 of Illinois Human Rights Act.

Upon request, my (our) organization will provide the Illinois Department of Human Rights with the information described in F1 through F7 above.

In submitting this bid, I (we) understand that the District may reject part or all of any and all bids. I (we) agree that I (we) shall not withdraw this bid for a period of sixty (60) calendar days following the scheduled bid opening. I (we) have carefully examined the nature of the service, materials, and equipment. The cost of all the service, materials, and equipment necessary to complete this contract is given in this bid.

Lump Sum Bid Amount

Total Amount of Lump Sum Bid, expressed in figures, for providing all materials, equipment, warranty, and labor to complete this project in conformity with all specifications in this Invitation to Bid.

\$ _____

Additional Required Information

Proposed VFD Model: _____

The undersigned acknowledges that he has received Addendum numbers _____, _____, _____, and realizes that all Addenda are considered part of the Contract.

Date: _____

Bidder: _____
(Printed Name of Firm)

By: _____
(Authorized Rep's Signature)

(Printed Street Address)

By: _____
(Printed Authorized Rep's Name)

(Printed City, State, Zip)

By: _____
(Printed Authorized Rep's Title)

(Area Code and Phone Number)

By: _____
(Fax Number)

(Authorized Rep's Email Address)

The Rock River Water Reclamation District, a Governmental Unit, pays neither Federal Excise Tax nor Illinois Retailers' Occupational Tax. The bidder shall exclude those taxes from his bid.

The Board of Trustees of the Rock River Water Reclamation District (District) reserves the right to reject any and all bids, or any part thereof, or to accept any bid or part thereof, or to waive formalities in any bids deemed to be in the best interest of the District.

“No Bid” Response to Invitation to Bid

If your firm is unable to submit a bid at this time, please provide the information requested in the space provided below and return to:

Rock River Water Reclamation District
Attn: Christopher T. Baer, Engineering Manager
P.O. Box 7480
Rockford, IL 61126-7480

Responses can be delivered in person or sent via fax to:

Rock River Water Reclamation District
815.387.7665

We have received Invitation to Bid: VFD Procurement for Cherry Valley Lift Station Pump Replacement, Capital Project No. 1911, opening at 10:00 a.m. on Friday, July 12, 2019.

Reason for not bidding: _____

By: _____

Signature: _____
(Name & Title, Typed or Printed)

Company Name: _____

V - Fair Employment Practices Affidavit of Compliance
VFD Procurement for Cherry Valley Lift Station Pump Replacement
Capital Project No. 1911

Note: The bidder must execute this Affidavit and submit it with its signed Bid. The Rock River Water Reclamation District cannot accept any Bid which does not contain this Affidavit.

_____, being first duly sworn, deposes and says that:
(Name of person making affidavit)

They are _____ of _____
(Officer's Title) (Company's Name)

that said company is and "Equal Opportunity Employer" as defined by Section 2000(e) of Chapter 21, Title 42 of the United States Code annotated and Federal Executive Orders #11375 which are incorporated herein by reference;

and that said company will comply with any and all requirements of Title 44 Admin. Code 750. APPENDIX A – Equal Opportunity Clause, Rules and Regulations, Illinois Department of Human Rights, which read as follows:

"In the event of the Contractor's non-compliance with the provisions of this Equal Employment Opportunity Clause, the Illinois Human Rights Act or the Rules and Regulations of the Illinois Department of Human Rights ("Department"), the Contractor may be declared ineligible for future contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations, and the contract may be cancelled or voided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by statute or regulation. During the performance to this contract, the Contractor agrees as follows:

1. That it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, marital status, national origin or ancestry, citizen status, age, physical or mental handicap unrelated to ability, military status or an unfavorable discharge from military service; and further that it will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization.
2. That, if he or she hires additional employees in order to perform this Contract or any portion of this Contract, he or she will determine the availability (in accordance with the Department's Rules and Regulations) of minorities and women in the areas from which he or she may reasonably recruit and he or she will hire for each job classification for which employees are hired in a way that minorities and women are not underutilized.
3. That, in all solicitations or advertisements for employees placed by him or her or on his or her behalf, he or she will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, sexual orientation, marital status, national origin or ancestry, citizenship status, age, physical or mental handicap unrelated to ability, sexual orientation, military status or an unfavorable discharge from military service.
4. That he or she will send to each labor organization or representative of workers with which he or she has or is bound by a collective bargaining or other agreement or

understanding, a notice advising such labor organization or representative of the Contractor's obligations under the Illinois Human Rights Act and the Department's Rules and Regulations. If any labor organization or representative fails or refuses to cooperate with the Contractor in his or her efforts to comply with such Act and Rules and Regulations, the contractor will promptly so notify the Department and the contracting agency and will recruit employees from other sources when necessary to fulfill its obligations under the Contract.

5. That he or she will submit reports as required by the Department's Rules and Regulations, furnish all relevant information as may from time to time be requested by the Department or the contracting agency, and in all respects comply with the Illinois Human Rights Act and the Departments Rules and Regulations.
6. That he or she will permit access to all relevant books, records, accounts and work sites by personnel of the contracting agency and the Department for purposes of investigation to ascertain compliance with the Illinois Human Rights Act and the Department's Rules and Regulations.
7. That he or she will include verbatim or by reference the provisions of this clause in every subcontract awarded under which any portion of the contract obligations are undertaken or assumed, so that the provisions will be binding upon the subcontractor. In the same manner as with other provisions of this Contract, the Contractor will be liable for compliance with applicable provisions of this clause by such subcontractors; and further it will promptly notify the contracting agency and the Department in the event any subcontractor fails or refuses to comply with the provisions. In addition, the contractor will not utilize any subcontractor declared by the Illinois Human Rights Commission to be ineligible for contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations.

(Source: Amended at 32 Ill. Reg. 16484, effective September 23, 2008)"

IL Dept. of Human Rights Registration No. _____ Expiration Date: _____

Signature

Subscribed and sworn to before me this _____ day of _____, 20_____.

Notary Public

VI – Forms of Affidavit

VFD Procurement for Cherry Valley Lift Station Pump Replacement Capital Project No. 1911

City: _____ County: _____ State: _____

This Section for Sole Proprietorship:

I, _____ (name), being duly sworn, depose and say that the organization I represent is a sole proprietorship, and that I am the person described in and who executed the foregoing bid and that the several matters therein stated are in all respects true.

Signature _____

This Section for Partnership:

I, _____ (name), being duly sworn, depose and say that I am a member of _____ (partnership name), the firm described in and which executed the foregoing bid; that I duly subscribed the name of the firm thereunto on behalf of the firm; and that the several matters therein stated are in all respects true.

Signature _____

This Section for Corporation:

We, _____ (representative who signed the Bid Form), and _____ (other corporate officer), being duly sworn, depose and say that we reside in the cities of _____ and _____, respectively, and that we are the _____ (representative's title) and the _____ (other corporate officer's title), respectively, of _____ (corporation name), the firm described in and which executed the foregoing instrument; that we are authorized to complete this form and to enter into this contract on behalf of said corporation; that we have signed our names thereto by like order; and that we have knowledge of the several matters therein stated and they are in all respects true.

(Representative's Signature)

(Other Corporate Officer's Signature)

This Section for a Limited Liability Corporation:

I, _____ (name), being duly sworn, depose and say that I am a
_____ (representative's title) of _____
(company name), the company described in and which executed the foregoing proposal; that I
am authorized to complete this form and to enter into this contract on behalf of said company
and have knowledge of the several matters therein stated and they are in all respects true.

Signature _____

Notarization (required for all successful bidders):

Subscribed and sworn to before me this _____ day of _____, 20____.

Notary Public _____

County _____

My Commission Expires _____

VII - Contract

VFD Procurement for Cherry Valley Lift Station Pump Replacement Capital Project No. 1911

THIS CONTRACT, made and concluded this ____ day of _____, 20_____,
between the Rock River Water Reclamation District, Illinois, also known as "District," and
_____ his/their executors, administrators, successors or
assigns, known as "Contractor":

In consideration of the payments and contracts mentioned in the Bid attached hereto, to be made and performed by the District, the Contractor agrees with the District at his/their own proper cost and expense to do all the work, furnish all equipment, materials and all labor necessary to complete the work and furnish the merchandise in accordance with the specifications hereinafter described, and the District's requirements.

1. Scope

Both parties understand and agree that the Notice, General Specifications and Instructions, Detailed Specifications, Bid Form, Fair Employment Practices Affidavit of Compliance Form, Forms of Affidavit, Contract Form, Technical Specifications, Exhibits, and General Provisions and Technical Specifications for Sanitary Sewer Construction of the Invitation to Bid: VFD Procurement for Cherry Valley Lift Station Pump Replacement, Capital Project No. 1911, all Addenda there to (if any), and any and all provisions required by law, are all essential documents of the contract, and are a part hereof, as if herein set out verbatim or as if attached, except for titles, subtitles, headings, table of contents and portions specifically excluded.

The Successful Bidder shall provide the District's VFD Procurement for Cherry Valley Lift Station Pump Replacement, Capital Project No. 1911 at the bid price, and a six (6) year warranty from date of equipment installation and successful start-up, per Section III 2.4.

2. Contract Price

The District shall pay to the Contractor, and the Contractor shall accept, in the manner and at such times, such amounts as required by the Contract Documents, subject to any additions or deductions provided for hereby, in current funds, the total Contract price of:

_____ (\$_____)

This will be the only basis for payment for the Contract's duration, and that in the absence of changes to which the District and Contractor agree because of revisions to the scope of the VFD Procurement for Cherry Valley Lift Station Pump Replacement, Capital Project No. 1911, this Contract allows for no price increases.

3. Contract Execution

The Contractor shall:

- A. Perform all services in a responsible manner, supplying only service, materials, or equipment that meets or exceeds the District's specifications;
- B. Deliver the VFD Procurement for Cherry Valley Lift Station Pump Replacement, Capital Project No. 1911 in conformity with the specifications;
- C. Sustain all loss or damage arising out of the nature of the work to be done, or from any unforeseen obstruction or difficulty which he may encounter in the prosecution of the work, or from the action of the elements;
- D. Be responsible for all accidents he, his employees, or agents may incur in the Contract's execution;
- E. Hold the District and its representatives harmless from liability of any nature or kind on account of use of any copyrighted or un-copyrighted composition, secret process, patented or unpatented invention, article or appliance furnished or used under this Contract. The Contractor shall likewise hold harmless and indemnify the District and its representatives from all:
 - 1. suits, claims, or actions,
 - 2. costs, either for defense or for settlements, and
 - 3. damages

to which the District or its representatives might be exposed by reason of an injury or alleged injury, to the person or property of another:

- a. in the execution of the Contract, or
- b. from actions the District or its representatives take on the Contractor's behalf,

except in cases where such suits, claims, actions, or costs are found to be based on the District's negligence. For purposes of this paragraph, "its representatives" means "the Rock River Water Reclamation District's trustees, employees, agents, assigns, and their heirs;"

- F. Comply with all applicable requirements of the Americans with Disabilities Act (ADA), the Occupational Safety and Health Act (OSHA), rules and regulations of the US Department of Transportation (DOT), and the Federal Drug Free Work Place Act, and will:
 - 1. complete all OSHA, ADA, and DOT required supervisory, employee and customer training,
 - 2. document compliance as required,
 - 3. ensure that persons in safety-sensitive positions associated with loading, transportation, and delivery of the merchandise or service detailed in these specifications are subject to all required drug and alcohol testing and are properly licensed,
 - 4. prepare and make available all required information and documentation, and

5. hold harmless and indemnify the District and the District's representatives as defined in Section 2.14 from all:

- a. Suits, claims, or actions;
- b. Costs, either for defense (including but not limited to reasonable attorney's fees and expert witness fees) or for settlements, and;
- c. Damages of any kind (including but not limited to fines, actual, punitive, and compensatory damages) relating in any way to or arising out of the ADA or the OSHA, to which said firm is exposed or which it incurs in the execution of the Contract.

G. Adopt and promulgate written sexual harassment policies that include, at a minimum, the following information:

1. the illegality of sexual harassment;
2. the definition of sexual harassment under Illinois State law;
3. a description of sexual harassment, utilizing examples;
4. Contractor's internal complaint process including penalties;
5. the legal recourse, investigative and complaint process available through the Illinois Department of Human Rights and the Illinois Human Rights Commission;
6. directions on how to contact the Department and the Commission; and
7. protection against retaliation as provided by Section 6-101 of Illinois Human Rights Act.

Upon request, Contractor will provide the Illinois Department of Human Rights with the information described in G1 through G7 above.

H. Maintain all specified insurance for the duration of the contract.

I. The Steel Products Procurement Act, Illinois Public Act 83-1030, requires that steel products used or supplied in performance of this Contract or subcontract shall be manufactured or produced in the United States with three (3) exceptions, as explained in the Instructions to Bidders.

J. In the absence of the District's written permission, the Contractor shall not use the District's name in any form or medium of public advertising.

K. This Contract shall extend to and be binding upon the successors and assigns, and upon the heirs, administrators, executors, and legal representatives of the Contractor.

In consideration of and to induce the award of this Contract to him, the Contractor represents and warrants: that he is not in arrears to the District upon debt of the Contract and that he is not a defaulter, as surety, Contractor or otherwise; that he is financially solvent and sufficiently experienced and competent to perform the work; that the work can be performed as called for by the Contract; that the facts stated in his proposal and the information given by him is true and correct in all respects, and that he is fully informed regarding all the conditions affecting the work to be done and labor and materials to be furnished for the completion of this Contract and that his information was secured by personal investigation and research.

If the Contractor defaults, the District may procure the materials or services described in this Invitation to Bid from other sources. In such an event, the price the District pays shall constitute the prevailing market price at the time of such purchase and the defaulting Contractor shall pay the District the difference between his bid price and the prevailing market price. The defaulting Contractor shall make such payment no more than sixty (60) calendar-days after the District notifies him, in writing, of such an occurrence.

4. Payments to Contractor

If the District receives an acceptable invoice for conforming service prior to the fifth day of the month, the District shall issue payment before the fifth day of the succeeding month. If received on or after the fifth day of the month, payment will be issued the following month.

- A. The first application for payment shall not exceed ten percent (10%) of the Contract amount, following approval of shop drawings.
- B. The second application for payment shall not exceed seventy percent (70%) of the Contract amount, following delivery of all equipment.
- C. The third application for payment shall include the remaining Contract amount and shall be submitted after completion of start-up services, training, test report submittal, O & M manual submittal, and acceptance of equipment installed, complete in place.

5. Subcontracts

No part of the work herein provided for shall be sublet or subcontracted without the express written consent of the District, and in no case shall consent relieve said Contractor from the obligation herein entered into, or change the terms of this Contract.

6. Contractor's Responsibility

This Contract shall extend to and be binding upon the successors and assigns, and upon the heirs, administrators, executors, and legal representatives of the Contractor.

7. Time

The District will confirm any award decision in writing, to the successful bidder. Within ten (10) days of the Notice of Award, the Contractor shall submit an executed Contract and acceptable insurance documentation per the Invitation to Bid. Upon receipt of acceptable insurance documents, the District will issue the Notice to Proceed (NTP). Shop drawings shall be submitted, reviewed, resubmitted, and approved within four (4) weeks of the date of the NTP. This schedule shall allow one (1) week for each District review. Equipment shall be delivered to the site within fourteen (14) weeks from the date of the NTP. Failure to deliver within the indicated time shall result in liquidated damages of \$300 per calendar day until delivery is completed.

8. Seals

IN WITNESS WHEREOF, the parties have hereunto set their hands, and are duly authorized to enter into such Contracts on behalf of their respective organizations.

Name of Firm – Contractor

By: _____
Authorized Signature

Attest:
By: _____

Its: _____

Rock River Water Reclamation District
Winnebago County, Illinois

By _____
Director

Attest:

Business Manager

State of Illinois)
County of Winnebago)

On this _____ day of _____, 20____ before me, a notary public within and for said County, personally appeared Timothy S. Hanson and Chris Black, to me personally known, who, being each by me duly sworn did say that they are respectively, the Director and Business Manager of the Rock River Water Reclamation District, named in the foregoing instrument, and that said instrument was signed and sealed in behalf of the District, and said Director and Business Manager acknowledge said instrument to be the free act and deed of said District.

(SEAL)

Notary Public

VIII - Technical Specifications

VFD Procurement for Cherry Valley Lift Station Pump Replacement Capital Project No. 1911

Section 16483

VARIABLE FREQUENCY DRIVES

PART 1. GENERAL

1.1 RELATED DOCUMENTS

- A. General provisions of the Contract
- B. Proposed Pump Motor Data
- C. Cherry Valley Lift Station Record Drawings

1.2 SUMMARY

- A. IEEE 519 levels must be met at the PCC described in this Specification.
- B. Section includes separately enclosed, pre-assembled, combination VFDs, rated 600 V and less, for speed control of three-phase, squirrel-cage induction motors.
 - 1. P2-101-2 469FLA (18-pulse w/ bypass)
 - 2. P3-101-3 469FLA (18-pulse w/ bypass)

1.3 DEFINITIONS

- A. CPT: Control power transformer.
- B. IGBT: Insulated-gate bipolar transistor.
- C. LED: Light-emitting diode.
- D. MCP: Motor Control Panel
- E. PCC: Point of common coupling.
- F. PID: Proportional-Integral-Derivative
- G. PWM: Pulse-width modulated.
- H. RFI: Radio-frequency interference.
- I. TDD: Total demand (harmonic current) distortion.
- J. THD(V): Total harmonic voltage demand.
- K. VFD: Variable Frequency Drive

1.4 SUBMITTALS

- A. Submit under the provisions of Section III 2.2 of these specifications.
- B. Shop Drawings: For each VFD indicated, include the dimensioned plans, elevations, and sections; and conduit entry locations and sizes, mounting arrangements, and details, including required clearances and service space around equipment.
 - 1. Show tabulations of installed devices, equipment features, and ratings.

Include the following:

- a) Each installed unit's type and details.
 - b) Factory-installed devices.
 - c) Enclosure types and details.
 - d) Nameplate legends.
 - e) Short-circuit current (withstand) rating of complete assembly with documentation substantiating rating indicated. The short circuit rating of the assembly shall be greater than the available fault current of the power supply feeding the VFD assembly.
 - f) Features, characteristics, ratings, and factory settings of each VFD and installed devices.
 - g) Specified modifications.
2. Schematic and Connection Wiring Diagrams for power, signal, and control wiring.
 3. Product Data: For each type and rating of VFD indicated, include features, performance, electrical ratings, operating characteristics, shipping and operating weights, and furnished specialties and accessories.
 - a) Complete system rating including overall drive system operating data, including efficiencies, input current ratings, output current rating, and power factors, at driven equipment actual loads of 0, 40, 60, 80, 100, and 110 percent of rated speed.
 - b) Maximum heat dissipation from enclosure.
 - c) Layout of controller face showing pushbuttons, switches, instruments, indicating lights, etc.
 - d) Itemized bill-of-materials listing all system components.
 - e) Complete system interconnection diagrams between controller, DV/DT filter, motor, and all related components or controls external to system, including wire numbers and terminal board point identification.
 - f) Complete system schematic (elementary) wiring diagrams.
- C. Load-Current and List of Settings of Adjustable Overload Relays: Compile after motors have been installed and arrange to demonstrate that switch settings for motor-running overload protection suit actual motors to be protected.
- D. Harmonic Analysis Study and Report: Comply with IEEE 399 and NETA Acceptance Testing Specification; identify the effects of nonlinear loads and their associated harmonic contributions on the voltages and currents throughout the electrical system. Analyze possible operating scenarios, including recommendations for VFD input filtering to limit TDD and THD(V) at each VFD to specified levels.
1. Prior to installation, the VFD manufacturer shall provide the estimated total harmonic distortion (THD) caused by the VFD's. The results shall be based on a computer aided circuit simulation of the total actual system, with information obtained from the power service provider and the user.
- E. Source quality-control reports.
- F. Field quality-control reports.

1.5 OPERATION AND MAINTENANCE DATA

- A. Submit under the provisions of Section III 2.2 of these specifications.
- B. VFD operation and maintenance manuals shall include the following:
 - 1. Manufacturer's written instructions for testing and adjusting thermal-magnetic circuit breaker and MCP trip settings.
 - 2. Manufacturer's written instructions for setting field-adjustable overload relays.
 - 3. Manufacturer's written instructions for testing, adjusting, and reprogramming microprocessor control modules.
 - 4. Manufacturer's written instructions for setting field-adjustable timers, controls, and status and alarm points.
 - 5. Recommended spare parts list.
 - 6. Warranty
 - 7. Installation Instruction Manuals.
 - 8. Operation Instruction Manuals.
 - 9. Setup Instruction Manuals.
 - 10. Programming Instruction Manuals.
 - 11. Repair and Preventative Maintenance Manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS (Not required)

1.7 QUALITY ASSURANCE

- A. All variable frequency drives shall be by one manufacturer.
- B. Supplier: Minimum 10 years' experience in furnishing similar size and type adjustable frequency, controlled speed, drive systems.
- C. For the equipment specified herein, the manufacturer shall be ISO 9001 certified.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- E. Comply with NFPA 70.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Delivery, storage and handling shall be in accordance with Section III 2.3 of these specifications.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Rate equipment for continuous operation, capable of driving full load without derating, under the following conditions unless otherwise indicated:
 - 1. Ambient Temperature: Not less than 14°F and not exceeding 104°F.
 - 2. Ambient Storage Temperature: Not less than -4°F and not exceeding

- 140°F.
3. Humidity: Less than 95 percent (noncondensing).
 4. Altitude: Not exceeding 3,300 feet.

1.10 COORDINATION

- A. Coordinate features of motors, load characteristics, installed units, and accessory devices to be compatible with the following:
 1. Torque, speed, and horsepower requirements of the load.
 2. Ratings and characteristics of supply circuit and required control sequence.
 3. Ambient and environmental conditions of installation location.
 4. Coordinate sizes and locations of concrete bases with actual equipment provided.

1.11 SPARE PARTS

- A. None required.

1.12 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace VFDs that fail in materials or workmanship within specified warranty period.
- B. Warranty Period: The six (6) year warranty period shall start upon equipment installation and successful start-up.
- C. The warranty shall include parts, labor, travel and all associated living expenses incurred by the manufacturer to provide factory authorized on-site service. The warranty shall be provided by the VFD manufacturer.

PART 2. PRODUCTS

2.1 MANUFACTURED UNITS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Danfoss Inc.; Danfoss Drives Div.
 2. ABB
- B. General Requirements for VFDs: Comply with NEMA ICS 7, NEMA ICS 61800-2, and UL 508C.
- C. Application: Variable torque.
- D. VFD Description: Variable-frequency power converter (rectifier, DC bus, and IGBT, PWM inverter) factory packaged in an enclosure, with integral disconnecting means and overcurrent and overload protection; listed and labeled by an NRTL as a complete unit; arranged to provide self-protection, protection, and variable-speed control of one or more three-phase induction motors by adjusting output voltage and frequency. The solid state VFD shall employ a full wave

rectifier, AC input / output Line Reactors (dual DC link reactors acceptable), capacitors, and IGBT's as the output switching device.

1. Units suitable for operation of inverter-duty motors as defined by NEMA MG 1, Section IV, Part 31, "Definite-Purpose Inverter-Fed Polyphase Motors."
 2. Listed and labeled for integrated short-circuit current (withstand) rating by an NRTL acceptable to authorities having jurisdiction.
- E. Design and Rating: Match load type, such as fans, blowers, and pumps; and type of connection used between motor and load such as direct or through a power-transmission connection.
- F. Output Rating: Three-phase; 10 to 60 Hz, with voltage proportional to frequency throughout voltage range; maximum voltage equals input voltage.
- G. Unit Operating Requirements:
1. Input AC Voltage Tolerance: Plus 10 and minus 10 percent of VFD input voltage rating.
 2. Input AC Voltage Unbalance: Not exceeding 5 percent.
 3. Input Frequency Tolerance: Plus or minus 3 percent of VFD frequency rating.
 4. Minimum Efficiency: 97 percent at 60 Hz, full load.
 5. Minimum Displacement Primary-Side Power Factor: 98 percent under any load or speed condition.
 6. Minimum Short-Circuit Current (Withstand) Rating: [65] [100] kA.
 7. Vibration Withstand: Comply with IEC 60068-2-6.
 8. Overload Capability: 1.1 times the base load current for 60 seconds; minimum of 1.5 times the base load current for three seconds.
 9. Starting Torque: Minimum 100 percent of rated torque from 3 to 60 Hz.
 10. Speed Regulation: Plus or minus 10 percent.
 11. Output Carrier Frequency: Selectable; 0.5 to 8 kHz. In addition, the output carrier frequency shall be randomly modulated about the selected frequency.
 12. Stop Modes: Programmable; includes fast, free-wheel, and dc injection braking.
- H. Inverter Logic: Microprocessor based, isolated from all power circuits.
- I. Isolated Control Interface: Allows VFDs to follow remote-control signal over a minimum 40:1 speed range.
1. Signal: Electrical.
- J. Internal Adjustability Capabilities:
1. Minimum Speed: 5 to 25 percent of maximum rpm.
 2. Maximum Speed: 80 to 100 percent of maximum rpm.
 3. Acceleration: 0.1 to 999.9 seconds.
 4. Deceleration: 0.1 to 999.9 seconds.
 5. Current Limit: 30 to minimum of 150 percent of maximum rating.
- K. Self-Protection and Reliability Features:
1. Input transient protection by means of surge suppressors to provide three-phase protection against damage from supply voltage surges 10 percent or more above nominal line voltage.
 2. Loss of Input Signal Protection: Selectable response strategy, including

- speed default to a percent of the most recent speed, a preset speed, or stop; with alarm.
3. Under- and overvoltage trips.
 4. Inverter overcurrent trips.
 5. VFD and Motor Overload/Overtemperature Protection: Microprocessor-based thermal protection system for monitoring VFDs and motor thermal characteristics, and for providing VFD overtemperature and motor overload alarm and trip: settings selectable via the keypad: NRTL approved.
 6. Critical frequency rejection, with selectable, adjustable deadbands.
 7. Instantaneous line-to-line and line-to-ground overcurrent trips.
 8. Reverse-phase protection.
 9. Short-circuit protection.
 10. Motor overtemperature fault.
 11. Ground fault.
 12. The VFD and softstart bypass motor control circuitry shall be protected from sustained power or phase loss. This protection shall utilize an under-voltage relay located on the secondary side of the 120 volt AC control power transformer and be set to deactivate all power circuitry if the voltage drops below the safe operating range (95 volts AC) of the mechanical contactors.
- L. Automatic Reset/Restart: Attempt three restarts after drive fault or on return of power after an interruption and before shutting down for manual reset or fault correction; adjustable delay time between restart attempts.
- M. Bidirectional Autospeed Search: Capable of starting VFD into rotating loads spinning in either direction and returning motor to set speed in proper direction, without causing damage to drive, motor, or load.
- N. Torque Boost: Automatically varies starting and continuous torque to at least 1.5 times the minimum torque to ensure high-starting torque and increased torque at slow speeds.
- O. Motor Temperature Compensation at Slow Speeds: Adjustable current fall back based on output frequency for temperature protection of self-cooled, fan-ventilated motors at slow speeds.
- P. Integral Input Disconnecting Means: Pad-lockable, door-mounted handle mechanism.
1. Disconnect Rating: Not less than 115 percent of NFPA 70 motor full-load current rating or VFD input current rating, whichever is larger.
 2. Auxiliary Contacts: NO/NC, arranged to activate before switch blades open.
 3. Auxiliary contacts "a" and "b" arranged to activate with disconnect handle.
- Q. The controller's full load output current rating shall be based on 40° ambient temperature.
- R. The drive shall employ a current limit circuit to provide trip free operation and shall have the capability to be set between 40 and 110 percent of the drive controller output. The current limit shall be able to be set either manually via the keypad, by a frequency level, by a logic input or by an analog input.
- S. The VFD shall be optimized for a 4 kHz carrier frequency to reduce motor noise and provide high system efficiency. The carrier frequency shall be adjustable by

the start-up engineer or the drive shall have the capability to inject a white noise down the motor leads to reduce motor noise.

- T. Galvanic and/or optical isolation shall be provided between the drive's power circuitry and control circuitry to ensure operator safety and to protect connected electronic control equipment from damage caused by voltage spikes, current surges, and ground loop currents. Drives not including isolation on both analog I/O and discrete I/O shall include additional isolation modules as manufactured by Action Instruments, Inc. or District approved equal.
- U. Door interlocked circuit breaker disconnect switch which will disconnect all input power from the drive and all internally mounted options. The disconnect handle shall be thru-the-door type, and be padlockable in the "Off" position.
- V. 120 V AC control to allow VFD to interface with remote dry contacts.

2.2 CONTROLS AND INDICATION

- A. Panel-Mounted, 3-position Hand-Off-Auto Switch: When in "Hand", the VFD will be started, and the speed will be controlled from the speed potentiometer. When in "Off", the VFD will be stopped. When in "Auto", the VFD will start via an external contact closure, and its speed will be controlled via an external speed reference
- B. Panel-Mounted Operator Station: Manufacturer's standard front-accessible, sealed keypad and plain English language digital display; allows complete programming, program copying, operating, monitoring, and diagnostic capability.
 - 1. Keypad: In addition to required programming and control keys.
 - 2. Security Access: Provide electronic security access to controls through identification and password with at least three levels of access: View only; view and operate; and view, operate, and service.
 - a) Control Authority: Supports at least four conditions: Off, local manual control at VFD, local automatic control at VFD, and automatic control through a remote source.
- C. Historical Logging Information and Displays:
 - 1. Real-time clock with current time and date.
 - 2. Running log of total power versus time.
 - 3. Total run time.
 - 4. Fault log, maintaining last four faults with time and date stamp for each.
- D. Indicating Devices: Digital display mounted flush in VFD door and connected to display VFD parameters including, but not limited to:
 - 1. Output frequency (Hz).
 - 2. Motor speed (rpm).
 - 3. Motor status (running, stop, fault).
 - 4. Motor current (amperes).
 - 5. Fault or alarming status (code).
 - 6. Motor output voltage (V ac)
 - 7. Elapsed Time Meter.
 - 8. kWh meter.
- E. Control Signal Interfaces:
 - 1. Electric Input Signal Interface:
 - 2. Inputs: A minimum of six (6) programmable digital inputs, two (2) analog

inputs and serial communications interface shall be provided with the following available as a minimum:

- a) Remote manual/auto
- b) Remote start/stop
- c) Remote forward/reverse
- d) Remote preset speeds
- e) Remote external trip
- f) Remote fault reset
- g) Process control speed reference interface, 4-20mA DC
- h) Potentiometer and 0-10 V DC speed reference interface
- i) Fixed frequencies using digital inputs.
- j) RS-232 programming and operation interface port
- k) Serial communications capability

3. Outputs: A minimum of two (2) discrete programmable digital outputs, one (1) programmable open collector output, and one (1) programmable analog output shall be provided, with the following available at minimum.

- a) Programmable relay outputs with one (1) set of form C contacts for each, selectable with the following available at minimum:

- (1) Fault
- (2) Run
- (3) Ready
- (4) Reversing
- (5) Jogging
- (6) At speed
- (7) In torque limit
- (8) Motor rotation direction opposite of commanded
- (9) Over-temperature.

4. Programmable open collector output with available 24 V DC power supply and selectable with the following available at minimum:

- a) Fault
- b) Run
- c) Ready
- d) Reversing
- e) Jogging
- f) At speed
- g) In torque limit
- h) Motor rotation direction opposite of commanded
- i) Over-temperature.

5. Programmable analog output signal, selectable with the following available at minimum:

- a) Output current
- b) Output frequency
- c) Motor speed
- d) Motor torque
- e) Motor power
- f) Motor voltage
- g) DC link voltage

6. Monitoring and Displays:

- a) The VFD display shall be a LCD type capable of displaying three (3)

lines of text and the following thirteen (13) status indicators:

- (1) Run
- (2) Forward
- (3) Reverse
- (4) Stop
- (5) Ready
- (6) Alarm
- (7) Fault
- (8) Local
- (9) Panel
- (10) Remote
- (11) Hand
- (12) Auto
- (13) Off

b) The VFD keypad shall be capable of displaying the following monitoring functions at a minimum:

- (1) Output frequency
- (2) Output speed
- (3) Motor current
- (4) Motor torque
- (5) Motor power
- (6) Motor voltage
- (7) DC-link voltage
- (8) Heatsink temperature
- (9) Total operating days counter
- (10) Operating hours (with reset function)
- (11) Total megawatt hours
- (12) Megawatt hours (with reset function)
- (13) Voltage level of analog input
- (14) Current level of analog input
- (15) Digital inputs status
- (16) Digital and relay outputs status
- (17) Motor temperature rise, percentage of allowable.

7. Protecting Functions:

a) The VFD shall include the following protective features at minimum:

- (1) Over-current
- (2) Over-voltage
- (3) Inverter fault
- (4) Under-voltage
- (5) Phase loss
- (6) Output phase loss
- (7) Under-temperature
- (8) Over-temperature
- (9) Motor stalled
- (10) Motor over-temperature
- (11) Motor under-load
- (12) Logic voltage failure
- (13) Microprocessor failure
- (14) DC injection braking.

b) The VFD shall provide ground fault protection during power-up,

starting, and running. VFD with no ground fault protection during running are not acceptable.

- F. PID Control Interface: Provides closed-loop set point, differential feedback control in response to dual feedback signals. Allows for closed-loop control of fans and pumps for pressure, flow, or temperature regulation.
 - 1. Number of Loops: One.
- G. Three (3) programmable critical frequency lockout ranges to prevent the VFD from continuously operating at an unstable speed.
- H. Four (4) programmable preset speeds.
- I. The VFD shall Ramp or Coast to a stop, as selected by the user.
- J. For fan and pump applications, the acceleration and deceleration profile shall be an S-curve to avoid abrupt speed changes.

2.3 LINE CONDITIONING AND FILTERING

- A. Based on the harmonic analysis study and report, the VFD shall be provided with line-side harmonic reduction, as required, to insure that the current distortion limits, as defined in table 10.3 of IEEE 519-1992, are met. PCC1, defined as the low voltage side of the distribution transformer, is used for purposes of calculation and referred, by the turns ratio of the transformer, to the PCC defined by the IEEE Recommended Practices as the Consumer-Utility interface. The tables of limits set forth therein are with reference to the PCC ($I_{sc}/I_l < 20$). This can be done by utilizing 18-pulse drives with passive harmonic filters. Passive filters must have capacitor cut-out contactors to remove the capacitors when the generator is running. Electrical contractor to provide wiring between SCADA panel and passive harmonic filters to cut out capacitors while generator is running. Passive harmonic filters can be provided by the following manufacturers:
 - 1. MTE Matrix AP Harmonic Filter.
 - 2. Mirus International
 - 3. TCI, LLC
- B. Harmonic solutions shall be designed to withstand up to 2% line imbalances with the maximum Current Distortion not to exceed 11% at 100% load.
- C. Harmonic solutions shall be capable of withstanding up to 2% ambient voltage distortion with the maximum Current Distortion not to exceed 12% at 100% load.
- D. To ascertain the harmonic contribution of the VFD's at the PCC and to show compliance with IEEE 519-1992, harmonic analysis shall be performed and submitted with the bid package, provided that the VFD vendor is in receipt of the below listed information 10 working days prior to the bid date. EMI/RFI Filtering: CE marked; certify compliance with IEC 61800-3 for Category C2.
 - 1. kVA rating of the low voltage distribution transformer(s)
 - 2. X/R Ratio of utility low voltage distribution transformer(s)
 - 3. Primary voltage
 - 4. Secondary voltage
 - 5. Secondary %IZ (impedance)
 - 6. Length, size, & number of conductors between transformer LV side and distribution panel

7. System Single Line Diagram and electrical equipment list showing transformer and VFD detail
 8. Total linear load kW to be connected to the distribution transformer
 9. Anticipated maximum demand load (15 minute or 30 minute) on the distribution transformer (IEEE 519)
- E. The use of 12 pulse rectifiers, Active filters or Active converter sections are not acceptable.
- F. The VFD shall provide internal DC link reactors to minimize power line harmonics and to provide near unity power factor. DC Link reactor shall be installed so that power fluctuations to the DC Capacitors shall be reduced to increase Capacitor life. VFD's without a DC link reactor shall provide a 3% impedance line side reactor and provide spare capacitors.

2.4 BYPASS SYSTEMS

- A. Bypass Operation: Safely transfers motor between power converter output and bypass circuit, manually, automatically, or both. Selector switches set modes and indicator lights indicate mode selected. Unit is capable of stable operation (starting, stopping, and running) with motor completely disconnected from power converter.
- B. Bypass Mode: Field-selectable automatic or manual, allows local and remote transfer between power converter and bypass contactor and retransfer, either via manual operator interface or automatic control system feedback.
- C. Bypass Controller: Three-contactor-style bypass allows motor operation via the power converter or the bypass controller; with barriers arranged to isolate the power converter and permit safe troubleshooting and testing, both energized and de-energized, while motor is operating in bypass mode.
1. Bypass Contactor: Load-break, IEC-rated contactor.
 2. Output Isolating Contactor: Non-load-break, IEC-rated contactor.
 3. A drive input contactor shall be used for isolation.
- D. Bypass Contactor Configuration: Reduced-voltage soft start.
1. NORMAL/BYPASS Selector Switch.
 2. HAND/OFF/AUTO Selector Switch.
 3. NORMAL/TEST Selector Switch: Allows testing and adjusting of VFD while the motor is running in the bypass mode.
 4. Contactor Coils: Pressure-encapsulated type with coil transient suppressors.
 - a) Operating Voltage: Depending on contactor IEC size and line- voltage rating, manufacturer's standard matching control power or line voltage.
 - b) Power Contacts: Totally enclosed, double break, and silver-cadmium oxide; assembled to allow inspection and replacement without disturbing line or load wiring.
 5. Control Circuits: 120-V ac; obtained from integral CPT, with primary and secondary fuses, with CPT of sufficient capacity to operate all integral devices and remotely located pilot, indicating, and control devices.
 - a) CPT Spare Capacity: 50 VA.
 6. Overload Relays: NEMA ICS 2.

- a) Solid-State Overload Relays:
 - (1) Switch or dial selectable for motor-running overload protection.
 - (2) Sensors in each phase.
 - (3) Class 20 tripping characteristic selected to protect motor against voltage and current unbalance and single phasing.
- 7. The output/bypass contactors are to be electrically and mechanical interlocked for safety reasons.

2.5 ENCLOSURES

- A. Provide single enclosure for all components.
- B. VFD Enclosures: NEMA 250, to comply with environmental conditions at installed location.
 - 1. Indoor Dry and Clean Locations: Type 1, filtered and gasketed.
- C. Required Dimension Restrictions: Enclosure shall be designed to have the following dimensions:
 - 1. Length: Total length available, including space between enclosures, for both 18-pulse VFD enclosures is 180".
 - 2. Depth: 36" or less.
 - 3. Height: 105" or less.
 - 4. Enclosures that do not meet these restrictions must be approved by the District.

2.6 ACCESSORIES

- A. General Requirements for Control-Circuit and Pilot Devices: NEMA ICS 5; factory installed in VFD enclosure cover unless otherwise indicated.
 - 1. Push Buttons, Pilot Lights, and Selector Switches: Heavy-duty, type.
 - a) Push Buttons: Recessed types; momentary.
 - b) Pilot Lights: LED types; push to test.
 - c) Selector Switches: Rotary type.
- B. Control Relays: Auxiliary and adjustable solid-state time-delay relays.
- C. Phase-Failure, Phase-Reversal, and Undervoltage and Overvoltage Relays: Solid-state sensing circuit with isolated output contacts for hard-wired connections. Provide adjustable undervoltage, overvoltage, and time-delay settings.
 - 1. Current Transformers: Continuous current rating, basic impulse insulating level (BIL) rating, burden, and accuracy class suitable for connected circuitry. Comply with IEEE C57.13.

2.7 SOURCE QUALITY CONTROL

- A. Testing: Test and inspect VFDs according to requirements in NEMA ICS 61800-2.
 - 1. Test each VFD while connected to a motor that is comparable to that for which the VFD is rated.
 - 2. Verification of Performance: Rate VFDs according to operation of functions and features specified.

- B. VFDs will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

PART 3. EXECUTION

3.1 EXAMINATION

- A. The District shall examine VFD upon delivery. VFD's that are wet, moisture damaged, or mold damaged shall be rejected.
- B. The Manufacturer's representative shall examine areas, surfaces, and substrates to receive VFD's, with Installation Contractor present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- C. The Manufacturer's representative shall examine roughing-in for conduit systems to verify actual locations of conduit connections before VFD installation.
- D. The Installation Contractor shall proceed with installation only after unsatisfactory conditions have been corrected.

3.2 HARMONIC ANALYSIS STUDY

- A. Perform a harmonic analysis study to identify the effects of nonlinear loads and their associated harmonic contributions on the voltages and currents throughout the electrical system. Analyze possible operating scenarios, including recommendations for VFD input filtering to limit TDD and THD(V) at each VFD to specified levels.
- B. Prepare a harmonic analysis study and report complying with IEEE 399 and NETA Acceptance Testing Specification. Submit under the provisions of Section III 2.2.

3.3 FACTORY TESTING

- A. The following standard factory tests shall be performed on the equipment provided under this section. All tests shall be performed under simulated field conditions in accordance with the latest version of UL and NEMA standards.
 - 1. All printed circuit boards shall be functionally tested via automatic test equipment prior to unit installation.
 - 2. All inverter power sub-assemblies shall undergo a burn-in test.
 - 3. After all pre-tests have been performed, each complete VFD shall undergo a burn-in test. The drive shall be burned in with a motor load without an unscheduled shutdown.
- B. Submit final VFD test reports under the provisions of Section III 2.2.

3.4 STARTUP SERVICES

- A. The Manufacturer shall coordinate start-up services with the Installing Contractor.
- B. Installation of the VFD's will be staged. The Manufacturer will be required to

provide a minimum of one (1) 8-hour trip for each VFD.

- C. The Manufacturer shall provide start-up commissioning of the VFD and its optional circuits by a factory certified service technician who is experienced in start-up and repair services. The commissioning personnel shall be the same personnel that will provide the factory service and warranty repairs at the customer's site. Sales personnel and other agents who are not factory certified technicians for VFD field repair shall not be acceptable as commissioning agents. Start-up services shall include checking for verification of proper operation and installation for the VFD, its options and its interface wiring to the building automation system. Three (3) copies of the Start-Up Report shall be included in the close-out documents.
- D. The start-up report shall include the following information in addition to the Manufacturer's standard information:
 - 1. Motor amp and kW at low limit and high limit speeds.
 - 2. Acceleration and deceleration settings.

3.5 ADJUSTING

- A. Program microprocessors for required operational sequences, status indications, alarms, event recording, and display features. Clear events memory after final acceptance testing and prior to Substantial Completion.
- B. Set field-adjustable switches, auxiliary relays, time-delay relays, timers, and overload-relay pickup and trip ranges.
- C. Adjust the trip settings of MCPs and thermal-magnetic circuit breakers with adjustable, instantaneous trip elements. Initially adjust to six times the motor nameplate full-load amperes and attempt to start motors several times, allowing for motor cool-down between starts. If tripping occurs on motor inrush, adjust settings in increments until motors start without tripping. Do not exceed eight times the motor full-load amperes (or 11 times for NEMA Premium Efficient motors if required). Where these maximum settings do not allow starting of a motor, notify Engineer before increasing settings.
- D. Set the taps on reduced-voltage autotransformer controllers.
- E. Set field-adjustable pressure switches.

3.6 PROTECTION

- A. Replace VFD's whose interiors have been exposed to water or other liquids prior to installation.

3.7 DEMONSTRATION

- A. A factory-authorized service representative shall train Owner's maintenance personnel to adjust, operate, reprogram, and maintain VFD's at the time of the equipment commissioning. This may be combined with start-up services.

END OF SECTION

IX – Exhibits

VFD Procurement for Cherry Valley Lift Station Pump Replacement Capital Project No. 1911

Motor Data from Grundfos Submittal (11 pages)

Cherry Valley Pump Station Upgrade Phase 1 Improvements (Capital Project No. 1032)

Sheet E-4, Electrical Upper Floor Plan – El 742.81

Sheet E-6, Electrical One-Line Diagram

Sheet E-8, Electrical Schedules

NIDEC MOTOR CORPORATION

8050 WEST FLORISSANT AVE.
ST. LOUIS, MO 63136



DATE: 3/22/2019

P.O. NO.: 4511756426
Order/Line NO.: 20182550 SO 100

TO: GRUNDFOS WATER UTILITY INC
Yeomans Chicago Corp
P O Box 6620
Aurora, IL, 60598-0620

ATTN: SOHEB MOMIN

Model Number: NA
Catalog Number:
Titan VSS-NT TEFC
CONF,MOTOR,TITAN VSS-NT TEFC

REVISIONS:
(NONE)

MARKS: 99603246

ALL DOCUMENTS HEREIN ARE CONSIDERED CERTIFIED BY NIDEC MOTOR CORPORATION.
THANK YOU FOR YOUR ORDER AND THE OPPORTUNITY TO SERVE YOU.

Features:

HOLD PRODUCTION
Horsepower 00400.00~00000.00 ~ KW: 298.4
Enclosure TEFC
Poles 06~00 ~ RPM: 1200~0
Frame Size 580Y-P
Phase/Frequency/Voltage.. 3~060~460
Winding Type Random Wound
Service Factor 1.15
Insulation Class Class "F" ~ VPI-2000
Altitude In Feet (Max) .. 3300 Ft.(1000 M)
Ambient In Degree C (Max) +40 C
Efficiency Class Premium Efficiency
Application Vertical Centrifugal Pump
Inverter Duty NEMA MG1 Part 31
Customer Part Number
Base Diameter (Inches) 30.5
Pricebook Thrust Value (lbs).. 1930
Customer Down Thrust (lbs) ... 1
Customer Shutoff Thrust (lbs).
Up Thrust (lbs)
Inverter Duty Rating Details:
Load Type (Base Hz & Below) .. Variable Torque
Speed Range (Base Hz & Below). 10:1
"AK" Dimension (Inches).. NA
Shaft Dimensions:~U=2.625 ~ AH/V=5.000
KEYWAY=0.625 ~ ES=3.500
Temperature Rise (Sine Wave): "F" Rise @ SF (Resist)
Starting Method Direct-On-Line Start
Duty Cycle Continuous Duty
Efficiency Value 95.4 % ~ Guaranteed
Load Inertia: NEMA ~ Standard Inertia: 4199 LB-FT2
Number Of Starts Per Hour: NEMA
Motor Type Code JVEI
Rotor Inertia (LB-FT²) 242. LB-FT²
Qty. of Bearings PE (Shaft) 1
Qty. of Bearings SE (OPP) 1
Bearing Number PE (Shaft) 6226-J/C3
Bearing Number SE (OPP) 6226-Z-J/C3

Nidec trademarks followed by the * symbol are registered with the U.S. Patent and Trademark Office.

NIDEC MOTOR CORPORATION

8050 WEST FLORISSANT AVE.
ST. LOUIS, MO 63136



DATE: 3/22/2019

P.O. NO.: 4511756426
Order/Line NO.: 20182550 SO 100

TO: GRUNDFOS WATER UTILITY INC
Yeomans Chicago Corp
P O Box 6620
Aurora, IL, 60598-0620
ATTN: SOHEB MOMIN

Model Number: NA
Catalog Number:
Titan VSS-NT TEFC
CONF, MOTOR, TITAN VSS-NT TEFC

REVISIONS:
(NONE)

MARKS: 99603246

**ALL DOCUMENTS HEREIN ARE CONSIDERED CERTIFIED BY NIDEC MOTOR CORPORATION.
THANK YOU FOR YOUR ORDER AND THE OPPORTUNITY TO SERVE YOU.**

Accessories:

Ground Lug In Conduit Box
Inpro/Seal Ground Ring CDR
Insul. Bearing - Upper Bracket
Special Balance
Siemens T-Sentry 115/230V SMSE
ATA Vib. Detect/Prox Probe:
Vib Det/Prox Probe Type ATOE
Manufacturer ATOE
Manufacturer's Part Number.. ATOE
Q-1 Upper/Short End Bracket
Mounting Arrangement SE Std. Mounting Position
No Vib Detect On Lower/PE Brk
Mounting Arrangement PE
Total Qty Of Detectors 1
Q-1 Accessory Outlet Box ~ Opposite Side of Main O/B
3/4" NPT Conduit Opening
Test Requirements:
Complete Initial Test-Unwit.

USE THE DATA PROVIDED BELOW TO SELECT THE APPROPRIATE DIMENSION PRINT

Horsepower	400
Pole(s)	06
Voltage(s)	460
Frame Size	5807P
Shaft U Diameter	2.625
Outlet Box AF	10.94
Outlet Box AA	3.50
Accessory Outlet Box DM	0.75

Nidec trademarks followed by the ® symbol are registered with the U.S. Patent and Trademark Office.

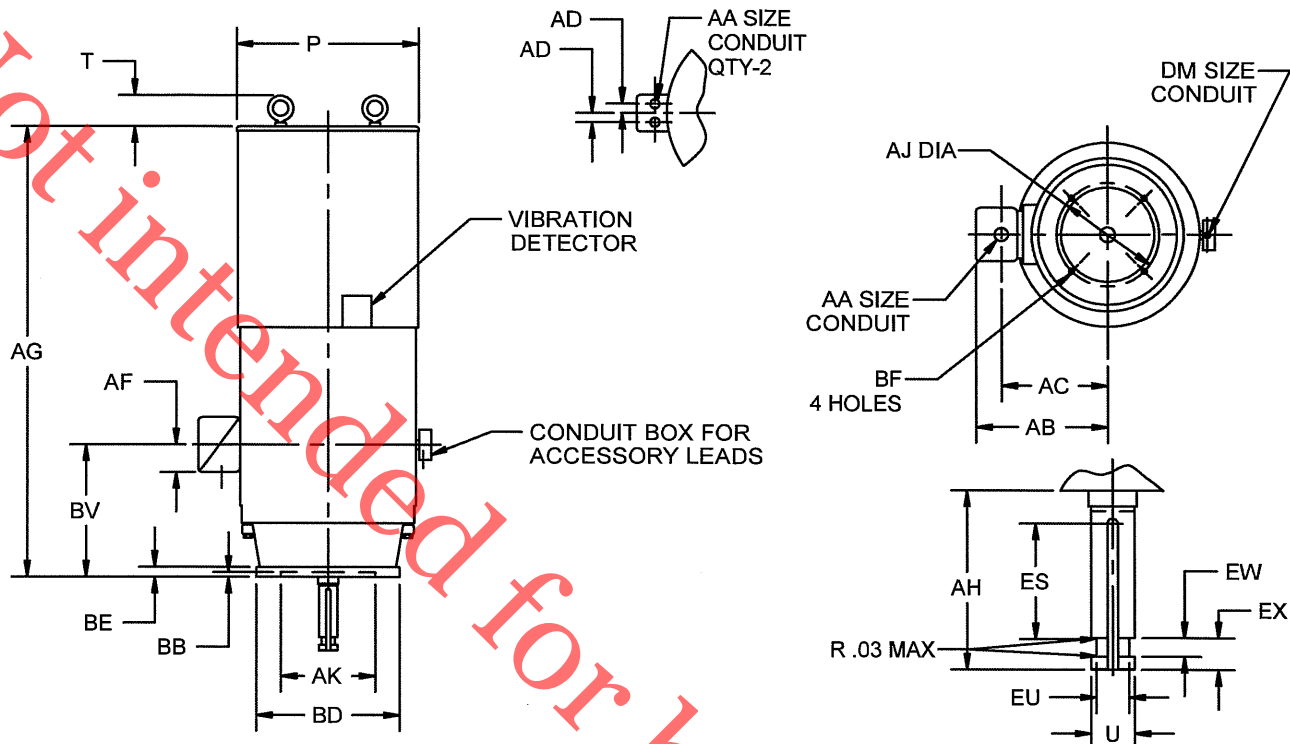
EFFECTIVE:
20-JAN-15

SUPERSEDES:
13-JUL-05

DIMENSION PRINT
WITH STYLE "P" BASE
FRAME: 5807P THRU 5811PH
BASIC TYPE: JV

PRINT:
09-2549-09

SHEET:
1 OF 1



ALL DIMENSIONS ARE IN INCHES

FRAME	HP	VOLTS	AB	AC	AD	AF
5800	THRU 500	460	26.13	20.63	-	8.06
	ALL	2300				
	OVER 500	460	32.00	25.38	3.00	10.94
	ALL	4000				

AA	DM
3 NPT	3/4 NPT
3 1/2 NPT	1 NPT
4 NPT	1 1/2 NPT

FRAME	AG	FRAME	P	T	AJ	AK +.005	BB MIN	BD MAX	BE	BF	BV	XP
5807	57.00	5800P	31.13	4.00	26.000	22.000	.25	30.50	1.25	.81	16.75	17.63
5809	64.00	5800PH			14.750	13.500		24.50		.69		
5811	72.00				22.000			.94				

	POLES(RPM)				U	AH	ES	EU	EW	EX	SQ
	2(3600)	4(1800)	6(1200)	8(900)	-.001	±.062	MIN	-.005	+.002	-.005	KEY
HP	ALL THRU 600	ALL THRU 300	ALL THRU 200	ALL THRU 150	2.125	4.500	3.00	1.750	0.375	0.750	.500
	—	350 THRU 450	250 THRU 300	200	2.375	5.000	3.50	2.000	0.375	0.750	.625
	—	500 THRU 600	350 THRU 400	250 THRU 300	2.625	5.000	3.50	2.250	0.375	0.750	.625
	—	700 THRU 800	450 THRU 500	350 THRU 400	2.875	7.000	5.00	2.375	0.500	1.000	.750
	—	—	600	450 THRU 500	3.125	7.000	5.00	2.625	0.500	1.000	.750

	POLES(RPM)				U	AH	ES	EU	EW	EX	SQ
	10(720)	12(600)	14(514)	16(450)	-.001	±.062	MIN	-.005	+.002	-.005	KEY
HP	ALL THRU 125	ALL THRU 100	ALL THRU 75	ALL THRU 75	2.125	4.500	3.00	1.750	0.375	0.750	.500
	150	125 THRU 150	100 THRU 125	100	2.375	5.000	3.50	2.000	0.375	0.750	.625
	200	200	150	125 THRU 150	2.625	5.000	3.50	2.250	0.375	0.750	.625
	250 THRU 300	250	200	200	2.875	7.000	5.00	2.375	0.500	1.000	.750
	350 THRU 400	300	250	250	3.125	7.000	5.00	2.625	0.500	1.000	.750

1. DIMENSIONS MAY VARY BY +/- .25" DUE TO CASTING AND/OR FABRICATION VARIATIONS.
2. CONDUIT OPENINGS MAY BE LOCATED IN STEPS OF 90 DEGREES. STANDARD IS AS SHOWN WITH CONDUIT OPENINGS DOWN.

TOLERANCES	
FACE RUNOUT	.007 F.I.R.
PERMISSIBLE ECCENTRICITY OF MOUNTING RABBET	.007 F.I.R.
PERMISSIBLE SHAFT RUNOUT	.003 F.I.R.
MAXIMUM SHAFT END PLAY	.010

09-2549/A

Nidec Motor Corporation
St. Louis, Missouri

INFORMATION DISCLOSED ON THIS DOCUMENT IS CONSIDERED PROPRIETARY AND SHALL NOT BE REPRODUCED OR DISCLOSED WITHOUT WRITTEN CONSENT OF NIDEC MOTOR CORPORATION



ISSUED BY
K. FRIEDMAN
APPROVED BY
K. POTTER
Page 44 of 56

IHP_DP_NMCA (MAR-2011) SOLIDEDGE

NAMEPLATE DATA

CATALOG NUMBER: _____		NAMEPLATE PART #: <u>422707-006</u>	
MODEL _____	FR <u>5807P</u>	TYPE <u>JVEI</u>	ENCL <u>TEFC</u>
SHAFT END BRG <u>6226-J/C3 - QTY 1</u>		OPP END BRG <u>6226-Z-J/C3 - QTY 1</u>	
PH <u>3</u>	MAX AMB <u>40 C</u>	ID# _____	(ref: Order#: 20182550, Type: SO, Line#: 100)
INSUL CLASS <u>F</u>	Asm. Pos. _____	DUTY <u>CONT</u>	
HP <u>400</u>	RPM <u>1190</u>	HP _____	RPM _____
VOLTS <u>460</u>		VOLTS _____	
FL AMPS <u>469.0</u>		FL AMPS _____	
SF AMPS <u>536.0</u>		SF AMPS _____	
SF <u>1.15</u>	DESIGN <u>#</u>	CODE <u>G</u>	
NEMA NOM EFFICIENCY <u>96.2</u>	NOM PF <u>83.1</u>	KiloWatt <u>298.4</u>	
GUARANTEED EFFICIENCY <u>95.4</u>	MAX KVAR _____	HZ <u>60</u>	

HAZARDOUS LOCATION DATA (IF APPLICABLE):

DIVISION _____	CLASS I _____	GROUP I _____
TEMP CODE _____	CLASS II _____	GROUP II _____

VFD DATA (IF APPLICABLE):

VOLTS <u>460</u>	
AMPS <u>492.5</u>	
TORQUE 1 <u>1766LB-FT</u>	TORQUE 2 _____
VFD LOAD TYPE 1 <u>VT/PWM</u>	VFD LOAD TYPE 2 _____
VFD HERTZ RANGE 1 <u>6-60</u>	VFD HERTZ RANGE 2 _____
VFD SPEED RANGE 1 <u>120-1200</u>	VFD SPEED RANGE 2 _____
SERVICE FACTOR <u>1.00</u>	FL SLIP _____
NO. POLES _____	MAGNETIZING AMPS _____
VECTOR MAX RPM _____	Encoder PPR _____
Radians / Seconds _____	Encoder Volts _____

TEAO DATA (IF APPLICABLE):

HP (AIR OVER) _____	HP (AIR OVER M/S) _____	RPM (AIR OVER) _____	RPM (AIR OVER M/S) _____
FPM AIR VELOCITY _____	FPM AIR VELOCITY M/S _____	FPM AIR VELOCITY SEC _____	



ADDITIONAL NAMEPLATE DATA:

Decal / Plate	WD=499495	Customer PN	
Notes		Non Rev Ratchet	
Max Temp Rise		OPP/Upper Oil Cap	GREASE
Thermal (WDG)	OVER TEMP PROT 1	SHAFT/Lower Oil Cap	GREASE
Altitude		Usable At	
Regulatory Notes		Regulatory Compliance	CC 030A
COS		Marine Duty	
Balance	0.08 IN/SEC	Arctic Duty	
3/4 Load Eff.	96.2	Inrush Limit	
Motor Weight (LBS)	5180	Direction of Rotation	
Sound Level		Special Note 1	
Vertical Thrust (LBS)	1930	Special Note 2	
Thrust Percentage	NORMAL	Special Note 3	
Bearing Life		Special Note 4	
Starting Method		Special Note 5	
Number of Starts		Special Note 6	
200/208V 60Hz Max Amps		SH Max. Temp.	
190V 50 hz Max Amps		SH Voltage	
380V 50 Hz Max Amps		SH Watts	
NEMA Inertia		Load Inertia	
Sumpheater Voltage		Sumpheater Wattage	
Special Accessory Note 1		Special Accessory Note 16	
Special Accessory Note 2		Special Accessory Note 17	
Special Accessory Note 3		Special Accessory Note 18	
Special Accessory Note 4		Special Accessory Note 19	
Special Accessory Note 5		Special Accessory Note 20	
Special Accessory Note 6		Special Accessory Note 21	
Special Accessory Note 7		Special Accessory Note 22	
Special Accessory Note 8		Special Accessory Note 23	
Special Accessory Note 9		Special Accessory Note 24	
Special Accessory Note 10		Special Accessory Note 25	
Special Accessory Note 11		Special Accessory Note 26	
Special Accessory Note 12		Special Accessory Note 27	
Special Accessory Note 13		Special Accessory Note 28	
Special Accessory Note 14		Special Accessory Note 29	
Special Accessory Note 15		Special Accessory Note 30	
Heater in C/B Voltage		Heater in C/B Watts	
Zone 2 Group		Division 2 Service Factor	
Note 1		Note 2	
Note 3			

**NIDEC MOTOR CORPORATION
ST. LOUIS, MO**

TYPICAL NAMEPLATE DATA
ACTUAL MOTOR NAMEPLATE LAYOUT MAY VARY
SOME FIELDS MAY BE OMITTED

Nidec trademarks followed by the ® symbol are registered with the U.S. Patent and Trademark Office.



MOTOR PERFORMANCE

MODEL NO.	CATALOG NO.	PHASE	TYPE	FRAME
NA	NA	3	JVEI	5807P
ORDER NO.		20182550	LINE NO.	100
MPI:				258609
HP:				400
POLES:				6
VOLTS:				460
HZ:				60
SERVICE FACTOR:				1.15
EFFICIENCY (%):				
S.F.				96
FULL				96.2
3/4				96.2
1/2				95.5
1/4				92.4
POWER FACTOR (%):				
S.F.				83.6
FULL				83.1
3/4				80.4
1/2				72.9
1/4				52.7
NO LOAD				4.4
LOCKED ROTOR				20
AMPS:				
S.F.				536
FULL				469
3/4				363
1/2				269
1/4				192
NO LOAD				155.7
LOCKED ROTOR				3110.8
NEMA CODE LETTER				G
NEMA DESIGN LETTER				#
FULL LOAD RPM				1190
NEMA NOMINAL / EFFICIENCY (%)				96.2
GUARANTEED EFFICIENCY (%)				95.4
MAX KVAR				105.4
AMBIENT (°C)				40
ALTITUDE (FASL)				3300
SAFE STALL TIME-HOT (SEC)				30
SOUND PRESSURE (DBA @ 1M)				85
TORQUES:				
BREAKDOWN{% F.L.}				230
LOCKED ROTOR{% F.L.}				100
FULL LOAD{LB-FT}				1766

NEMA Nominal and Guaranteed Efficiencies are up to 3,300 feet above sea level and 25 ° C ambient

The Above Data Is Typical. Sinewave Power Unless Noted Otherwise

NIDEC MOTOR CORPORATION
ST. LOUIS, MO

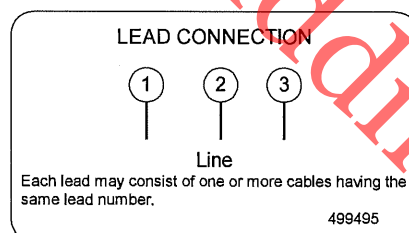
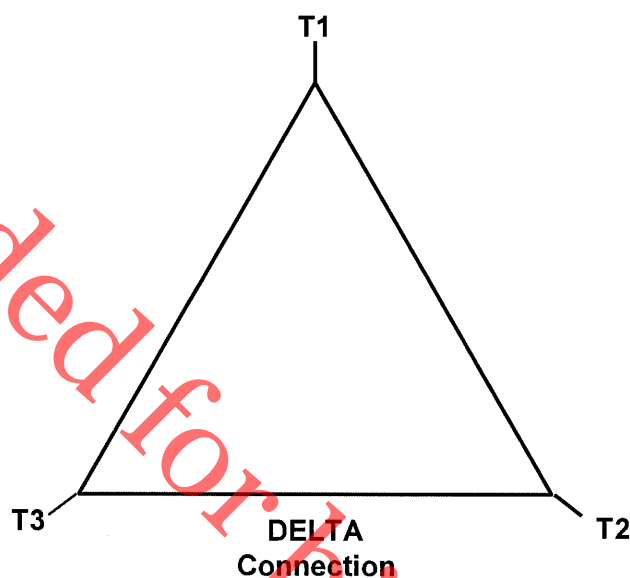


Nidec trademarks followed by the ® symbol are registered with the U.S. Patent and Trademark Office.



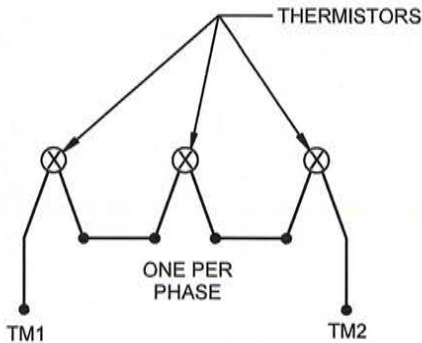
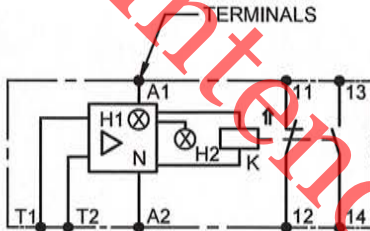
499495

Motor Wiring Diagram



To reverse direction of rotation interchange connections L1 and L2.
Each lead may be comprised of one or more cables.
Each cable will be marked with the appropriate lead number.

THERMASENTRY THERMISTORS



1. THERE ARE QTY-3 POSITIVE TEMPERATURE COEFFICIENT (PTC) THERMISTORS (1 PER PHASE) INSTALLED IN THE MOTOR WINDING. ONE PER PHASE, CONNECTED IN SERIES. TERMINATED ON TERMINAL STRIP TERMINALS T1 AND T2 IN THE MOTOR ACCESSORY CONNECTION BOX. THESE ARE TO BE WIRED TO THE REMOTE-MOUNTED CONTROL MODULE SUPPLIED WITH THE MOTOR. WIRE THE THERMISTOR LEADS TM1 AND TM2 TO THE MODULE TERMINALS T1 AND T2.

2. WIRE CONTROL POWER TO MODULE TERMINALS A1 AND A2. CONTROL POWER MAY BE 24 TO 240 VOLTS AC OR DC.

3. FOR NORMALLY OPEN CONTACTS, USE MODULE TERMINALS 13 AND 14.

4. FOR NORMALLY CLOSED CONTACTS, USE MODULE TERMINALS 11 AND 12.

NOTES:

1. OUTPUT CONTACT RATING IS:

AC 240 VOLTS 3 AMPERES MAXIMUM

DC 24 VOLTS 1 AMPERE MAXIMUM

2. DO NOT APPLY POWER DIRECTLY ACROSS 11 AND 12 OR 13 AND 14.

3. THE MODULE AUTOMATICALLY RESETS ITSELF WHEN TEMPERATURE DROPS TO A SAFE LEVEL.

TYPICAL CONNECTION DIAGRAM, REMOTE MOUNTED THERMASENTRY WITH N.O. AND N.C. CONTACTS

ACCESSORY LISTING

QTY. 1 - SIEMENS THERMASENTRY CONTROL MODULE N.O./N.C.

QTY. 3 - THERMASENTRY THERMISTORS

ITEMS AND MATERIALS SPECIFIED HEREIN MUST COMPLY WITH THE EUROPEAN REDUCTION OF HAZARDOUS SUBSTANCES (ROHS 3) DIRECTIVE 2011/65/EU, REGULATIONS (EC) NO. 1907/2006 (REACH) AS OF 1 JUNE 2007, CALIFORNIA PROP 65 AND ALL SUBSEQUENT UPDATES. PLEASE REFER TO THE OFFICIAL DOCUMENTS FOR COMPLETE DEFINITIONS AND LIMITS FOR ALL RESTRICTED SUBSTANCES UNDER ROHS 3, REACH AND CALIFORNIA PROP 65.

NIDEC CONFIDENTIAL
NIDEC MOTOR CORPORATION 19-DEC-18

NMCA (OCT-2013)

REVISION DESCRIPTION FOR: 18703356

CHANGED TERMINALS IN NOTES 11 WAS 95,
12 WAS 96, 13 WAS 97, 14 WAS 98.

MATERIAL:

SCALE

NONE

UNITS

INCHES

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

INCHES

mm

ANGLES X°= ±1°

TITLE

**DRAWING, CUSTOMER
CONNECTION DIAGRAM**

ISSUED BY

R. LOPEZ

APPROVED BY

M. RAMIREZ

CODE

DWG NO.

0625703

**NIDEC MOTOR
CORPORATION**

REVISION DATE

20-DEC-18

REV

SHEET

NUMBER

1 OF 1

DWG

SIZE

A

SOLIDEAGE



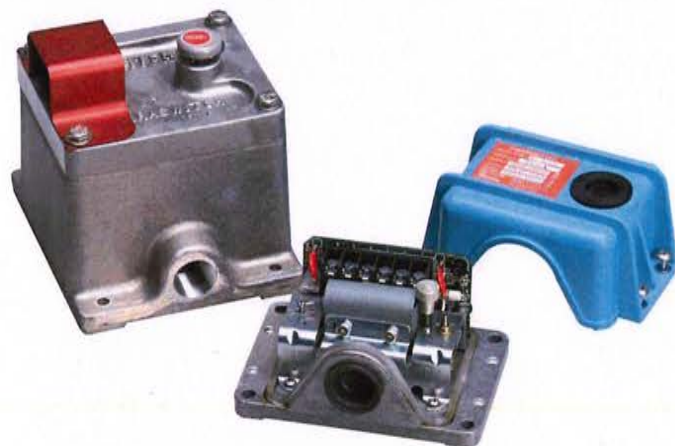
Model 375A/376A
Vibraswitch® Malfunction
Detectors

General Description

These Robertshaw Vibraswitch Malfunction Detectors are acceleration sensitive vibration instruments with electronic circuitry to provide maximum protection to rotating and reciprocating machinery due to damages resulting from mechanical malfunctions. Although identical in outside appearance and dimensionally the same as the existing Models 365 and 366, these instruments include "built-in" electronic circuitry for start and/or monitoring time delay functions for the prevention of false shutdowns resulting from transient vibrations. All models include provisions for remote reset.

"Start Delay" is often required on machines that start automatically and exhibit excessive vibration for short periods of time only during starting. Proper set point adjustment on the Vibraswitch for adequate protection during normal running conditions may cause the Vibraswitch to "trip" as the instrument senses these high starting transient vibrations without the use of "Start Delay." Examples of such machines are refrigeration compressors and high-speed turbines.

"Monitor Delay" is required on machines that exhibit excessive vibration of a transient nature which occurs during normal operation. If a Vibraswitch without monitor delay has its set point sufficiently high so as not to trip-out under the transient vibration levels, inadequate protection would result during the normal running conditions. Examples of this type machine include liquid pumps that experience momentary cavitations resulting in excessive vibration.



Features and Benefits:

- **Complete Vibration Protection in a Single Package**
Reasonably priced, lower installation costs
- **Explosion Proof Model (375A)**
FM Approved
InMetro Approved
- **Weather Proof Model (376A)**
NEMA 4
NEMA 4X (optional)
- **Acceleration Sensitive**
Measures destructive forces
- **Selectable Time Delay Control Options**
Permits maximum application flexibility
- **Ease of Adjustment**
Set it and forget it – one adjustment
- **Continuous Reliable Protection**
No attention required after installation
- **Solid State Switching**
Alarm or shutdown voltage completely isolated from instrument supply

Principle of Operation

The Model 375A and 376A Vibraswitches employ a magnetic circuit opposed by inertial and adjustable spring forces in the actuating mechanism. Operation of the unit may be understood by reference to Figure 1

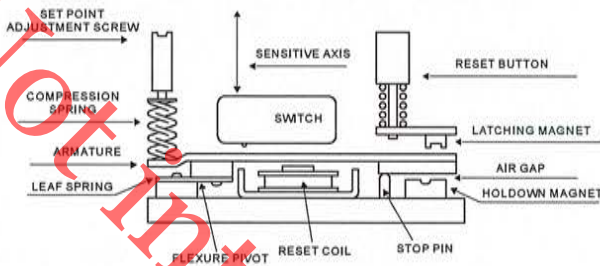


FIGURE 1

The armature is constrained so as to respond to only a single direction of motion, by a frictionless flexure pivot composed of two overlapping blocks with a leaf spring loaded in one direction to hold the blocks together. The armature rotates about the pivot, being forced in one direction by the adjusting spring force and the other direction by the magnetic force.

When the entire assembly is subjected to vibration perpendicular to the base, the peak acceleration times the effective mass of the armature produces an inertial force, aided by the adjustable spring tending to force the armature away from the stop pin and the restraining force of the magnet. When the peak acceleration exceeds the set point level, the armature leaves the stop pin, increasing the air gap and decreasing the magnetic force with the armature continuing to move up until it reaches the latch magnet, actuating the switch during its upward travel. The effect of temperature in the mechanism is negligible as the elastic modulus of the adjusting spring and magnetic flux through the air gap both decrease slightly with increasing temperature thereby compensating each other.

Electronic Operation

"Start Delay Only" models hold the Vibraswitch armature in its "reset" position for a preset starting time after application of supply voltage to the instrument. This prevents the Vibraswitch from tripping out during machine startup. Fixed timing periods of 15, 30, 60 or 90 seconds are available. After the time period, the Vibraswitch functions as normal with shutdown or alarm functions provided by utilizing the SPDT switch contacts in the unit.

"Monitor Delay Only" models prevent nuisance shutdowns due to tripping-out of the Vibraswitch during high level short term transient vibration conditions by automatically resetting the Vibraswitch. Under continuing high vibration, the Vibraswitch trips, is immediately reset, trips out again and is reset; this "sampling" process continuing until the time delay period has elapsed, after

which the unit remains "tripped" out. An AC output by means of a solid state "TRIAC" switch can be used for either ALARM or SHUTDOWN. The "TRIAC" switch can be set for either NO or NC operation by repositioning the jumper plug located on the circuit board.

"Start and Monitor Delay" models provide the control functions of both START delay and MONITOR delay in a single instrument. The "Start and Monitor Delay" models employ the same "TRIAC" switch found in the "Monitor Delay Only" models.

Specifications

Enclosure:

375A	Aluminum, unpainted (standard) FM Approved for Class I, Division 1, Groups C & D; Class II, Division 1, Groups E, F & G hazardous locations Aluminum, epoxy painted (optional)
376A	Aluminum base, unpainted (standard) with ABS thermoplastic cover & Kraton thermoplastic gasket, NEMA 4. Epoxy painted base (optional), NEMA 4X

Switch Contacts:

Start Delay Only Models:

SPDT (dry contacts)
5 A at 120 or 240 VAC

Monitor or Start & Monitor Delay Models:

SPST Triac (solid state contacts)
2 A maximum, 50 mA minimum at
120 VAC only (will not switch DC)
Field selectable for NO or NC operation

Set Point Range:

Mounted Horizontal 0 to 4.5 G (peak)
Mounted Vertical 0 to 3.5 G (peak)

Frequency Range

..... 0 to 300 Hz

Set Point Adjustment

..... 1 G per turn (approximate)

Temperature limits:

Storage -40° to +160° F (-40° to +71° C)

Operating -20 to +140° F (-29° to +60° C)

Shock 75 G @ 11 ms maximum

Supply Voltage: 120 VAC ±10%, 50/60 Hz

Supply Power: 15 W maximum

Delay Time Accuracy: ±30%

Net weight:

375A 6.5 lbs (2.9 kg)

376A 2.25 lbs (1 kg)

Shipping weight:

375A 7 lbs (3.2 kg)

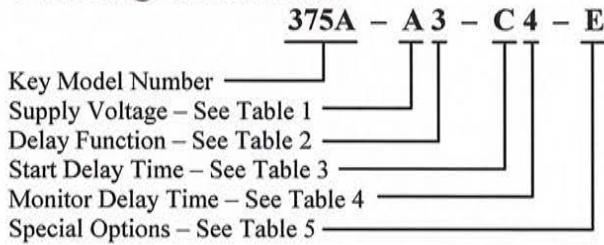
376A 3 lbs (1.4 kg)

Agency Certification:

375A FM Files 0Q7A3.AE & 0R1H7.AE

376A None

Ordering Information



Key Model Number

Designation	Description
375A	Explosion Proof Vibraswitch, FM Certified
376A	Weather Proof Vibraswitch, NEMA 4

Table 1 – Supply Voltage

Designation	Description
A	120 VAC ±10%, 50/60 Hz

Table 2 – Delay Function

Designation	Description
1	Start Delay Only
2	Monitor Delay Only
3	Start & Monitor Delay

Table 3 – Start Delay Time

Designation	Description
A	None
C	15 Seconds
D	30 Seconds
E	60 seconds
F	90 Seconds

Table 4 – Monitor Delay Time

Designation	Description
0	None
2	2 Seconds
3	5 Seconds
4	10 Seconds

Table 5 – Special Options

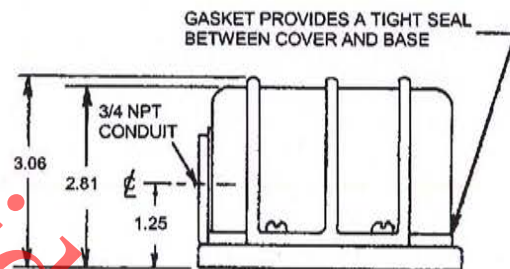
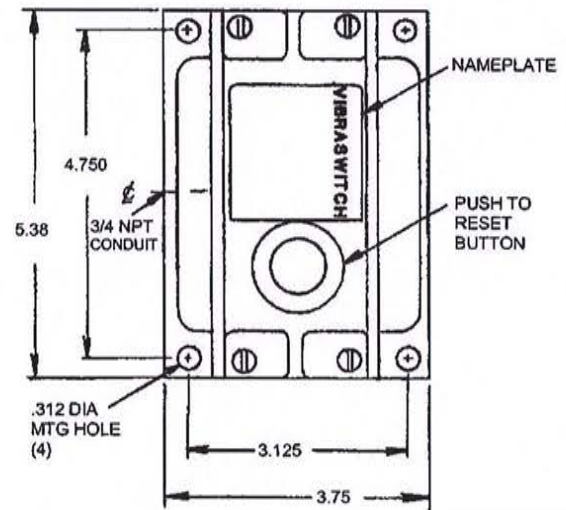
Designation	Description
Omit	No special options
	For the 375A – Epoxy painted enclosure
E	For the 376A – Epoxy painted base, NEMA 4X

Accessory Items

(Must be ordered separately)

Part no.	Description
904GB016	Rain shield for unprotected outdoor installations, steel, zinc plated
904GB016-03	Rain shield, steel, zinc plated and painted with gray epoxy enamel.

Model 376A Dimensions

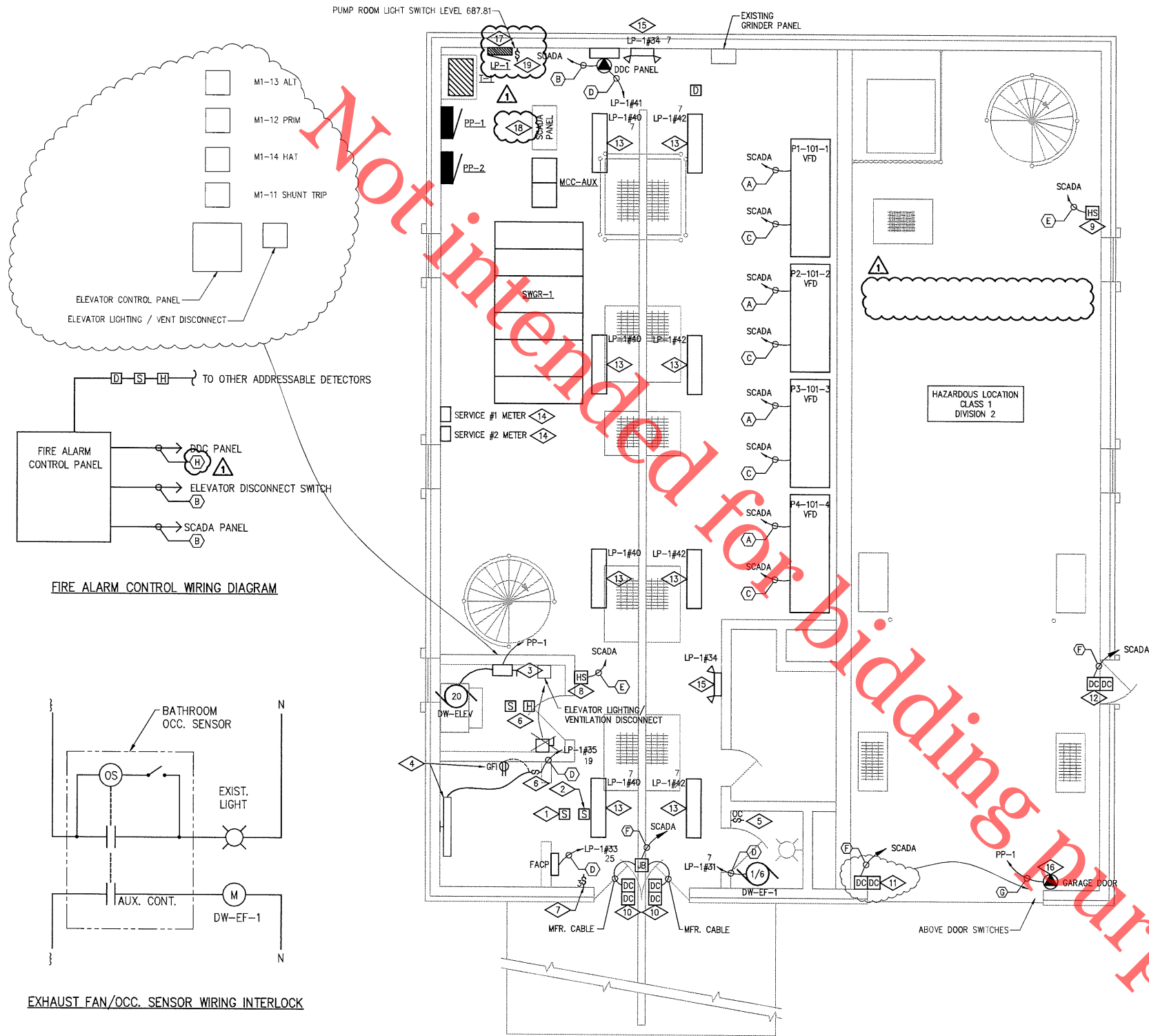


DIRECTION OF SENSITIVITY
TO VIBRATION
(PEAK ACCELERATION)

Note:

The mechanical reset pushbutton on the Vibraswitch will only reset the mechanical portion of the Vibraswitch and will not re-initiate the Start and/or Monitor Delay function and will not reset the solid state switch. The mechanical reset is normally only used when adjusting the set point.

M:\ACAD\DATA\SHARE\CVLS_1032 Rec'd Dwg\CVLS_077_20110101.dwg Jan 04, 2013 -- 11:50am kyleg



GENERAL NOTES:

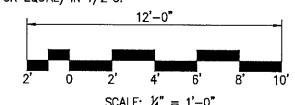
- ELECTRICAL LAYOUT DRAWINGS SHOW GENERAL EQUIPMENT AND FACILITY LAYOUT. REFER TO ARCHITECTURAL, STRUCTURAL, MECHANICAL, AND HVAC DRAWINGS FOR DIMENSIONS, CEILING HEIGHTS, ROOM FINISHES, ETC. INSTALL ELECTRICAL SYSTEMS WITHOUT INTERFERENCE TO THE WORK OF OTHER DISCIPLINES.
- CAREFUL COORDINATION BETWEEN DISCIPLINES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSURE A COMPLETE INSTALLATION CONFORMING TO THE PLANS AND SPECIFICATIONS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY CONDUIT, CONDUCTORS, AND WIRING DEVICES FOR EQUIPMENT SHOWN. COORDINATE REQUIREMENTS WITH P&IDS, SPECIFICATIONS, AND MANUFACTURER INSTALLATION INSTRUCTIONS.
- REFER TO ONE-LINE RISER DIAGRAM AND EQUIPMENT SCHEDULE FOR CONNECTION INFORMATION.
- CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL LAMPS FOR NEW LUMINAIRES.

KEYED NOTES:

- MOUNT SMOKE DETECTOR TO UNDERSIDE OF ELEVATOR SOFFIT WITHIN 5 FEET OF ELEVATOR DOOR.
- MOUNT SMOKE DETECTOR AT CEILING.
- PROVIDE BUSSMANN POWER MODULE SWITCH CAT#PS-6-T48-R2-KG-A-F3 AND CONNECT TO ELEVATOR MOTOR. MOTOR IS RATED FOR 31FLA @ 480V.
- MOUNT LIGHT FIXTURE, SWITCH AND RECEPTACLE 36" ABOVE TOP OF ELEVATOR CAR. LIGHT FIXTURE SHALL BE DAY-BRITE TYPE V2WAE232-120-1/2EB OR EQUAL.
- REPLACE EXISTING SWITCH WITH AN OCCUPANCY SENSOR (WATTSTOPPER WS-250-W OR EQUAL). REFER TO WIRING DIAGRAM BELOW FOR INTERCONNECTION BETWEEN EXISTING BATHROOM LIGHT FIXTURE, NEW OCCUPANCY SENSOR AND NEW EXHAUST FAN.
- PROVIDE HEAT AND SMOKE DETECTORS IN EXISTING ELEVATOR EQUIPMENT ROOM. HEAT DETECTOR SHALL BE INTERCONNECTED TO BUSSMANN POWER MODULE SO THAT UPON ALARM, THE HEAT DETECTOR SHALL SHUNT TRIP THE FUSIBLE SWITCH SERVING THE ELEVATOR.
- LIGHT SWITCH SHALL CONTROL STEP LIGHTS AND WALL SCONCES SHOWN ON SHEET E-1.
- PROVIDE ALLEN-BRADLEY MODEL 800T (OR EQUAL) RED, ILLUMINATED, 60MM LED (24V) MUSHROOM HEAD PUSHBUTTON (PUSH/PULL OPERATION) AND ASSOCIATED MOUNTING ADAPTER, SURFACE MOUNTED JUNCTION BOX AND ALL NECESSARY ACCESSORIES FOR THE 'MAN DOWN' ALARM. REFER TO WIRING DIAGRAM ON SHEET E-2.
- PROVIDE ALLEN-BRADLEY MODEL 800H (OR EQUAL) EXPLOSION-PROOF RED MUSHROOM HEAD PUSHBUTTON (MOMENTARY CONTACT) AND ASSOCIATED MOUNTING ADAPTER, SURFACE MOUNTED EXPLOSION PROOF JUNCTION BOX AND ALL NECESSARY ACCESSORIES FOR THE 'MAN DOWN' ALARM. REFER TO WIRING DIAGRAM ON SHEET E-2.
- PROVIDE GE SECURITY 1085 SERIES (OR EQUAL) SURFACE MOUNTED MAGNETIC DOOR SWITCH. REFER TO DETAIL 16700 FOR MOUNTING CONFIGURATION.
- PROVIDE GE SECURITY 2800T SERIES (OR EQUAL) SURFACE MOUNTED EXPLOSION PROOF MAGNETIC DOOR SWITCH. PROVIDE NECESSARY BRACKETS TO MOUNT ON EXISTING OVERHEAD DOOR AND EXTEND OFF EXISTING WALL AROUND OVERHEAD DOOR WHEEL TRACK IN ORDER TO KEEP SWITCH N.C. WHEN DOOR IS IN THE DOWN POSITION.
- PROVIDE GE SECURITY 2800T SERIES (OR EQUAL) SURFACE MOUNTED EXPLOSION PROOF MAGNETIC DOOR SWITCH. REFER TO DETAIL 16700 FOR MOUNTING CONFIGURATION.
- PROVIDE PENDANT MOUNTED LIGHT FIXTURE, LITHONIA MODEL IBC 454-WDS-GLR-BDP. FIXTURE SHALL BE MOUNTED AT 18'-0" AFF. PROVIDE 2#12, 1#12G. IN 3/4"C. BETWEEN LIGHT FIXTURES AND NEW PANEL LP-1. LIGHT FIXTURES SHALL BE OPERATED BY EXISTING LIGHT SWITCHES THAT WERE UTILIZED TO OPERATE THE FIXTURES THAT WERE REMOVED.
- PROVIDE METER SOCKET MEETING ELECTRIC UTILITY SPECIFICATIONS. PROVIDE 1" CONDUIT BETWEEN METER SOCKET AND ASSOCIATED SERVICE TRANSFORMER TERMINATION COMPARTMENT WHERE CTS WILL BE LOCATED AT. COORDINATE INSTALLATION OF CONDUIT WITH ELECTRIC UTILITY PRIOR TO INSTALLATION. PROVIDE NEW ANALOG TELEPHONE LINE IN 1/2"C. ENT. BETWEEN TELEPHONE SERVICE ENTRANCE BOX TO METER SOCKET FOR REMOTE ACQUISITION OF DATA.
- PROVIDE EMERGENCY LIGHTING UNIT, LITHONIA MODEL EU2 M6, WALL MOUNTED AT 8'-0" AFF. PROVIDE 2#12, 1#12G. IN 3/4"C. BETWEEN LIGHT FIXTURES AND NEW PANEL LP-1.
- PROVIDE 2#14, 1#14G. IN 3/4"C. BETWEEN EXISTING KEY SWITCH AND GARAGE DOOR OPERATOR. KEY SWITCH SHALL OPERATE GARAGE DOOR OPERATOR.
- EXISTING LOW-VOLTAGE PANEL LOCATED IN AUX MCC IS BEING REMOVED (REFER TO SHEET ER-4). INTERCEPT AND EXTEND ALL CIRCUITS, AT NEAREST ACCESSIBLE LOCATION, TO NEW PANEL LP-1.
- PROVIDE 10'-0" SLACK FOR ALL CONTROL CIRCUITS BEING ADDED, RE-ROUTED OR EXTENDED TO EXISTING SCADA SYSTEM FOR EASE OF TERMINATING CIRCUITS IN SCADA CABINET.
- PROVIDE MOMENTARY CONTACT SWITCH WITH INDICATING LIGHT. PROVIDE 2#14, 1#14G. IN 3/4"C. BETWEEN SWITCH AND DDC PANEL. COORDINATE LIGHT COLOR WITH OWNER.

WIRING LEGEND

- (A) = 4/2/C #18AWG STP IN 1"C.]
(B) = 4#14, 1#14G. IN 3/4"C.
(C) = 10#14, 1#14G. IN 3/4"C.
(D) = 2#12, 1#12G. IN 3/4"C.
(E) = 2#14, 1#14G. IN 3/4"C.
(F) = #20AWG 4/C UNSHIELDED (BELDEN 8404 OR EQUAL) IN 1/2"C.
(G) = 3#12, 1#12G. IN 3/4"C.
(H) = 4#14, 1#14G. IN 3/4"C.



UPPER FLOOR PLAN - EL 742.81
SCALE: 1/4"=1'-0"



6737 West Washington Street, Suite 3440
West Allis, Wisconsin 53214
(414)-291-8840
FAX 291-8841

• WASTEWATER TREATMENT/CONVEYANCE
• FACILITIES ENGINEERING
• ENVIRONMENTAL MANAGEMENT
• AIR QUALITY
• DESIGN/BUILD CONSTRUCTION MANAGEMENT
• INVESTIGATION, REMEDIATION & SITE CLOSURE
• PROCESS ENGINEERING

• WATER SUPPLY AND DISTRIBUTION
• SOLID AND HAZARDOUS WASTE MANAGEMENT
• WATER RESOURCES PLANNING/DESIGN
• STORM WATER MANAGEMENT
• GIS SERVICES
• BROWNFIELDS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DSGN JRH
DR JRH
CHK
APVD

CONSTRUCTION RECORD DRAWING
SUBMITTED BY STENSTROM
CONSTRUCTED 2011
1 02/11/11
NO. DATE REVISION
ADDENDUM NO. 1
BY JRH
ETM
APVD

CHERRY VALLEY PUMP STATION UPGRADE
PHASE 1 IMPROVEMENTS
(CAPITAL PROJECT NO. 1032)
ROCK RIVER WATER RECLAMATION DISTRICT
ROCKFORD, ILLINOIS 61109

ELECTRICAL
UPPER FLOOR PLAN - EL 742.81

SHEET NO. 63
DWG NO. E-4
DATE JAN 2011
PROJ NO. W101771

16-11-210

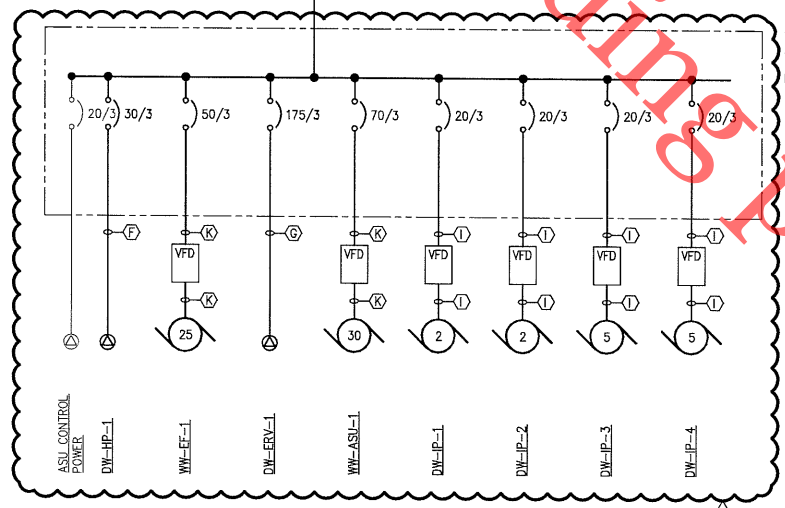
ELECTRICAL-UPPER FLOOR

DB 149

CVLS_077_20110101

PANELBOARD		PANEL "PF-2"	
NO.	Phase - Wire -	AMP	DATE 12/21/11
SOURCE			
1	ASU	750 A	2 ERV 175 A
3	Heat Pump	30 A	4 EF-1 50 A
5	Circulating Pump #1	15 A	6 Circulating Pump #3 15 A
7	Circulating Pump #2	15 A	8 Circulating Pump #4 15 A
9	Space		10 ASU Control Power 20 A
11	Space		12 Space
13	Space		14 Space
15			16
17			18
19			20
21			22
23			24
25			26
27			28
29			30
31			32
33			34
35			36
37			38
39			40
41			42

Circuit Directory provided by William Charles Electric @ (815) 877-8359



SWGR-1 ONE-LINE RISER DIAGRAM
SCALE: NONE

PP-2
600A, 480V, 3PH, 3W, 65KAIC
PROVIDE (4)-100A SPACES

MCC-AUX FEEDER	TVSS		TVSS	PP-2 FEEDER	800AF PROV.
800AF PROV.	MAIN	TIE	MAIN		PUMP 3 FEEDER
PUMP 2 FEEDER					PUMP 4 FEEDER
PUMP 1 FEEDER					GEN. SET FEEDER

SWGR-1 ELEVATION
SCALE: NONE

- WIRING LEGEND**
- (A) = 6[4-600KCM & 1-350KCM G. IN 4"C] & 2[4"C SPARES]
 - (B) = 6[4-400KCM, 1-350KCM G. IN 4"C] & 2[4"C SPARES]
 - (C) = 3-350KCM, 1#2 GND. IN 3" C
 - (D) = 2[3-350KCM, 1#2 GND. IN 3" C] 2[4-600 KCM]
 - (E) = 3#10, 1#10 GND. IN 3/4"C.
 - (F) = 3#2/0, 1#6 GND. IN 1 1/2"C.
 - (G) = 3#1, 1#6 GND. IN 1 1/4"C.
 - (H) = 3#12, 1#12 GND. IN 3/4"C.
 - (I) = 2[3-350KCM, 1#1 GND. IN 2 1/2" C]
 - (J) = 2#6, 1#6G. IN 1" C.

SCHEDULE OF PANELBOARDS table with columns: PANEL DESIGNATION, LOCATION, MAINS (AMPS), MAIN CIRCUIT BREAKER, MAIN LUGS ONLY, MOUNTING, KIC RATING (KA), TUB SIZE, 1P SPACES UNUSED, and BRANCH CIRCUIT BREAKERS (20A, 30A, 40A, 50A, 60A, 70A, 100A, 125A).

SCHEDULE OF PANELBOARDS GENERAL NOTES: 1. DOUBLE TUB PANEL. PROVIDE FIRST TUB WITH FEED THRU LUGS AND SECOND TUB WITH MLO. 2. TRIPLE TUB PANEL. PROVIDE FIRST TWO TUBS WITH FEED THRU LUGS AND THIRD TUB WITH MLO.

SCHEDULE OF PANELBOARDS SPECIFIC NOTES: 1. PROVIDE PANEL WITH FEED THRU LUGS. 2. PROVIDE INSULATED ISOLATE GROUND BUS. 3. PROVIDE PANEL WITH 200% NEUTRAL BUS. 4. PROVIDE GFEP 30mA CIRCUIT BREAKERS WITH AUX. CONTACTS.

EQUIPMENT COORDINATION SCHEDULE table with columns: TAG NUMBER, EQUIPMENT DESCRIPTION, DRAWING REFERENCE, POWER DATA (LOAD, VOLTS/PH/Hz, FLA), MOTOR CONTROLLER (TYPE, LOCATION, FURNISH BY, INSTALL BY, WIRE BY), DISCONNECT (FURNISH BY, INSTALL BY, WIRE BY), and SEE NOTES.

NOTES: 1. PROVIDE SINGLE POINT POWER CONNECTION. 2. DISCONNECTING MEANS SHALL BE INTEGRAL TO THE VFD AND AND SHALL BE MOUNTED WITHIN SITE OF THE MOTOR. 3. VFD SHALL BE SIZED BASED ON ACTUAL MOTOR NAMEPLATE FLA DATA. VERIFY ACTUAL MOTOR FLA DATA. 4. EXISTING 500 HP (562 FLA) PUMPS TO BE REPLACED IN THE FUTURE. SIZE VFD BASED ON FUTURE 600 HP (672 FLA) PUMP.

ABBREVIATIONS: VFD VARIABLE FREQUENCY DRIVE, SFP SEE FLOOR PLAN, DIV 16 ELECTRICAL CONTRACTOR, ECP EQUIPMENT CONTROL PANEL, MFR MANUFACTURER, DIV 15 HVAC CONTRACTOR

Jan 04, 2013 11:55am lyfeg M:\CAD\DATA\SHARE\CVLS_032 Rec'd Drawg\CVLS_081_20110101.dwg

SYMBIONT logo and address: 6737 West Washington Street, Suite 3440, West Allis, Wisconsin 53214. Lists services: WASTEWATER TREATMENT/CONVEYANCE, FACILITIES ENGINEERING, ENVIRONMENTAL MANAGEMENT, AIR QUALITY, DESIGN/BUILD CONSTRUCTION MANAGEMENT, INVESTIGATION, REMEDIATION & SITE CLOSURE, PROCESS ENGINEERING. Includes project details: CHERRY VALLEY PUMP STATION UPGRADE PHASE 1 IMPROVEMENTS (CAPITAL PROJECT NO. 1032) ROCK RIVER WATER RECLAMATION DISTRICT ROCKFORD, ILLINOIS 61109. SHEET NO. 67, DWG NO. E-8, DATE JAN 2011, PROJ. NO. W101771.

**X – General Provisions and Technical Specifications for
Sanitary Sewer Construction**

(Separate document incorporated by reference)

**VFD Procurement for Cherry Valley Lift Station Pump Replacement
Capital Project No. 1911**

Not intended for bidding purposes!