

**CITY OF ANN ARBOR  
INVITATION TO BID**



**Furnishing of Variable Frequency Drives for  
WTP East High Service**

**ITB No. 4411**

**Due Date: THURSDAY, FEBRUARY 25, 2016 at 2:00p.m.**

Public Services Area  
Administering Service Unit

Issued By:

City of Ann Arbor  
Procurement Unit  
301 E. Huron Street  
Ann Arbor, MI 48104

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## INSTRUCTIONS TO BIDDERS

### General

Work to be done under this Contract is generally described through the detailed specifications and must be completed fully in accordance with the contract documents. All work to be done under this Contract is located in or near the City of Ann Arbor.

Any Bid which does not conform fully to these instructions may be rejected.

### Preparation of Bids

Bids should be prepared providing a straight-forward, concise description of the Bidder's ability to meet the requirements of the ITB. Bids shall be written in ink or typewritten. No erasures are permitted. Mistakes may be crossed out and corrected and must be initialed and dated in ink by the person signing the Bid.

Bids must be submitted on the "Bid Forms" provided with each blank properly filled in. If forms are not fully completed it may disqualify the bid. No alternative bid will be considered unless alternative bids are specifically requested. If alternatives are requested, any deviation from the specification must be fully described, in detail on an "Alternate" section of Bid form.

Each person signing the Bid certifies that he/she is the person in the Bidder's firm/organization responsible for the decision as to the fees being offered in the Bid and has not and will not participated in any action contrary to the terms of this provision.

### Questions or Clarification on ITB Specifications

All questions regarding this ITB shall be submitted via email. Emailed questions and inquires will be accepted from any and all prospective Bidders in accordance with the terms and conditions of the ITB.

All questions shall be due on or before **Thursday, February 18, 2016 at 5p.m.** and should be addressed as follows:

Specification/Scope of Work questions emailed to Glen Wiczorek, [gwiczorek@a2gov.org](mailto:gwiczorek@a2gov.org)  
Bid Process and Compliance questions emailed to [cspencer@a2gov.org](mailto:cspencer@a2gov.org)

Any error, omissions or discrepancies in the specification discovered by a prospective contractor and/or service provider shall be brought to the attention of **Colin Spencer, [cspencer@a2gov.org](mailto:cspencer@a2gov.org)** after discovery as possible. Further, the contractor and/or service provide shall not be allowed to take advantage of errors, omissions or discrepancies in the specifications.

### Addenda

If it becomes necessary to revise any part of the ITB, notice of the Addendum will be posted to Michigan Inter-governmental Trade Network (MITN) [www.mitn.info](http://www.mitn.info) and/or City of Ann Arbor web site [www.A2gov.org](http://www.A2gov.org) for all parties to download.

Each Bidder must in its Bid, to avoid any miscommunications, acknowledge all addenda which it has received, but the failure of a Bidder to receive, or acknowledge receipt of; any addenda shall not relieve the Bidder of the responsibility for complying with the terms thereof.

The City will not be bound by oral responses to inquiries or written responses other than written addenda.

## Bid Submission

All Bids are due and must be delivered to the City of Ann Arbor Procurement Unit on or before **Thursday, February 25, 2016 at 2:00p.m.** Bids submitted late or via oral, telephonic, telegraphic, electronic mail or facsimile **will not** be considered or accepted.

Each Bidder must submit one (1) original Bid and two (2) Bid copies in a sealed envelope clearly marked: **ITB No. 4411 – Furnishing of Variable Frequency Drives for WTP East High Service.**

### **Bids must be addressed and delivered to:**

City of Ann Arbor  
Procurement Unit,  
C/O Customer Services, 1<sup>st</sup> Floor  
301 East Huron Street  
P.O. Box 8647  
Ann Arbor, MI 48107

All Bids received on or before the Due Date will be publicly opened and recorded immediately. No immediate decisions are rendered.

**The following forms provided within this ITB Document must be included in submitted bids.**

- **City of Ann Arbor Non-Discrimination Ordinance Declaration of Compliance**
- **Vendor Conflict of Interest Disclosure Form**

**Bids that fail to provide these completed forms listed above upon bid opening will be rejected as non-responsive and will not be considered for award.**

Hand delivered bids will be date/time stamped/signed by the Procurement Unit at the address above in order to be considered. Normal business hours are 9:00 a.m. to 3:00 p.m. Monday through Friday, excluding Holidays. The City will not be liable to any Bidder for any unforeseen circumstances, delivery or postal delays. Postmarking to the Due Date will not substitute for receipt of the Bid. Each Bidder is responsible for submission of their Bid.

Additional time for submission of bids past the stated due date and time will not be granted to a single Bidder; however, additional time may be granted to all Bidders when the City determines in its sole discretion that circumstances warrant it.

## Bid Security

Each bid must be accompanied by a certified check, or Bid Bond by a surety licensed and authorized to do business within the State of Michigan, in the amount of 5% of the total of the bid price.

## Award

The City intends to award a Contract(s) to the lowest responsible Bidder(s). On multi-divisional contracts, separate divisions may be awarded to separate Bidders. The City may also utilize alternatives offered in the Bid Forms, if any, to determine the lowest responsible Bidder on each division, and award multiple divisions to a single Bidder, so that the lowest total cost is achieved for the City. For unit price bids, the Contract will be awarded based upon the unit prices and the lump sum prices stated by the bidder for the work items specified in the bid documents, with consideration given to any alternates selected by the City. If the City determines that the unit price for any item is materially different for the work item bid than either other bidders or the general market, the City, in its sole discretion, in addition to any other right it may have, may reject the bid as not responsible or non-conforming.

The acceptability of major subcontractors will be considered in determining if a Bidder is responsible. In comparing Bids, the City will give consideration to alternate Bids for items listed in the bid forms. All key staff and subcontractors are subject to the approval by the City.

## Official Documents

The City of Ann Arbor officially distributes bid documents from the Procurement Unit or through the Michigan Intergovernmental Trade Network (MITN). Copies of the bid documents obtained from any other source are not Official copies. Addenda and other bid information will only be posted to these official distribution sites. If you obtained City of Ann Arbor Bid documents from other sources, it is recommended that you register on [www.MITN.info](http://www.MITN.info) and obtain an official Bid.

## Taxes

Municipalities are exempt from Michigan State Sales and Federal Excise taxes. Do not include such taxes in the proposal figure. The City will furnish the successful bidder with tax exemption certificates when requested.

## Withdrawal of Bids

After the time of opening, no Bid may be withdrawn for the period of one hundred twenty (120) days specified in the Advertisement.

## Human Rights Information

All contractors proposing to do business with the City shall satisfy the contract compliance administrative policy adopted by the City Administrator in accordance with the Section 9:158 of the Ann Arbor City Code. Breach of the obligation not to discriminate shall be a material breach of the contract. Contractors are required to post a copy of Ann Arbor's Non-Discrimination Ordinance attached at all work locations where its employees provide services under a contract with the City.

## Conflict Of Interest Disclosure

The City of Ann Arbor Purchasing Policy requires that prospective Vendors complete a Conflict of Interest Disclosure form. A contract may not be awarded to the selected Vendor unless and until the Procurement Unit and the City Administrator have reviewed the Disclosure form and determined that no conflict exists under applicable federal, state, or local law or administrative regulation. Not every relationship or situation disclosed on the Disclosure Form may be a disqualifying conflict. Depending on applicable law and regulations, some contracts may awarded on the recommendation of the City Administrator after full disclosure, where such action is allowed by law, if demonstrated competitive pricing exists and/or it is determined the award is in the best interest of the City. A copy of the Vendor Conflict of Interest Disclosure Form is attached.

## Debarment

Submission of a Bid in response to this ITB is certification that the Bidder is not currently debarred, suspended, proposed for debarment, and declared ineligible or voluntarily excluded from participation in this transaction by any State or Federal departments or agency. Submission is also agreement that the City will be notified of any changes in this status.

## Disclosures

After bids are opened, all information in a submitter's bid is subjected to disclosure under the provisions of Michigan Public Act No. 442 of 1976, as amended (MCL 15.231 et seq.) known as the "Freedom of Information Act." The Freedom of Information Act also provides for the complete disclosure of contracts and attachments thereto except where specifically exempted.

## Bid Protest

All Bid protests must be in writing and filed with the Purchasing Agent within five (5) business days of the intent to award action. The bidder must clearly state the reasons for the protest. If a bidder contacts a City Service Area/Unit and indicates a desire to protest an award, the Service Area/Unit shall refer the bidder to the Purchasing Agent. The Purchasing Agent will provide the bidder with the appropriate instructions for filing the protest. The protest shall be reviewed by the City Administrator or designee whose decision shall be final.

## Cost Liability

The City of Ann Arbor assumes no responsibility or liability for costs incurred by the Bidder prior to the execution of a contract with the City. By submitting a bid, a bidder agrees to bear all costs incurred or related to the preparation, submission and selection process for the bid.

## Reservation of Rights

The City of Ann Arbor reserves the right to accept any bid or alternative bid proposed in whole or in part, to reject any or all bids or alternatives bids in whole or in part and to waive irregularity and/or informalities in any bid and to make the award in any manner deemed in the best interest of the City.

## INVITATION TO BID

City of Ann Arbor  
Guy C. Larcom Municipal Building  
Ann Arbor, Michigan 48107

Ladies and Gentlemen:

The undersigned, as Bidder, declares that this Bid is made in good faith, without fraud or collusion with any person or persons bidding on the same Contract; that this Bidder has carefully read and examined the bid documents, including City Nondiscrimination requirements, Vendor Conflict of Interest Form, Instructions to Bidders, Bid Forms, Purchase Order (or Agreement) Terms and Conditions, General Conditions, Detailed Specifications, and all Addenda, and understands them. The Bidder declares that it conducted a full investigation of the work proposed and is fully informed as to the nature of the work and the conditions relating to the work's performance.

The Bidder acknowledges that it has not received or relied upon any representations or warrants of any nature whatsoever from the City of Ann Arbor, its agents or employees, and that this Bid is based solely upon the Bidder's own independent business judgment.

The undersigned proposes to perform all work described in the bid documents, including any addenda issued, and to furnish all necessary machinery, tools, apparatus, to do all the work, furnish all the materials, and complete the work in strict accordance with all terms of the Contract of which this Bid is one part.

In accordance with these bid documents, and Addenda numbered \_\_\_\_\_, the undersigned, as Bidder, proposes to perform at the sites in and/or around Ann Arbor, Michigan, all the work included herein for the amounts set forth in the Bid Forms.

Bidder further agrees that the cited provisions of Chapter 14 and Chapter 23 form a part of this Contract. The Bidder declares that it has become familiar with the City Conflict of Interest Disclosure Form and certifies that the statement contained therein is true and correct.

In submitting this Bid, it is understood that the right is reserved by the City to accept any Bid, to reject any or all Bids, to waive irregularities and/or informalities in any Bid, and to make the award in any manner the City believes to be in its best interest.

(This Space Intentionally Left Blank)

SIGNED THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 2016.

\_\_\_\_\_  
Bidder's Name

\_\_\_\_\_  
Authorized Signature of Bidder

\_\_\_\_\_  
Official Address

\_\_\_\_\_  
(Print Name of Signer Above)

\_\_\_\_\_  
Telephone Number

\_\_\_\_\_  
Email Address for Award Notice



## LEGAL STATUS OF BIDDER

(The Bidder shall fill out the appropriate form and strike out the other three.)

Bidder declares that it is:

\* A corporation organized and doing business under the laws of the State of \_\_\_\_\_, for whom \_\_\_\_\_, bearing the office title of \_\_\_\_\_, whose signature is affixed to this Bid, is authorized to execute contracts.

**NOTE: If not incorporated in Michigan, please attach the corporation's Certificate of Authority**

• A limited liability company doing business under the laws of the State of \_\_\_\_\_, whom \_\_\_\_\_ bearing the title of \_\_\_\_\_ whose signature is affixed to this proposal, is authorized to execute contract on behalf of the LLC.

\* A partnership, organized under the laws of the state of \_\_\_\_\_ and filed in the county of \_\_\_\_\_, whose members are (list all members and the street and mailing address of each) (attach separate sheet if necessary):

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\* An individual, whose signature with address, is affixed to this Bid: \_\_\_\_\_ (initial here)

**Authorized Official**

\_\_\_\_\_ **Date** \_\_\_\_\_, 2015

(Print) Name \_\_\_\_\_ Title \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

Contact Phone ( ) \_\_\_\_\_ Fax ( ) \_\_\_\_\_

Email \_\_\_\_\_

# BID FORM

## Section 1 – Schedule of Prices

Project: Furnishing of Variable Frequency Drives for WTP East High Service ITB No.4411

Bidder's Name: \_\_\_\_\_

**Notes:**

1. All bidders shall provide a Unit Price and Total Price for all bid items specified.
2. Quantities included in the bid table represent estimated quantities for different work. The CONTRACTOR shall be compensated for the actual number of items completed using the unit prices provided.
3. The City, at its sole discretion, may elect to delete any portion of the work delineated below, with no change to the unit prices provided. Work shall be determined based upon the availability of funds.
4. Any item not provided in the following list shall be considered incidental.
5. Contract shall be awarded based on the base bid or any combination of base bid and alternate bid in any manner the City believes to be in its best interest.

**Bid Items**

The Bidder agrees to complete the Project and all related work, as specified, for the following unit prices.

<b>FURNISHING OF VARIABLE FREQUENCY DRIVES FOR WTP EAST HIGH SERVICE BID</b>					
<b>Item No.</b>	<b>Item Description</b>	<b>QTY</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Total Price</b>
1.	Fabricate and deliver 350 HP Variable Frequency Drive, accessories and related work	2	EA	\$	\$
<b>TOTAL BASE BID</b>					<b>\$</b>

Total Base Bid: \_\_\_\_\_ Dollars

(\$ \_\_\_\_\_)

(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

As part of their bid, Bidder shall include separate documentation indicating the dimensions (width, depth, and height) of a cabinet with and without bypass contractor.

**Alternates**

***Bidder shall provide cost for providing the following options.***

**Alternate No. 1 – Bypass Contactor**

*Provide one (1) VFD with fully rated bypass contactor. Bypass contact shall incorporate motor protection function (Motor and bearing temperature protection) while in the bypass mode.*

**Add:** \_\_\_\_\_ **Dollars (\$\_\_\_\_\_)**

(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

**Alternate No. 2 – Vibration Monitoring System**

*Provide vibration monitoring detection system as described in specification.*

**Add:** \_\_\_\_\_ **Dollars (\$\_\_\_\_\_)**

(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

**Alternate No. 3 – Extended Warranty**

*Provide five-year warranty from the date of substantial completion.*

**Add:** \_\_\_\_\_ **Dollars (\$\_\_\_\_\_)**

(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

**Alternate No. 4 –Manufacturer’s Remote Training Class**

*Provide transportation (departing and returning), accommodations and a VFD training class at the manufacturer’s facilities for two City employees. The training class shall be a manufacturer’s course in operations, maintenance and troubleshooting of VFDs similar to those provided in this Project.*

**Add:** \_\_\_\_\_ **Dollars (\$\_\_\_\_\_)**

(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

## **GENERAL CONDITIONS**

### **QUANTITIES**

Quantities stated are estimated and not guaranteed.

### **DELIVERY**

Materials are F.O.B. delivered, freight paid, to the City of Ann Arbor Water Treatment Plant at 919 Sunset Road, Ann Arbor, MI 48103.

### **DOWN PAYMENTS**

Any bid proposal submitted which requires a down payment or prepayment of any kind prior to delivery and acceptance of the item, as being in conformance with the specifications will not be considered for award.

### **PURCHASE ORDER**

After the Ann Arbor City Council has approved the award and the contract has been fully executed the successful bidder will be issued a purchase order from the City of Ann Arbor.

### **CONTRACT TERMINATION**

The City of Ann Arbor reserves the right to terminate the contract upon 30 days written notice for any reason deemed to be in its best interest. For performance related issues, the City designated representative will be solely responsible for determining acceptable performance levels. His/her decision will be deemed in the City of Ann Arbor's best interest and will be final.

### **CONTRACT TERM**

The pricing provided under this ITB shall be firm for 120 days from the date approved by City Council.

### **TIME OF COMPLETION**

The work to be completed under this Contract shall begin immediately on the date specified in the Notice to Proceed issued by the City. The entire work for this Contract shall be delivered and complete within 140 consecutive calendar days. Shorter completion times for certain portions of the work may be specified in the Detailed Specifications. Liquidated damages shall also apply to the time of completion and the intermediate milestones as provided in the Sample Purchase Agreement.

# SAMPLE PURCHASE AGREEMENT

*If a contract is awarded, the selected Firm(s) will be required to adhere to a set of general contract provisions which will become a part of any formal agreement. These provisions are general principles which apply to all contractors/service providers to the City of Ann Arbor. The required provisions are:*

**SAMPLE PURCHASE AGREEMENT BETWEEN**  
**\_\_\_\_\_**  
**AND THE CITY OF ANN ARBOR**  
**FOR Furnishing of Variable Frequency Drives for**  
**WTP East High Service**

The City of Ann Arbor, a Michigan municipal corporation, having its offices at 301 E. Huron St. Ann Arbor, Michigan 48103 ("City"), and \_\_\_\_\_

("Contractor") a(n) \_\_\_\_\_  
(State where organized) (Partnership, Sole Proprietorship, or Corporation)  
with its address at \_\_\_\_\_ agree as  
follows on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

The Contractor agrees to provide services to the City under the following terms and conditions:

I. DEFINITIONS

Administering Service Area/Unit means the Public Services Area.

Contract Administrator means the Water Treatment Plant, Senior Utilities Engineer, acting personally or through any assistants authorized by the Administrator/Manager of the Administering Service Area/Unit

Project means Furnishing of Variable Frequency Drives for WTP East High Service.

II. TIME OF COMPLETION

- A. The work to be completed under this Contract shall begin immediately on the date specified in the Notice to Proceed issued by the City.
- B. The entire work for this Contract shall be delivered and complete within 140 consecutive calendar days. Shorter completion times for certain portions of the work may be specified in the Detailed Specifications. Liquidated damages shall also apply to the time of completion and the intermediate milestones.
- C. Failure to complete all the work within the time specified above, including any extension granted in writing by the Supervising Professional, shall obligate the Contractor to pay the City, as liquidated damages and not as a penalty, an amount equal to \$500 for each calendar day of delay in the completion of all the work. If any liquidated damages are unpaid by the Contractor, the City shall be

entitled to deduct these unpaid liquidated damages from the monies due the Contractor.

As an independent requirement, where the Detailed Specifications or Plans identify certain portions of the work to be completed within a shorter period of time and the Contractor fails to complete each portion within the shorter period

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specified for each portion, including any extension granted in writing by the Project Supervisor, the City is entitled to deduct from the monies due the Contractor, as liquidated damages and not as a penalty, the amount equal to that identified in Specifications or Plans for each portion or Phase of the work not timely completed for each calendar day of delay in completion of each portion of the work.

The liquidated damages are for the non-quantifiable aspects of any of the previously identified events and do not cover actual damages that can be shown or quantified nor are they intended to preclude recovery of actual damages in addition to the recovery of liquidated damages.

### III. SCOPE OF WORK

- A. General Scope: The Contractor agrees to furnish all of the materials, equipment and labor necessary; and to abide by all the duties and responsibilities applicable to it for the Project in accordance with the requirements and provisions of the following documents, including all written modifications incorporated into any of the documents, which are incorporated as part of this Contract:

Contract and Exhibits

Bid No. 4411 and Addenda (if applicable)

Bid Proposal of Contractor, dated \_\_\_\_\_

The contract documents are complementary and what is called for by any one shall be binding. The intention of the documents is to include all labor and materials, equipment and transportation necessary for the proper execution of the Project. Materials or work described in words that so applied have a well-known technical or trade meaning have the meaning of those recognized standards.

In case of a conflict among the contract documents listed above in any requirement(s), the requirement(s) of the document listed first shall prevail over any conflicting requirement(s) of a document listed later.

- B. Quality of Services: The Contractor's standard of service under this agreement shall be of the level of quality performed by businesses regularly rendering this type of durable goods. Determination of acceptable quality shall be made solely by the Contract Administrator.
- C. Compliance with Applicable Law: The Contractor shall provide products under this agreement in compliance with all applicable laws, ordinances and regulations.
- D. Location: The Contractor shall provide all of these goods to the City of Ann Arbor

IV. RELATIONSHIP OF PARTIES

- A. The parties to this agreement agree that it is not a contract of employment but is a contract to accomplish a specific result. Contractor is an independent contractor performing services for the City. Nothing contained in this agreement shall be deemed to constitute any other relationship between the City and the Contractor.
- B. The Contractor certifies that it has no personal or financial interest in the project other than the fee it is to receive under this agreement. The Contractor further certifies that it shall not acquire any such interest, direct or indirect, which would conflict in any manner with the performance of services under this agreement. Further Contractor agrees and certifies that it does not and will not employ or engage any person with a personal or financial interest in this agreement.
- C. Contractor does not have any authority to execute any contract or agreement on behalf of the City, and is not granted any authority to assume or create any obligation or liability on the City's behalf, or to bind the City in any way.
- D. Contractor certifies that it is not, and shall not become, overdue or in default to the City for any contract, debt, or any other obligation to the City including real or personal property taxes. City shall have the right to set off any such debt against compensation awarded for services under this agreement.

V. COMPENSATION OF CONTRACTOR

- A. The Contractor shall be paid on the basis of the bid price. The total fee to be paid the Contractor for the goods and/or services shall not exceed (\$\_\_\_\_\_). Payment shall be made within 30 days of acceptance of the work by the Contract Administrator. It is understood and agreed between the parties that the compensation stated above is inclusive of any and all remuneration to which the Contractor may be entitled.

VI. INSURANCE; INDEMNIFICATION

- A. The Contractor shall procure and maintain during the life of this Contract, including the guarantee period and during any warranty work, such insurance policies, including those set forth below, as will protect itself from all claims for bodily injuries, death or property damage which may arise under this Contract; whether the acts were made by the Contractor or by any subcontractor or anyone employed by them directly or indirectly. The following insurance policies are required:
  - 1. Worker's Compensation Insurance in accordance with all applicable state and federal statutes. Further, Employers Liability Coverage shall be obtained in the following minimum amounts:

Bodily Injury by Accident - \$500,000 each accident

Bodily Injury by Disease - \$500,000 each employee  
Bodily Injury by Disease - \$500,000 each policy limit

2. Commercial General Liability Insurance equivalent to, as a minimum, Insurance Services Office form CG 00 01 07 98. The City of Ann Arbor shall be an additional insured. There shall be no added exclusions or limiting endorsements including, but not limited to: Products and Completed Operations, Explosion, Collapse and Underground coverage or Pollution. Further, the following minimum limits of liability are required:

\$1,000,000 Each occurrence as respect Bodily Injury Liability or Property Damage Liability, or both combined.

\$2,000,000 Per Job General Aggregate

\$1,000,000 Personal and Advertising Injury

\$2,000,000 Products and Completed Operations Aggregate

3. Motor Vehicle Liability Insurance, including Michigan No-Fault Coverages, equivalent to, as a minimum, Insurance Services Office form CA 00 01 07 97. The City of Ann Arbor shall be an additional insured. There shall be no added exclusions or limiting endorsements. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles. Further, the limits of liability shall be \$1,000,000 for each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.

4. Umbrella/Excess Liability Insurance shall be provided to apply excess of the Commercial General Liability, Employers Liability and the Motor Vehicle coverage enumerated above, for each occurrence and for aggregate in the amount of \$1,000,000.

B. Insurance required under VI.A.2 and A.3 of this Contract shall be considered primary as respects any other valid or collectible insurance that the City may possess, including any self-insured retentions the City may have; and any other insurance the City does possess shall be considered excess insurance only and shall not be required to contribute with this insurance. Further, the Contractor agrees to waive any right of recovery by its insurer against the City.

C. In the case of all Contracts involving on-site work, the Contractor shall provide to the City before the commencement of any work under this Contract documentation demonstrating it has obtained the above mentioned policies. Documentation must provide and demonstrate an unconditional 30 day written notice of cancellation in favor of the City of Ann Arbor. Further, the documentation must explicitly state the following: (a) the policy number; name of insurance company; name and address of the agent or authorized representative; name and address of insured; project name; policy expiration date; and specific coverage amounts; (b) any deductibles or self-insured retentions which shall be approved by the City, in its sole discretion; (c) that the



policy conforms to the requirements specified. An original certificate of insurance may be provided as an initial indication of the required insurance, provided that no later than 21 calendar days after commencement of any work the Contractor supplies a copy of the endorsements required on the policies. Upon request, the Contractor shall provide within 30 days a copy of the policy(ies) to the City. If any of the above coverages expire by their terms during the term of this Contract, the Contractor shall deliver proof of renewal and/or new policies to the Administering Service Area/Unit at least ten days prior to the expiration date.

- D. Any insurance provider of Contractor shall be admitted and authorized to do business in the State of Michigan and shall carry and maintain a minimum rating assigned by A.M. Best & Company's Key Rating Guide of "A-" Overall and a minimum Financial Size Category of "V". Insurance policies and certificates issued by non-admitted insurance companies are not acceptable unless approved in writing by the City.
- E. To the fullest extent permitted by law, for any loss not covered by insurance under this contract, Contractor shall indemnify, defend and hold harmless the City, its officers, employees and agents harmless from all suits, claims, judgments and expenses including attorney's fees resulting or alleged to result, in whole or in part, from any act or omission, which is in any way connected or associated with this contract, by the Contractor or anyone acting on the Contractor's behalf under this contract. Contractor shall not be responsible to indemnify the City for losses or damages caused by or resulting from the City's sole negligence.
- F. A template for the insurance and endorsement requirements is provided in the Appendices of this ITB.

## XII. COMPLIANCE REQUIREMENTS

- A. Nondiscrimination. The Consultant agrees to comply with the nondiscrimination provisions of Chapter 112 of the Ann Arbor City Code and to take affirmative action to assure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity and tends to eliminate any inequality based upon race, national origin or sex. The Consultant agrees to comply with the provisions of Section 9:161 of Chapter 112 of the Ann Arbor City Code, Exhibit A

## VIII. WARRANTIES BY CONTRACTOR

- A. The Contractor's standard of service under this agreement shall be of the level of quality performed by businesses regularly rendering this type of durable goods. The Contractor warrants that the repairs shall be free of defects for a period of one year.
- B. The Contractor warrants that it has all the skills and experience necessary to provide the durable goods it is to provide pursuant to this agreement. The Contractor may rely upon the accuracy of reports and surveys provided to it by the City except when defects should have been apparent to a reasonably

competent contractor or when it has actual notice of any defects in the reports and surveys.

#### IX. TERMINATION OF AGREEMENT; RIGHTS ON TERMINATION

- A. This agreement may be terminated by either party in the case of a breach of this agreement by the other party, if the breaching party has not corrected the breach within 15 days after notice of termination is given in conformance with the terms of this agreement.
- B. If contracting services are terminated for reasons other than the breach of the agreement by the Contractor, the Contractor shall be compensated for reasonable time spent and reasonable quantities of materials used prior to notification of termination.

#### X. OBLIGATIONS OF THE CITY

- A. The City agrees to give the Contractor access to staff and City owned properties as required to provide the necessary goods under the agreement.
- B. The City shall notify the Contractor of any defects in the goods of which the City has actual notice.

#### XI. ASSIGNMENT

- A. The Contractor shall not subcontract or assign any portion of this Agreement without prior written consent to such action by the City.
- B. The Contractor shall retain the right to pledge payment(s) due and payable under the agreement to third parties.

#### XII. NOTICE

All notices and submissions required under the agreement shall be by personal delivery or by first-class mail, postage prepaid, to the address stated in this agreement or such other address as either party may designate by prior written notice to the other. Notice shall be considered delivered under this agreement when personally delivered to the Contract Administrator or placed in the U.S. mail, postage prepaid to the Administering Service Area/Unit, care of the Contract Administrator.

#### XIII. EXTENT OF AGREEMENT

This agreement represents the entire understanding between the City and the Contractor and it supersedes all prior representations or agreements whether written or oral. Neither party has relied on any prior representations in entering into this agreement.

This agreement may be altered, amended or modified only by written amendment signed

by the Contractor and the City.

XIV. SEVERABILITY OF PROVISIONS

Whenever possible, each provision of this agreement will be interpreted in a manner as to be effective and valid under applicable law. However, if any provision of this agreement or the application of any provision to any party or circumstance will be prohibited by or invalid under applicable law, that provision will be ineffective to the extent of the prohibition or invalidity without invalidating the remainder of the provisions of this agreement or the application of the provision to other parties or other circumstances.

XV. CHOICE OF LAW

This agreement shall be construed, governed, and enforced in accordance with the laws of the State of Michigan. By executing this agreement, the Contractor and the City agree to venue in a court of appropriate jurisdiction sitting within Washtenaw County for purposes of any action arising under this agreement.

**FOR CONTRACTOR**

By \_\_\_\_\_

Its

**THE CITY OF ANN ARBOR**

By \_\_\_\_\_

Christopher Taylor, Mayor

By \_\_\_\_\_

Jacqueline Beaudry, City Clerk

***Approved as to substance***

By \_\_\_\_\_

Tom Crawford, Interim City Administrator

By \_\_\_\_\_

Craig Hupy, Public Service Area Administrator

***Approved as to form and content***

By \_\_\_\_\_

Stephen K. Postema, City Attorney

## EXHIBIT A

### FAIR EMPLOYMENT PRACTICE

The contractor, its agents or sub-contractors, shall comply with all requirements of Chapter 112 of Title IX of the Code of the City of Ann Arbor and in particular the following excerpts therefrom:

#### 9:161 NONDISCRIMINATION BY CITY CONTRACTORS

- (1) All contractors proposing to do business with the City of Ann Arbor shall satisfy the nondiscrimination administrative policy adopted by the City Administrator in accordance with the guidelines of this section. All contractors shall receive approval from the Director prior to entering into a contract with the City, unless specifically exempted by administrative policy. All City contractors shall take affirmative action to insure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity and tends to eliminate inequality based upon race, national origin or sex.
- (2) Each prospective contractor shall submit to the City data showing current total employment by occupational category, sex and minority group. If, after verifying this data, the Director concludes that it indicates total minority and female employment commensurate with their availability within the contractor's labor recruitment area, i.e., the area from which the contractor can reasonably be expected to recruit, said contractor shall be accepted by the Director as having fulfilled affirmative action requirements for a period of one year at which time the Director shall conduct another review. Other contractors shall develop an affirmative action program in conjunction with the Director. Said program shall include specific goals and timetables for the hiring and promotion of minorities and females. Said goals shall reflect the availability of minorities and females within the contractor's labor recruitment area. In the case of construction contractors, the Director shall use for employment verification the labor recruitment area of the Ann Arbor-Ypsilanti standard metropolitan statistical area. Construction contractors determined to be in compliance shall be accepted by the Director as having fulfilled affirmative action requirements for a period of six (6) months at which time the Director shall conduct another review.
- (3) In hiring for construction projects, contractors shall make good faith efforts to employ local persons, so as to enhance the local economy.
- (4) All contracts shall include provisions through which the contractor agrees, in addition to any other applicable Federal or State labor laws:
  - (a) To set goals, in conference with the Human Resources Director, for each job category or division of the work force used in the completion of the City work;
  - (b) To provide periodic reports concerning the progress the contractor has made in meeting the affirmative action goals it has agreed to;
  - (c) To permit the Director access to all books, records and accounts

pertaining to its employment practices for the purpose of determining compliance with the affirmative action requirements.

- (5) The Director shall monitor the compliance of each contractor with the nondiscrimination provisions of each contract. The Director shall develop procedures and regulations consistent with the administrative policy adopted by the City Administrator for notice and enforcement of non-compliance. Such procedures and regulations shall include a provision for the posting of contractors not in compliance.
- (6) All City contracts shall provide further that breach of the obligation not to discriminate shall be a material breach of the contract for which the City shall be entitled, at its option, to do any or all of the following:
  - (a) To cancel, terminate, or suspend the contract in whole or part and/or refuse to make any required periodic payments under the contract;
  - (b) Declare the contractor ineligible for the award of any future contracts with the City for a specified length of time;
  - (c) To recover liquidated damages of a specified sum, said sum to be that percentage of the labor expenditure for the time period involved which would have accrued to minority group members had the affirmative action not been breached;
  - (d) Impose for each day of non-compliance, liquidated damages of a specified sum, based upon the following schedule:

<u>Contract Amount</u>	<u>Assessed Damages Per Day of Non-Compliance</u>
\$ 10,000 - 24,999	\$ 25.00
25,000 - 99,999	50.00
100,000 - 199,999	100.00
200,000 - 499,999	150.00
500,000 - 1,499,999	200.00
1,500,000 - 2,999,999	250.00
3,000,000 - 4,999,999	300.00
5,000,000 - and above	500.00

- (e) In addition the contractor shall be liable for any costs or expenses incurred by the City of Ann Arbor in obtaining from other sources the work and services to be rendered or performed or the goods or properties to be furnished or delivered to the City under this contract.



## CITY OF ANN ARBOR NON-DISCRIMINATION ORDINANCE

Relevant provisions of Chapter 112, Nondiscrimination, of the Ann Arbor City Code are included below. You can review the entire ordinance at [www. a2gov.org/departments/city-clerk](http://www.a2gov.org/departments/city-clerk)

**Intent:** It is the intent of the city that no individual be denied equal protection of the laws; nor shall any individual be denied the enjoyment of his or her civil or political rights or be discriminated against because of actual or perceived age, arrest record, color, disability, educational association, familial status, family responsibilities, gender expression, gender identity, genetic information, height, HIV status, marital status, national origin, political beliefs, race, religion, sex, sexual orientation, source of income, veteran status, victim of domestic violence or stalking, or weight.

**Discriminatory Employment Practices:** No person shall discriminate in the hire, employment, compensation, work classifications, conditions or terms, promotion or demotion, or termination of employment of any individual. No person shall discriminate in limiting membership, conditions of membership or termination of membership in any labor union or apprenticeship program.

**Discriminatory Effects:** No person shall adopt, enforce or employ any policy or requirement which has the effect of creating unequal opportunities according to actual or perceived age, arrest record, color, disability, educational association, familial status, family responsibilities, gender expression, gender identity, genetic information, height, HIV status, marital status, national origin, political beliefs, race, religion, sex, sexual orientation, source of income, veteran status, victim of domestic violence or stalking, or weight for an individual to obtain housing, employment or public accommodation, except for a bona fide business necessity. Such a necessity does not arise due to a mere inconvenience or because of suspected objection to such a person by neighbors, customers or other persons.

**Nondiscrimination by City Contractors:** All contractors proposing to do business with the City of Ann Arbor shall satisfy the contract compliance administrative policy adopted by the City Administrator in accordance with the guidelines of this section. All city contractors shall ensure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity and tends to eliminate inequality based upon any classification protected by this chapter. All contractors shall agree not to discriminate against an employee or applicant for employment with respect to hire, tenure, terms, conditions, or privileges of employment, or a matter directly or indirectly related to employment, because of any applicable protected classification. All contractors shall be required to post a copy of Ann Arbor's Non-Discrimination Ordinance at all work locations where its employees provide services under a contract with the city.

**Complaint Procedure:** If any individual has a grievance alleging a violation of this chapter, he/she has 180 calendar days from the date of the individual's knowledge of the allegedly discriminatory action or 180 calendar days from the date when the individual should have known of the alleged discriminatory action to file a complaint with the city's Human Rights Commission. If an individual fails to file a complaint alleging a violation of this chapter within the specified time frame, the complaint will not be considered by the Human Rights Commission. The complaint should be made in writing to the Human Rights Commission. The complaint may be filed in person with the City Clerk, by e-mail at [aahumanrightscommission@gmail.com](mailto:aahumanrightscommission@gmail.com), or by mail (Ann Arbor Human Rights Commission, PO Box 8647, Ann Arbor, MI 48107). The complaint must contain information about the alleged discrimination, such as name, address, phone number of the complainant and location, date and description of the alleged violation of this chapter.

**Private Actions For Damages or Injunctive Relief:** To the extent allowed by law, an individual who is the victim of discriminatory action in violation of this chapter may bring a civil action for appropriate injunctive relief or damages or both against the person(s) who acted in violation of this chapter.

THIS IS AN OFFICIAL GOVERNMENT NOTICE AND  
MUST BE DISPLAYED WHERE EMPLOYEES CAN READILY SEE IT.





**Vendor Conflict of Interest Disclosure Form**

All vendors interested in conducting business with the City of Ann Arbor must complete and return the Vendor Conflict of Interest Disclosure Form in order to be eligible to be awarded a contract. Please note that all vendors are subject to comply with the City of Ann Arbor's conflict interest policies as stated within the certification section below.

If a vendor has a relationship with a City of Ann Arbor official or employee, an immediate family member of a City of Ann Arbor official or employee, the vendor shall disclose the information required below.

**Certification:** I hereby certify that to my knowledge, there is no conflict of interest involving the vendor named below:

1. No City official or employee or City employee's immediate family member has an ownership interest in vendor's company or is deriving personal financial gain from this contract.
2. No retired or separated City official or employee who has been retired or separated from the City for less than one (1) year has an ownership interest in vendor's Company.
3. No City employee is contemporaneously employed or prospectively to be employed with the vendor.
4. Vendor hereby declares it has not and will not provide gifts or hospitality of any dollar value or any other gratuities to any City employee or elected official to obtain or maintain a contract.
5. Please note any exceptions below:

Vendor Name	Vendor Phone Number
Conflict of Interest Disclosure *	
Name of City of Ann Arbor employees, elected officials, or immediate family members with whom there maybe a potential conflict of interest.	<input type="checkbox"/> Relationship to employee _____ <input type="checkbox"/> Interest in vendor's company _____ <input type="checkbox"/> Other _____

\*Disclosing a potential conflict of interest does not disqualify vendors. In the event vendors do not disclose potential conflicts of interest and they are detected by the City, vendor will be exempt from doing business with the City.

I certify that the information provided is true and correct by my signature below:

\_\_\_\_\_  
 Signature of Vendor Authorized Representative                      Date                      Printed Name of Vendor Authorized Representative

**PROCUREMENT USE ONLY**

- Yes, named employee was involved in Bid / Proposal process.
- No, named employee was not involved in procurement process or decision.

**SECTION 01010**  
**SUMMARY OF WORK**

**PART 1 – GENERAL**

**1.1 SUMMARY OF WORK**

- A. Work under this contract consists of furnishing variable frequency drives (VFD), associated equipment and related work as specified. Related work shall include, but is not limited to, manufacturer's inspection of installation, training, furnishing O & M manuals, start-up and commissioning efforts.
- B. The new VFDs are replacing two existing 350 hp VFDs by Robicon. The new VFDs will be for speed control of existing motors originally installed at the Water Treatment Plant in 1993.
- C. The VFDs shall be installed by the OWNER.
- D. The foregoing description(s) shall not be construed as a complete description of all work required.

**1.2 CONTRACT DOCUMENTS**

- A. Certain Document Sections refer to Divisions of the Contract Specifications. Sections are each individually numbered portions of the Specifications (numerically) such as 08110, 13182, 15206, etc. The term Division is used as a convenience term meaning all Sections within a numerical grouping. Division 16 would thus include Sections 16000 through 16955.
- B. Where references in the contract documents are made to "CONTRACTOR", "SUPPLIER" OR "MANUFACTURER", it shall be interpreted that these references are interchangeable and shall not absolve the Contract Holder from any responsibilities.
- C. Where references in the Contract Documents are made to Contractors for specific disciplines of work (e.g. Supplier, Manufacturer's Representative, etc.), these references shall be interpreted to be the single prime Contractor when the project is bid or awarded as a single prime contract.
- D. The prime Contractor shall be responsible for all work in the Contract Documents regardless of the division of disciplines.

**PART 2 – PRODUCTS**

(NOT USED)

**PART 3 – EXECUTION**

(NOT USED)

END OF SECTION

## SECTION 01330

### SUBMITTAL PROCEDURES

#### **PART 1 - GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Submittal Procedures
- B. Certifications
- C. Shop Drawings
- D. Manufacturers' Instructions
- E. Manufacturers' Field Reports

##### **1.2 SUBMITTAL PROCEDURES**

- A. Package each submittal appropriately for shipping and handling. This shall include an index either on the transmittal or within the submittal itself. Transmit each submittal from SUPPLIER to ENGINEER using a transmittal form. Submittals received from sources other than SUPPLIER will be returned without action. Use separate transmittals for items from different specification sections. Number each submittal consecutively. Resubmittals should have the same number as the original, plus a letter designation for each Resubmittal (i.e. 7-A, 7-B, etc.)
- B. Indicate on the transmittal relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include SUPPLIER's certification that information complies with Contract Document requirements. On Resubmittal, all changes shall be clearly identified for ease of review. Resubmittals shall be reviewed for the clearly identified changes only. Any changes not clearly identified will not be reviewed and original submittal shall govern.
- C. Include the following information on the label for processing and recording action taken.
  - 1. Project name.
  - 2. Date.
  - 3. Name and address of ENGINEER.
  - 4. Name and address of SUPPLIER.
  - 5. Name of manufacturer.
  - 6. Number and title of appropriate specification sections.
  - 7. Drawing number and detail references, as appropriate.
- D. Schedule submittals to expedite the Project, and deliver to ENGINEER at business address. Coordinate submission of related items. Coordinate related activities that require sequential activity.

- E. Review and approve shop drawings, project data, and samples before submitting them.
- F. Submit 4 copies of the shop drawings.
- G. Coordinate each submittal with the requirements of the Contract Documents.
- H. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.
- I. No claim will be allowed for damages or extension of time because of delays in the work resulting from rejection of material or from revision and resubmittal of shop drawings, project data, or samples.
- J. No extension of contract time will be authorized because of failure to transmit submittals to ENGINEER sufficiently in advance of the work to permit processing.
- K. ENGINEER reserves the right to withhold action on a submittal required coordination with other submittals until related submittals are received.
- L. SUPPLIER is responsible for errors, omissions, and deviations from requirements of Contract Documents in submittals and is not relieved by the ENGINEER's review.
- M. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with requirements.
- N. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.
- O. Submittals not requested in conformance with this Specification will not be recognized or processed.
- P. Revise and resubmit as required, identify all changes made since the previous submittal.

### **1.3 CERTIFICATIONS**

- A. When specified in individual specification sections, submit certification by the manufacturer.
- B. Indicate that the material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certifications may be recent or previous test results of the material or product, but must be acceptable to ENGINEER.

### **1.4 SHOP DRAWINGS**

- A. Shop Drawings: Submit to ENGINEER for review for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.
- B. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of shop drawings. Standard information prepared without specific reference to the project is not considered shop drawings.

- C. Shop drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates, and similar drawings. Include the following information:
  - 1. Dimension.
  - 2. Identification of products and materials included.
  - 3. Compliance with specified standards.
  - 4. Notation of coordination requirements.
- D. Shop drawings shall indicate shop painting requirements to include type of paint and manufacturer.
- E. Standard manufactured items in the form of catalog work sheets showing illustrated cuts of the items to be furnished, scale details, sizes, dimensions, quantity, and all other pertinent information should be submitted and approved in a similar manner.
- F. Measurements given on shop drawings or standard catalog sheets, as established from contract drawings and as approved by ENGINEER, shall be followed. When it is necessary to verify field measurements, they shall be checked and established by OWNER.
- G. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

#### **1.5 MANUFACTURER'S INSTRUCTIONS**

- A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to ENGINEER for delivery to OWNER.
- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

#### **1.6 MANUFACTURER'S FIELD REPORTS**

- A. Submit reports for the OWNER.
- B. Submit report in duplicate, within 7 days of observation, to ENGINEER and OWNER for Information.
- C. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the Contract Documents.

### **PART 2 - PRODUCTS**

NOT USED

### **PART 3 - EXECUTION**

#### **3.1 ENGINEER'S ACTION**

- A. Except for submittals for record, information or similar purposes, where action and return

FURNISHING OF VFDS FOR WTP E.H.S.

is required or requested, ENGINEER will review each submittal, mark to indicate action taken, and return promptly.

1. Compliance with specified characteristics is SUPPLIER's responsibility.
- B. Action Stamp: ENGINEER will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:
1. Final Unrestricted Release: Where submittals are marked "No Exceptions Taken" that part of the work covered by the submittal may proceed provided it complies with the requirements of the Contract Documents; final acceptance will depend upon the compliance.
  2. Final-But-Restricted Release: When submittals are marked "Make Corrections Noted" that part of the work covered by the submittal may proceed, provided it complies with notation or correction on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
  3. Returned for Resubmittal: When submittal is marked "Rejected" or "Revise and Resubmit" do not proceed with the part of the work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
    - a. Do not permit submittals marked "Rejected" or "Revise and Resubmit" to be used at site, or elsewhere where work is in progress.
  4. Additional Information Needed: When submittal is marked "Submit Specified Item" SUPPLIER shall submit requested information.
  5. Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "Acknowledge Receipt".
  6. The approval of OWNER and/or ENGINEER shall not relieve SUPPLIER of responsibility for errors on drawings or submittals as OWNER/ENGINEER's checking is intended to cover compliance with drawings and specifications and not enter into every detail of the shop work.

END OF SECTION

## SECTION 01770

### PAYMENT AND CLOSEOUT PROCEDURES

#### **PART 1 - GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Payment Restrictions
- B. Substantial Completion
- C. Request for Final Payment

##### **1.2 PAYMENT RESTRICTIONS**

- A. Electrical equipment included in Division 16 shall be paid for in the following payment sequence:
  - 1. 50% of the contract amount - Upon equipment delivery
  - 2. 50% of the contract amount - Upon successful start-up, testing, commissioning and training OR ninety (90) days after delivery; whichever comes first.
- B. Retainage shall apply to the payment sequence.

##### **1.3 SUBSTANTIAL COMPLETION**

- A. Substantial completion shall be the date as certified by the OWNER when the construction of the Project is sufficiently completed, in accordance with the Contract Documents, so that the Project can be fully utilized for the purposes for which it was intended.
- B. Substantial completion of the project will not be granted until successful completion of the start-up, testing, validation and training have been performed by the Manufacturer.
- C. Multiple Certificates of Substantial completion will not be granted for different portions of the Work. The Project will not be considered substantially complete until both VFDs have been installed; started, tested and validated.
- D. Substantial completion shall also include the following:
  - 1. Delivery of spare parts.
  - 2. Complete and approved O & M Manuals.
  - 3. Completed training sessions.
  - 4. Schedule to correct the remaining equipment punch list items.

##### **1.4 REQUEST FOR FINAL PAYMENT**

- A. Submit request for final payment in accordance with the Agreement and General Conditions, as may be modified by the Supplementary Conditions.
- B. Request for final payment shall be submitted after substantial completion.

- C. Request for final payment shall include:
1. Documents required in the General Conditions, as may be modified by the Supplementary Conditions.
  2. Releases or Waivers of Lien Rights:
    - a. When submitting releases or waivers of Lien rights, provide release or waiver by Supplier that provided labor, material, or equipment.
    - b. Provide list of Subcontractors and Suppliers for which release or waiver of Lien is required.
    - c. Each release or waiver of Lien shall be signed by an authorized representative of entity submitting release or waiver to Supplier.
    - d. Release or waiver of Lien may be conditional upon receipt of final payment.
  4. Consent of Surety.
  5. Documentation that all punch list items are complete.
  6. Warranties.
  7. Operation and Maintenance Manuals.
  8. Record Drawings.

**PART 2 - PRODUCTS**

NOT USED

**PART 3 - EXECUTION**

NOT USED

END OF SECTION



**SECTION 01780**

**CLOSEOUT SUBMITTALS**

**PART 1 - GENERAL**

**1.1 SECTION INCLUDES**

- A. Project record documents.
- B. Spare parts and maintenance products.
- C. Preventative maintenance instructions
- E. Warranties and bonds

**1.2 PROJECT RECORD DOCUMENTS**

- A. Record Shop Drawings:
  - 1. Submit record shop drawings.
  - 2. Reflect any field changes resulting from commissioning.
  - 3. Reflect details not on original Contract documents.
- B. Indicate the date of any revisions to the shop drawings.
- C. Submit documents to OWNER with claim for final Application for Payment.

**1.3 SPARE PARTS AND MAINTENANCE PRODUCTS**

- A. Provide spare parts, maintenance, and extra products in quantities specified in individual specification sections. All wearable items should be supplied to provide at least two years of operation and maintenance.
- B. Deliver to project site and obtain signed receipt from the City prior to final payment.
- C. Crate in containers designed for prolonged storage suitable for handling with hoisting equipment containers: wooded, cardboard, or palletized.
- D. Stencil on containers:
  - 1. Manufacturer/supplier name.
  - 2. Unit name.
  - 3. Spare part name.
  - 4. Manufacturer catalogue number.
  - 5. Other identifying information.
  - 6. Precautionary information.

**1.4 PREVENTATIVE MAINTENANCE SCHEDULE**

- A. Submit, in addition to the operation and maintenance data, an equipment maintenance schedule for each piece of equipment. Include the following:
  - 1. Identity of Equipment.
  - 2. Routine manufacturer recommended preventative maintenance
    - a. Daily
    - b. Weekly
    - c. Monthly
    - d. Quarterly
    - e. Semi-Annually
    - f. Annually
- B. Equipment maintenance schedule in standard manufacturer format for all equipment.

**1.5 WARRANTIES AND BONDS**

- A. Obtain warranties and bonds executed in duplicate by responsible suppliers, and manufacturers. All warranties shall begin at the Date of Substantial Completion, or at the date of acceptance by the OWNER, whichever is later.
- B. Execute and assemble all transferable warranty documents and bonds from suppliers, and manufacturers into one binder.
- C. Verify that documents are in proper form, contain full information, and are notarized. Manufacturer's warranties shall be in the name of the Owner.
- D. Submit prior to Final Application for Payment.
- E. Time of submittals:
  - 1. Make warranty submittal within ten days after Date of Substantial Completion, prior to final Application for Payment.
  - 2. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty or bond period.
- F. Rejection of Warranties: OWNER reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

**PART 2 - PRODUCTS**

NOT USED

**PART 3 - EXECUTION**

NOT USED

END OF SECTION

## SECTION 01781

### OPERATION AND MAINTENANCE DATA

#### **PART 1 - GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Operation and maintenance data/manuals.

##### **1.2 SUBMITTALS**

- A. Submit operations and maintenance data for all equipment.
- B. Quantity Required and Timing of Submittals:
  - 1. Preliminary Submittal:
    - a. Printed Copies: 5 copies.
    - b. Electronic Copies: 1 copy.
    - c. Submit to OWNER by the earlier of: ninety days following approval of Shop Drawings and product data submittals, or thirty days prior to starting training of operations and maintenance personnel, or ten days prior to field quality control testing at the Site.
    - d. Furnish preliminary operation and maintenance data submittal in acceptable form and content, as determined by OWNER/ENGINEER, before associated materials and equipment will be eligible for payment.
  - 2. Final Submittal: Provide final submittal prior to Substantial Completion, unless submittal is specified as required prior to an interim Milestone.
    - a. Printed Copies: 5 copies.
    - b. Electronic Copies (Searchable PDF): 1 copy

##### **1.3 OPERATION AND MAINTENANCE DATA/MANUALS**

- A. Binding and Cover:
  - 1. Bind each operation and maintenance manual in durable, permanent, stiff-cover binder(s), comprising one or more volumes per copy as required. Binders shall be minimum one-inch wide and maximum of three-inch wide. Binders for each copy of each volume shall be identical.
  - 2. Binders shall be locking three-ring/"D"-ring type, or three-post type. Three-ring binders shall be riveted to back cover and include plastic sheet lifter (page guard) at front of each volume.
  - 3. Do not overfill binders.
  - 4. Covers shall be oil-, moisture-, and wear-resistant, including identifying information on cover and spine of each volume.

5. Provide the following information on cover of each volume:
  - a. Title: "OPERATING AND MAINTENANCE INSTRUCTIONS".
  - b. Name or type of material or equipment covered in the manual.
  - c. Volume number, if more than one volume is required, listed as "Volume \_\_\_ of \_\_\_", with appropriate volume-designating numbers filled in.
  - d. Name of Project and, if applicable, Contract name and number.
  - e. Name of building or structure, as applicable.
6. Provide the following information on spine of each volume:
  - a. Title: "OPERATING AND MAINTENANCE INSTRUCTIONS".
  - b. Name or type of material or equipment covered in the manual.
  - c. Volume number, if more than one volume is required, listed as "Volume \_\_\_ of \_\_\_", with appropriate volume-designating numbers filled in.
  - d. Project name and building or structure name.
7. The manuals' cover sheets and spines shall all be matching.

C. Drawings:

1. Bind into the manual drawings, diagrams, and illustrations up to and including 11 inches by 17 inches in size, with reinforcing specified for pages.
2. Documents larger than 11 inches by 17 inches shall be folded and inserted into clear plastic pockets bound into the manual. Mark pockets with printed text indicating content and drawing numbers. Include no more than three drawing sheets per pocket.

D. Copy Quality and Document Clarity:

1. Contents shall be original-quality copies. Documents in the manual shall be either original manufacturer-printed documents or first-generation photocopies indistinguishable from originals. If original is in color, copies shall be in color. Manuals that contain copies that are unclear, not completely legible, off-center, skewed, or where text or drawings are cut by binding holes, are unacceptable. Pages that contain approval or date stamps, comments, or other markings that cover text or drawing are unacceptable. Faxed copies are unacceptable.
2. Clearly mark in ink to indicate all components of materials and equipment on catalog pages for ease of identification. In standard or pre-printed documents, indicate options furnished or cross out inapplicable content. Using highlighters to so indicate options furnished is unacceptable.

E. Organization:

1. Table of Contents:
  - a. Provide table of contents in each volume of each operations and maintenance manual.

- b. In table of contents and at least once in each chapter or section, identify materials and equipment by their functional names. Thereafter, abbreviations and acronyms may be used if their meaning is clearly indicated in a table bound at or near beginning of each volume. Using material or equipment model or catalog designations for identification is unacceptable.
2. Use dividers and labeled index tabs between equipment items and between major categories of information, such as operating instructions, preventive maintenance instructions, and other major subdivisions of data in each manual.
3. Each equipment item shall have an individual cover sheet with the following information:
  - a. Name or type of material or equipment.
  - b. Manufacturer's name, address, telephone number, fax number, and Internet website address.
  - c. Manufacturer's local service representative's name, address, telephone number, fax number, Internet website address, and e-mail addresses, when applicable.
  - d. Manufacturer's shop order and serial number(s) for materials, equipment or assembly furnished.
  - e. City Equipment Number if applicable.

#### **1.4 ELECTRONIC REQUIREMENTS**

- A. Electronic Copies of Operation and Maintenance Manuals:
  1. Each electronic copy shall include all information included in printed copy.
  2. Submit each electronic copy on a separate compact disc (CD), unless another electronic data transfer method or format is acceptable to ENGINEER.
  3. File Format:
    - a. The O&M Manuals will be placed into the OWNER's Content Management System. All electronic files shall be compatible with this system.
    - b. Files shall be in "portable document format (PDF)". Files shall be entirely electronically searchable and created from the original document. Scanned/Image PDF's will not be accepted.
    - b. Submit separate file for each separate document in the printed copy.
    - c. Within each file, provide bookmarks for the following:
      - 1) Each chapter and subsection listed in the printed copy document's table of contents.
      - 2) Each figure.

- 3) Each table.
- 4) Each appendix.
4. Also provide drawings and figures in one of the following formats: “.bmp”, “.tif”, “.jpg”, or “.gif”. Submit files in a separate directory on the CD.
5. Technical drawings will be provided in both AutoDesk DWG format and PDF format.

## 1.5 CONTENT

- A. Submit complete, detailed written operating instructions for each material or equipment item including: function; operating characteristics; limiting conditions; operating instructions for start-up, normal and emergency conditions; regulation and control; operational troubleshooting; and shutdown. Also include, as applicable, written descriptions of alarms generated by equipment and proper responses to such alarm conditions.
- B. Submit written explanations of all safety considerations relating to operation and maintenance procedures.
- C. Submit complete, detailed, written preventive maintenance instructions including all information and instructions to keep materials, equipment, and systems properly lubricated, adjusted, and maintained so that materials, equipment, and systems function economically throughout their expected service life. Instructions shall include:
  1. Written explanations with illustrations for each preventive maintenance task such as inspection, adjustment, lubrication, calibration, and cleaning. Include pre-startup checklists for each equipment item and maintenance requirements for long-term shutdowns.
  2. Recommended schedule for each preventive maintenance task.
  3. Troubleshooting instructions.
  4. List of required maintenance tools and equipment.
- D. Complete bills of material or parts lists for materials and equipment furnished. Lists or bills of material may be furnished on a per-drawing or per-equipment assembly basis. Bills of material shall indicate:
  1. Manufacturer's name, address, telephone number, fax number, and Internet website address.
  2. Manufacturer's local service representative's, address, telephone number, fax number, Internet website address, and e-mail addresses, when applicable.
  3. Manufacturer's shop order and serial number(s) for materials, equipment or assembly furnished.
  4. For each part or piece include the following information:
    - a. Parts cross-reference number. Cross-reference number shall be used to identify the part on assembly drawings, Shop Drawings, or other type of graphic illustration where the part is clearly shown or indicated.

- b. Part name or description.
  - c. Manufacturer's part number.
  - d. Quantity of each part used in each assembly.
  - e. Current unit price of the part at the time the operations and maintenance manual is submitted. Price list shall be dated.
- E. Compete instructions for ordering replaceable parts, including reference numbers (such as shop order number or serial number) that will expedite the ordering process.
- F. Manufacturer's recommended inventory levels for spare parts, extra stock materials, and consumable supplies for the initial two years of operation. Consumable supplies are items consumed or worn by operation of materials or equipment, and items used in maintaining the operation of material or equipment, including items such as lubricants, seals, reagents, and testing chemicals used for calibrating or operating the equipment. Include estimated delivery times, shelf life limitations, and special storage requirements.
- G. Submit manufacturer's installation and operation bulletins, diagrams, schematics, and equipment cutaways. Avoid submitting catalog excerpts unless they are the only document available showing identification or description of particular component of the equipment. Where materials pertain to multiple models or types, mark the literature to indicate specific material or equipment supplied. Marking may be in the form of checking, arrows, or underlining to indicate pertinent information, or by crossing out or other means of obliterating information that does not apply to the materials and equipment furnished.
- H. Submit original-quality copies of each approved and accepted Shop Drawing, product data, and other submittal, updated to indicate as-installed condition. Reduced drawings are acceptable only if reduction is to not less than one-half original size and all lines, dimensions, lettering, and text are completely legible on the reduction.
- I. Submit complete electrical schematics and wiring diagrams, including complete point-to-point wiring and wiring numbers or colors between all terminal points.
- J. Programmable Logic Controllers: If programmable logic controllers are furnished
- 1. Submit complete logic listings in one consistent format.
  - 2. Format Requirements:
    - a. For ladder diagram logic, include complete cross-referencing of all logic elements. Annotate all elements with clearly understandable tags or descriptive labels.
    - b. For function block diagram, label each function block with understandable tags or descriptive labels. Describe purpose and action of each function block.
    - c. For sequential function chart, include extensive comments for each step to describe program step function.
    - d. For instruction list and structured text, include extensive comments for each program line to describe program line function.
  - 3. Submit complete programmable logic controller listing of all input/output address assignments, tag assignments, and pre-set constant values, with functional point

descriptions.

4. Submit complete manufacturer's programming manuals.
- K. Copy of warranty bond and service contract as applicable.
- L. When copyrighted material is used in operations and maintenance manuals, obtain copyright holder's written permission to use such material in the operation and maintenance manual.

**PART 2 - PRODUCTS**

NOT USED

**PART 3 - EXECUTION**

NOT USED

END OF SECTION



## SECTION 01810

### COMMISSIONING

#### **PART 1 - GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Commissioning Plan
- B. Functional Completion Testing
- C. Startup
- D. Commissioning
- E. Performance Testing
- F. Operational Demonstration

**1.2** Each VFD will be started, tested, and commissioned separately by the SUPPLIER. Separate trips will therefore be required.

**1.3** Refer to individual specification sections for additional requirements.

##### **1.4 DEFINITIONS**

- A. Commissioning: Commissioning is the series of activities or processes necessary to ensure that equipment and systems are designed, installed, functionally tested, started up and capable of being operated and maintained to perform in conformity with the design intent for the facility improvements. Commissioning includes, but is not limited to factory testing, field testing, dry testing, wet testing with plant water, performance testing, Manufacturer's checkout, and operational demonstration.
- B. Factory Testing: Factory testing is performance testing, operation testing, or documentation verification conducted in the production facility, specialized test facility, or by the equipment manufacturer or supplier. Such testing shall conform to the requirements of the individual sections of the Contract Documents. "Witnessed" factory testing shall mean that the testing is witnessed by the OWNER or his designated representative.
- C. Field Testing: Field testing is performance testing, operation testing, or documentation verification conducted in the field after installation, to provide comparison with the results obtained in the factory testing.
- D. Dry Testing: Dry testing is performed by the SUPPLIER without introducing either process material or other test material into the component, system, or unit process.
- E. Wet Testing: Wet testing is testing performed by the SUPPLIER utilizing plant water in the component, system, or unit process. Tankage shall be filled with plant water to operating level.
- F. Performance Testing: Performance Testing is testing performed by the SUPPLIER to demonstrate the specified throughput of the equipment and unit process systems while maintaining regulatory compliance with Federal, State, and Local government regulations and minimum compliance with the equipment or unit process systems performance requirements and guarantees.

- G. **Manufacturer's Checkout:** Manufacturer's checkout shall be performed directly by the manufacturer. Checkout by the local equipment representative or salesman is not permitted. Checkout shall include, but not be limited to, wiring and power supply, installation, tolerances, clearances, rotation, etc.
- H. **Startup:** Startup shall be defined as the operation of equipment or unit process systems using clean water, air, or other fluids and gases as necessary to demonstrate the operation of the equipment or systems with other equipment that is a part of the Facility. Startup shall be performed by the SUPPLIER, manufacturer, and local equipment representative.
- I. **System:** A "system" includes all required items of equipment, devices, and appurtenances connected so that their operation or function compliments, protects, or controls the operation or function of the others.
- J. **Operational Demonstration:** A commissioning activity performed by the SUPPLIER wherein the OWNER, under the direction of the SUPPLIER, operates and maintains a fully functional component system, unit process for a period of time after stable operation has been achieved. For purposes of this project, the period of time shall be 30 days, unless noted otherwise for specific pieces of equipment.
- K. **Commissioning Plan:** The Commissioning Plan incorporates all aspects of functional completion testing, startup, commissioning, performance testing, training, and reliability tests to ensure the facility operates properly and meets design intent and performance.

### 1.3 SUBMITTALS

- A. **Field Installation Reports –** Submit reports by Manufacturer's Representative in accordance with the Contract Documents.
- B. **Detailed Commissioning Plan –** Submit detailed commissioning plan in accordance with the Contract Documents 30 days in advance of starting, testing and placing equipment into operation.
- C. **Start up and Testing Documentation:** SUPPLIER shall prepare and submit all documentation for review and approval. The documentation shall include, but not be limited to, the following:
  - 1. Develop blank testing forms specific to each item of equipment or system to be filled out during start-up and testing.
    - a. All forms must be approved by ENGINEER and OWNER prior to use.
  - 2. Field testing plans, dry testing plans and wet testing plans that describe in detail the proposed testing procedures that will show the equipment and systems performance is in accordance with the requirements of the Contract Documents.
  - 3. Field testing, dry testing and wet testing reports including recorded test data, performance tolerances, observations, measurements taken, problems and modifications or corrective action taken for the equipment and systems to perform in accordance with the Contract Documents.
  - 4. Certification by the preparer that he/she is the person responsible for the data, and that the data is authentic and accurate.
  - 5. Certification by the equipment supplier that the equipment or the unit process

systems were operated continuously for the specified period and that the equipment or unit process systems operated in compliance with the specified operating conditions, parameters and performance, and that the equipment or unit process systems are suitable for Operational Demonstration.

D. Develop performance testing plans and operational demonstration plans describing in detail, coordinated, sequential testing and demonstration of each system to be tested. Performance testing plan and operational demonstration plan shall be specific to the system or equipment item to be tested, and shall identify by specific equipment or tag number each device or control station to be manipulated or observed during testing, and specific results to be observed or obtained. Performance testing plans and operational demonstration plans shall include:

1. Summary of results of field testing, dry testing and wet testing.
2. Calibration of all field instruments and control devices.
3. Description of and information on temporary systems, equipment, and devices proposed for performance Testing and Operational Demonstrations, including calibration data for temporary instrumentation and controls.
4. Description of data reduction required, if any, and proposed time between collection of data and submittal of results to ENGINEER.
5. Summary of criteria for acceptance of test results. Summary shall include performance tolerances (if any) included in the Contract Documents. Where performance tolerances are not included in the Contract Documents, testing plans shall include proposed performance tolerances for approval by OWNER and ENGINEER.

E. Following a successful Operational Demonstration, a summary report containing the following, at a minimum, shall be provided by the SUPPLIER:

1. Equipment, systems and plant treatment trains started-up and commissioned.
2. Start-up and commissioning dates.
3. Equipment, systems and performance criteria tested, clearly showing requirements and field data that verifies requirements were met.
4. Names of witnesses for start-up and commissioning.
5. Any repairs, corrections, or modifications required for the equipment or unit process systems to successfully complete start-up and commissioning.
6. Loop diagrams accurately depicting the installed condition of instrumentation and controls.
7. Any other important Operational Demonstration information.
8. Report Appendix containing the following, as a minimum:
  - a. A summary of all testing data used and calculations, including source, formulas with all terms defined.
  - b. Copies of all raw field data sheets, including those indicating sampling point locations, and notes.

- c. Production and operational data.
- d. Calibration sheets for equipment.
- e. Copies of calibration records for instrumentation.

## 1.5 COMMISSIONING PLAN

- A. The SUPPLIER shall be responsible for preparing, coordinating, and executing the Plan.
  - 1. An initial draft Plan for the Facility shall be completed and submitted by the SUPPLIER to the OWNER/ENGINEER for review at least 30 days prior to the expected commencement of commissioning. The SUPPLIER shall incorporate the OWNER'S/ENGINEER's comments into the revised Plan and reissue the Plan to the ENGINEER and OWNER.
- B. The SUPPLIER may require assistance from the OWNER's operating and maintenance staff in commissioning and performance testing activities specified herein. Activities requiring OWNER's staff shall be specifically noted in the Plan.
- C. The Plan shall define:
  - 1. A chronological schedule of all testing and inspection activities.
  - 2. A checklist of all inspection and testing activities broken down by location, discipline, system, and device or item.
  - 3. All blank forms proposed by the SUPPLIER for verification or recording of the functional completion testing, startup, commissioning and performance testing.
  - 4. A list of all supplier certifications, including those required by the applicable technical specifications. Provisions shall also be included for retesting, in the event it is required.
  - 5. A list of participants in functional completion testing, startup, commissioning, and performance testing.
  - 6. A list of special test equipment required for functional completion testing, startup, commissioning, and performance testing.
  - 7. Sources of the test media (water, power, air.) for functional completion testing.
  - 8. The proposed method of delivery of the media to the equipment to be tested during functional completion testing, startup, commissioning, and performance testing.
  - 9. Temporary or interim connections for the sequencing of multiple units during functional completion testing, startup, commissioning, and performance testing.
- D. The SUPPLIER shall designate, in the Plan, a Testing and Checkout Coordinator, to coordinate and manage the activities defined in the Plan.

## 1.6 ROLES AND RESPONSIBILITIES

- A. SUPPLIER shall provide competent, qualified representatives of material, equipment, and system manufacturers to provide services specified, including supervising installation,

adjusting, starting-up, and testing of materials and equipment.

- B. The SUPPLIER shall provide the services as follows:
  - 1. Assistance during installation as specified in Divisions 1 through 17 and as specified herein.
  - 2. Field Testing as specified in Divisions 1 through 17 and as specified herein.
  - 3. Startup as specified in Divisions 1 through 17 and as specified herein.
  - 4. Commissioning as specified in Divisions 1 through 17 and as specified herein.
- C. The Supplier's representative's activities required by this Section are in addition to the requirements for vendor training and other services specified elsewhere in the Contract Documents.
- D. The OWNER/ENGINEER will review and comment on the SUPPLIER's deliverables, participate in the physical inspection activities, and witness the shop and field testing, and witness functional testing. The OWNER'S/ENGINEER's right to perform inspections, witness tests or monitor or assess the Work and activities does not relieve the SUPPLIER of its obligation to comply with the requirements of the Contract Documents nor does it imply completion of the Work.

#### **1.7 FUNCTIONAL COMPLETION TESTING**

- A. Functional Completion Testing shall be completed as construction and installation of equipment is completed to demonstrate that the equipment is ready for equipment and systems startup.
- B. Functional Completion Testing shall be done in a coordinated manner based on the Plan prepared by the SUPPLIER.
- C. The OWNER's operating and maintenance staff shall be allowed to observe for the purposes of familiarization and training.
- D. Functional Completion Testing procedures and documentation forms shall be developed by the SUPPLIER. The procedures shall include a listing of items inspected for Functional Completion Testing.
- E. If any equipment or unit process systems do not meet Functional Completion Testing requirements, it shall be the responsibility of the SUPPLIER and/or equipment suppliers to make the necessary corrections or replacements and repeat the test.
- F. The equipment and unit process systems shall not be started up or put into service until the Functional Completion Testing is completed as evidenced by a completed Functional Completion Testing certificate for the equipment or subsystem.
- G. A Functional Completion Testing Certificate shall be prepared by the SUPPLIER for each piece of equipment or system and submitted to the ENGINEER and OWNER for review.

#### **1.8 COMMISSIONING**

- A. All equipment shall be commissioned.
- B. Commissioning activities for the project shall not be initiated until the requirements of Startup are completed for the equipment or unit process systems.

- B. The requirements of this section shall be satisfactorily completed prior to beginning Performance Testing for equipment and unit process systems.
- C. Commissioning shall be used by the SUPPLIER and equipment or unit process suppliers to adjust, fine tune, modify and prepare the equipment or system for continuous operation and Performance Testing.
- D. Equipment shall not be operated without the guidance of qualified personnel having the knowledge and experience necessary to conduct proper operation thereof and obtain valid results.
- E. All required adjustments, tests, operation checks, and Startup and Commissioning activities shall be provided by qualified personnel.
- F. SUPPLIER shall be responsible for planning, supervising, and executing the Startup and Commissioning of the equipment and unit process systems with the assistance of equipment or unit process systems suppliers in accordance with the Plan.
- G. The OWNER's operating and maintenance staff shall be allowed to observe for the purposes of familiarization and training.
- H. Commissioning Certificates for each piece of equipment or unit process shall be completed and submitted by the SUPPLIER to the ENGINEER and OWNER for review.

**1.8 PERFORMANCE TESTING AND OPERATIONAL DEMONSTRATION**

- A. SUPPLIER shall demonstrate the operation of all equipment and systems. SUPPLIER shall provide all labor, materials, services, equipment, and incidentals required for Performance Testing and Operational Demonstrations as indicated in the Contract Documents. This Performance Testing and Operational Demonstrations shall be conducted, coordinated and recorded by the SUPPLIER in accordance with the requirements specified herein and in cooperation with the OWNER and ENGINEER. The project will not be considered Substantially Complete until the completion of the performance testing and operational demonstration.
- B. Objectives of Performance Testing and Operational Demonstrations are to:
  - 1. Demonstrate to the satisfaction of the OWNER and ENGINEER that equipment and systems tested comply with all functional and performance requirements in the Contract Documents.
  - 2. Establish baseline operating conditions for OWNER's use in establishing standard operating procedures and preventative maintenance programs.
  - 3. The Performance Testing shall maintain conformance with performance tolerances for a period of not less than 7 days. If a testing failure occurs during the 7 day testing period, the malfunction shall be repaired, and the 7 day testing period shall restart.
  - 4. The Operational Demonstrations shall maintain conformance with the performance tolerances for a period of not less than 30 days. If a testing failure occurs during the 30 day testing period, the malfunction shall be repaired, and the 30 day testing period shall restart.
- E. Sequence: The following general sequence applies to Performance Testing and Operational Demonstrations:

1. Furnish submittals required prior to Performance Testing, in accordance with the Contract Documents.
2. Furnish acceptable operations and maintenance manuals in accordance with the Contract Documents.
3. Training of operations and maintenance personnel in accordance with Section 01820, Demonstration and Training. Training must occur prior to the Operational Demonstration.
4. Proceed with Performance Testing in accordance with the Contract Documents, simulating the range of actual operating conditions to the greatest extent possible.
5. Complete site quality control Work for individual equipment items and systems. Field inspection, testing, and adjustments shall be signed off by approved representative of the Manufacturer, indicating that the equipment, components, systems, or unit processes meets the Manufacturer's requirements.
6. Following acceptance of the Performance Testing by the ENGINEER and OWNER, SUPPLIER shall initiate a 30-day Operational Demonstrations, as described herein.
7. Successful completion of Operational Demonstration is part of the requirements to achieve Substantial Completion of the pump station.

## **PART 2 - PRODUCTS**

NOT USED

## **PART 3 - EXECUTION**

### **3.1 STARTUP**

- A. The SUPPLIER shall inspect equipment and systems prior to each start-up and verify their readiness for start-up. Conditions hazardous to equipment or personnel shall be brought to the OWNER's attention by the SUPPLIER prior to start-up of equipment.
- B. Start-up operations shall not precede using temporary power or temporary instrumentation and control wiring. All electrical and control connections shall be permanent and complete, and all such electrical components and equipment fully functional.
- C. Use of repair parts during start-up operations shall not be permitted, except in such situations where the actual on-site verification of such repair parts' operability is specified.
- D. The SUPPLIER shall verify that all initial copies of the maintenance and operating instructions have been received, from the OWNER/ENGINEER, an acceptable disposition as defined in Section 01330, Submittal Procedures, and the only outstanding item is the field verification of the maintenance and operating instructions.

### **3.2 COMMISSIONING**

- A. On successful completion of startup, the SUPPLIER shall begin commissioning of the

FURNISHING OF VFDS FOR WTP E.H.S.

equipment and systems, wherein the equipment and systems are subjected to full operation. Adjustments shall be made as necessary and the equipment and system shall be optimized and brought into compliance with design criteria in preparation for performance testing and the Operational Demonstration specified within the Contract Documents.

- B. The SUPPLIER shall coordinate all Commissioning activities for equipment and systems in accordance with the accepted commissioning plan.
- C. Commissioning shall show that the equipment and unit process systems are capable of continuous operation using process liquids and solids, chemicals, and utilities; and that the flows, operating parameters and performance requirements have been demonstrated for a minimum of seven days of continuous operation, or the period required in the equipment specifications, whichever is longer.

### **3.3 PERFORMANCE TESTING AND OPERATIONAL DEMONSTRATION**

- A. SUPPLIER shall perform Operational Demonstration of the work. Unless otherwise specified, the Operational Demonstration shall be a continuous 30-day, (720 hours) period during which the work is operated and maintained in a continuously on-line, fully functional process status.
- B. The Operational Demonstrations shall encompass the entire work, or the portion thereof designated for Substantial Completion. The Operational Demonstrations shall include all the equipment and systems.
- C. During the entire 30 day Operational Demonstration period, the operation of equipment will be assumed by the OWNER's personnel, under the direction of the SUPPLIER.
- D. Prior to the Operational Demonstrations, all parts of the work designated for the operational demonstration shall have passed all required tests as specified. No testing shall be allowed during the Operational Demonstrations.
- E. During the Operational Demonstration period, SUPPLIER shall obtain baseline operating data on equipment.
- F. If during the Operational Demonstration, any part of the work fails to fully conform to the requirements of the Contract Documents, the Operational Demonstration shall be considered to have failed, and the work shall not be considered to be Substantially Complete, and the OWNER/ENGINEER shall so notify the SUPPLIER in writing. If, during the Operation Demonstration, the provisions of the General Conditions are evoked to stop the work, the Operational Demonstration will also be considered to have failed.
- G. Re-testing: Because of Disputed Testing Results or Procedures: In the case of an otherwise satisfactory Operational Demonstration, when there is doubt, dispute, or difference between OWNER/ENGINEER and SUPPLIER regarding testing results, methods, or equipment used in the Operational Demonstration testing, OWNER/ENGINEER may order SUPPLIER to repeat the testing.
- H. Post-test Inspection: After completing Operational Demonstration testing, check equipment for proper alignment and realign, as required. Check equipment for loose connections, unusual movement, and other indication of improper operating characteristics. Disassemble and inspect equipment and devices that exhibit unusual or unacceptable operating characteristics. Repair or replace defective Work to conform to the Contract Documents at no additional cost to OWNER.
- I. Upon failure of the Operational Demonstration, the SUPPLIER shall promptly remedy any



defects in the work and shall promptly reschedule and re-start the complete 30-day, (720 hours) Operational Demonstration time period. No Operational Demonstration time will be considered to have accrued to any part of the work by reason of a failed Operational Demonstration.

- J. Completion of the Operational Demonstration does not relieve the SUPPLIER of its other requirements for Substantial Completion as required by the Contract Documents.

END OF SECTION

## SECTION 01820

### DEMONSTRATION AND TRAINING

#### **PART 1 - GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Training
- B. Instructor Manual
- C. Trainee Manual

##### **1.2 SUBMITTALS**

- A. Submit the following in accordance with Section 01330:
  - 1. Submit an outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
  - 2. Submit an electronic copy of each training module.
  - 3. On each copy of the training module, provide an applied label with the following information:
    - a. Name of Project.
    - b. Training Session Name.
    - c. Name of Supplier/Manufacturer.
    - d. Name of Local Manufacturer's Representative.
  - 4. At completion of training, submit complete training manual(s) for Owner's use prepared and bound in format matching operation and maintenance manuals and in a PDF electronic file.

##### **1.3 COORDINATION**

- A. SUPPLIER to coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of the Owner's personnel. Contractor shall schedule training sessions at least 30 days in advance.
- B. SUPPLIER shall provide a minimum of two (2) training sessions. Training sessions shall be on non-consecutive weeks to accommodate shift changes at the plant.
- C. Training sessions shall be provided prior to the operational demonstration.
- D. SUPPLIER to coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

#### **PART 2 - PRODUCTS**

##### **2.1 TRAINEE MANUAL**

- A. Develop an instruction program that includes individual training modules for each system,

as required in the individual Specification Sections.

- B. The SUPPLIER shall submit a Trainee Manual for each curriculum that includes all of the information specified below and written at the journeyman level for electrician specialists, mechanic specialists and instrument technicians, and for water treatment plant operators, or other disciplines, depending upon the target audience.
- C. The Trainee Manual shall be consistent with the nomenclature and content of the accepted Contractor O&M Manuals required in Specification Section 01781. The O&M Manual cannot be substituted for the Instructor Manual or Trainee Manual.
- D. The purpose of the Trainee Manual is to provide an organized package of information for use by trainees during the training sessions and as reference Water Treatment Plant (New) material for operation and maintenance in the future. The Trainee Manual shall include:
  - 1. Description of the equipment.
  - 2. Parts and equipment graphics including "exploded" views.
  - 3. Safety procedures.
  - 4. Pre-startup checks.
  - 5. Startup procedures.
  - 6. Operation and monitoring procedures including normal operating parameters, and the operating limits of the equipment.
  - 7. Shutdown procedures.
  - 8. Troubleshooting procedures.
  - 9. Non-routine emergency procedures.
  - 10. Safety/Protective equipment required by Trainees.
- E. All manuals shall be presented in electronic format per the requirements of Specification Section 01330. All equipment shall be cross-referenced to the equipment tag identification numbers.
- F. The SUPPLIER shall provide at least one hard copy of each Trainee Manual for each trainee (approximately 30 copies). Hard copies shall be on 8.5" x 11" paper in a 3-hole D-ring binder.

## **PART 3 - EXECUTION**

### **3.1 FACILITIES FOR TRAINING**

- A. Use Owner's designated training facilities for specified field training programs. Facilities shall include the project site, which shall be used for hands-on training programs. Coordinate use of Owner's facilities with Owner.

### **3.2 TRAINING**

- A. Training shall include the following:
  - 1. Equipment Overview (required for all types of operations and maintenance training):
    - a. Describe equipment's operating (process) function and performance objectives.
    - b. Describe equipment's fundamental operating principles and dynamics.
    - c. Identify equipment's mechanical, electrical, and electronic components

and features. Group related components into subsystems and describe function of subsystem and subsystem's interaction with other subsystems.

- d. Identify all support equipment associated with operation of subject equipment.
- e. Identify and describe safety precautions and potential hazards related to operation.
- f. Identify and describe in detail safety and control interlocks.

## 2. Operations Training:

- a. Describe operating principles and practices.
- b. Describe routine operating, start-up, and shutdown procedures.
- c. Describe abnormal or emergency start-up, operating, and shutdown procedures that may apply.
- d. Describe alarm conditions and responses to alarms.
- e. Describe routine monitoring and recordkeeping procedures.
- f. Describe recommended housekeeping procedures.
- g. Describe how to determine if corrective maintenance or an operating parameter adjustment is required.

## 3. Maintenance Training:

- a. Describe preventative maintenance inspection procedures required to: inspect equipment in operation, identify potential trouble symptoms and anticipate breakdowns, and forecast maintenance requirements (predictive maintenance).
- b. Define recommended preventative maintenance intervals for each component.
- c. Describe replacement part recommendations and limitations.
- d. Describe appropriate cleaning practices and recommend intervals.
- e. Identify and describe use of special tools required for maintenance of equipment.
- f. Describe component removal, installation, and disassembly and assembly procedures.
- g. Perform "hands-on" demonstrations of preventive maintenance procedures.
- h. Describe recommended measuring instruments and procedures, and provide instruction on interpreting alignment measurements, as appropriate.
- i. Define recommended torqueing, mounting, calibrating, and aligning procedures and settings, as appropriate.
- j. Describe recommended procedures to check and test equipment following corrective maintenance.



## SECTION 16480

### VARIABLE-FREQUENCY MOTOR CONTROLLERS

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Section includes separately enclosed, preassembled, combination VFDs, bypass contactor (as a bid alternate), rated 600 V and less, for speed control of three-phase, squirrel-cage induction motors originally installed approximately in 1993.

##### **1.2 DEFINITIONS**

- A. CE: Conformance Europeene (European Compliance).
- B. CPT: Control power transformer.
- C. DDC: Direct digital control.
- D. EMI: Electromagnetic interference.
- E. OCPD: Overcurrent protective device.
- F. PID: Control action, proportional plus integral plus derivative.
- G. RFI: Radio-frequency interference.
- H. VFD: Variable-frequency Drive motor controller.

##### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type and rating of VFD indicated.
- B. Shop Drawings: For each VFD indicated.
  - 1. Include details of equipment assemblies. Indicate dimensions, weights, loads, and required clearances, method of field assembly, components, and location and size of each field connection.
  - 2. Include diagrams for power, signal, and control wiring.
  - 3. Provide recommended spare parts list in with submittal.
  - 4. Installation and Maintenance manuals shall be shipped with the VFD and shall include detailed installation, start-up, and checkout procedures and adjustment and troubleshooting information.
  - 5. Submit evidence that the equipment will be provided with all specified controls, features, options and accessories.
  - 6. Submit certification that the equipment is designed and manufactured in conformance with all applicable codes and standards.

7. Certified copies of test results shall be submitted for all tests specified in this section.
8. The VFD will be certified as compatible with the existing motors:
  - a. Titan Inverter Duty Motor, Model G69747
  - b. Torque: 1554 FT-lbs, HZ Range: 30-60, RPM: 591-1183, Volts: 460, Amps: 420
  - c. HP: 350 HP, HZ: 60, Frame: 5010
  - d. Volts: 460, Amps: 400, Rating: Cont.
  - e. Temp Rise: 85°C @ 115 % Load by Resist
  - f. RPM: 1183, SF: 1.15, PH 3, Max AMB: 40°C, Insulation Class F, Code G
  - g. Type HI Shaft End BRG 6222-J/C3
  - h. Encl WPI, opposite end bearing 6316-J/C3
  - i. ID# W03W0570084P-1

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For testing agency.
- B. Seismic Qualification Bracing: For each VFD, accessories, and components, from manufacturer.
  1. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  2. Detailed description of equipment anchorage devices to allow for 100 degree tipping of unit.
- C. Product certificates.
- D. Field quality-control reports.

#### **1.5 CLOSEOUT SUBMITTALS**

- A. Operation and maintenance data: Provide the following.
  1. Five (5) hard copies in 3-ring binders with Table of Contents and Cover Page.
  2. One (1) electronic copy; searchable PDF.
- B. Record Drawings: Provide and include all programming and set points established in the field as part of Startup, Testing and Commissioning.

## **1.6 QUALITY ASSURANCE**

- A. Testing Agency Qualifications: Member Company of NETA or an NRTL.

## **1.7 CODES AND STANDARDS**

- A. The VFD shall comply with the applicable requirements of the latest standards of ANSI, IEEE, NEMA, the NEC, and be UL/CSA listed.

## **1.8 WARRANTY**

- A. Special Warranty: Manufacturer agrees to repair or replace VFDs that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Two years from date of Substantial Completion. Provide pricing for five year warranty from date of Substantial Completion as an alternate.

## **PART 2 – PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Allen-Bradley
- B. Siemens
- C. Square D Group Schneider
- D. Toshiba

### **2.2 SYSTEM DESCRIPTION**

- A. General Requirements for VFDs:
  - 1. VFDs and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
  - 2. Comply with NEMA ICS 7, NEMA ICS 61800-2, and UL 508A.
- B. Application: variable torque.
- C. VFD Description: Variable-frequency motor controller, consisting of power converter that employs pulse-width-modulated inverter, factory built and tested 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.
  - 1. Units suitable for operation of NEMA MG 1 motors.



2. Listed and labeled for integrated short-circuit current (withstand) rating by an NRTL acceptable to authorities having jurisdiction.
  3. VFD shall be an 18 pulse system.
  4. Insulated Gate Bipolar Transistors (IGBTs) shall be used in the inverter section. Bipolar Junction Transistors, GTOs or SCRs will not be acceptable.
  5. Provide 3% line reactor and dV/dT filter.
- D. 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.
- E. Output Rating: Three phase; 10 to 60 Hz, with voltage proportional to frequency throughout voltage range; maximum voltage equals input voltage.
- F. 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 3 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 kA.
  7. Ambient Temperature Rating: Not less than 32 degrees Fahrenheit and not exceeding 104 degrees Fahrenheit.
  8. Humidity Rating: Less than 95 percent (noncondensing).
  9. Altitude Rating: Not exceeding 3,300 feet.
  10. Vibration Withstand: Comply with NEMA ICS 61800-2.
  11. Overload Capability: 1.5 times the base load current for 60 seconds; minimum of 1.8 times the base load current for three seconds.
  12. Starting Torque: Minimum 100 percent of rated torque from 3 to 60 Hz.
  13. Speed Regulation: Plus or minus 5 percent.
  14. Output Carrier Frequency: Selectable; 0.5 to 15 kHz.
  15. Stop Modes: Programmable; includes fast, free-wheel, and dc injection braking.

16. Total current harmonic distortion shall not exceed the values in Table 10.3 of IEEE – 519 at the point of connection.
  17. Noise: 80 dB or less.
- G. Inverter Logic: Microprocessor based, 32 bit, isolated from all power circuits.
- H. Isolated Control Interface: Allows VFDs to follow remote-control signal over a minimum 40:1 speed range.
1. Signal: Electrical.
- I. Internal Adjustability Capabilities:
1. Minimum Speed: 5 to 50 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.
- J. Self-Protection and Reliability Features:
1. Surge Suppression: Factory installed as an integral part of the VFD, complying with UL 1449 SPD, Type 1 or Type 2.
  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. Motor and Pump Vibration Detection Protection, as recommended by the Hydraulic Institute, three points (as an alternate).
  6. 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. System shall work with existing RTDs:
    - a. Six stator winding RTDs, two per phase (Nickel,  $120 \pm .6 \Omega$  at  $0^{\circ}\text{C}$  with a TCR  $\Omega/\Omega^{\circ}\text{C}$  of 0.00672)
  7. Critical frequency rejection, with three selectable, adjustable deadbands.
  8. Instantaneous line-to-line and line-to-ground overcurrent trips.

9. Loss-of-phase protection.
  10. Reverse-phase protection.
  11. Short-circuit protection.
  12. Motor-overtemperature fault.
- K. Automatic Reset/Restart: Attempt three restarts after VFD fault or on return an interruption and before shutting down for manual reset or fault correction; adjustable delay time between restart attempts.
- L. Power-Interruption Protection: To prevent motor from re-energizing after a power interruption until motor has stopped, unless "Bidirectional Autospeed Search" feature is available and engaged.
- 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 the VFD, 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 and OCPD: UL 489, thermal-magnetic circuit breaker with pad-lockable, door-mounted handle mechanism.
1. Disconnect Rating: Not less than 115 percent of VFD input current rating.
  2. Disconnect Rating: Not less than 115 percent of NFPA 70 motor full-load current rating or VFD input current rating, whichever is larger.
  3. Auxiliary contacts: NO or NC, arranged to activate before switch blades open.
  4. Auxiliary contacts "a" and "b" arranged to activate with circuit-breaker handle.
  5. NC alarm contact that operates only when circuit breaker has tripped.

## 2.3 CONTROLS AND INDICATION

- A. Status Lights: Door-mounted LED indicators displaying the following conditions:
1. Power on.
  2. Run.

3. Overvoltage.
  4. Line fault.
  5. Overcurrent.
  6. External fault.
- 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, include keys for HAND, OFF, and AUTO modes.
  2. Security Access: Provide electronic security access to controls through identification and password with at least one level 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. Motor torque (percent).
  6. Fault or alarming status (code).
  7. PID feedback signal (percent).
  8. DC-link voltage (V dc).
  9. Set point frequency (Hz).

10. Motor output voltage (V ac).
  11. Temperature (Deg F)
- E. Control Signal Interfaces:
1. Electric Input Signal Interface:
    - a. A minimum of two programmable analog inputs: 4- to 20-mA dc.
      - 1.) Speed Command
    - b. A minimum of six multifunction programmable digital inputs.
      - 1.) Start
      - 2.) Stop
  2. Remote Signal Inputs: Capability to accept any of the following speed-setting input signals from the control system:
    - a. 0- to 10-V dc.
    - b. 4- to 20-mA dc.
    - c. Potentiometer using up/down digital inputs.
    - d. Fixed frequencies using digital inputs.
  3. Output Signal Interface: A minimum of one programmable analog output signal(s) (4- to 20-mA dc), which can be configured for any of the following:
    - a. Output frequency (Hz).
    - b. Output current (load).
    - c. DC-link voltage (V dc).
    - d. Motor torque (percent).
    - e. Motor speed (rpm).
    - f. Set point frequency (Hz).
  4. Output Signal Interface: A minimum of six programmable digital output signal(s), which can be configured for the following:
    - a. Motor Running
    - b. VFD System Alarm
    - c. VFD in bypass (as an alternate)
    - d. 15 AMP (120/240VAC) rated contact for motor heater

- e. 15 AMP (120/240VAC) rated contact for seal water solenoid
  - f. Spare
- F. VFD shall be provided with the following communications ports: RS-232 port, USB 2.0 port, and Ethernet/IP. The RS-232 port and the Ethernet/IP port shall be for control communication and not just programming interfaces.

## 2.4 BYPASS SYSTEMS (As an Alternate)

- A. Bypass Operation: Manually transfers motor between power converter output and bypass circuit. Unit is capable of stable operation (starting, stopping, and running) with motor completely disconnected from power converter.
- B. Bypass Mode: Manual operation only; requires local operator selection at VFD. Transfer between power converter and bypass contactor, and retransfer shall only be allowed with the motor at zero speed.
- C. Bypass controller: Two-contactor style bypass allows motor operation via the power converter or the bypass controller.
  - 1. Bypass Contactor: Load-break, NEMA-rated contactor.
  - 2. Output Isolating Contactor: Non-load-break, NEMA-rated contactor.
  - 3. Isolating Switch: Non-load-break switch arranged to isolate power converter and permit safe troubleshooting and testing of the power converter, both energized and de-energized, while motor is operating in bypass mode; pad-lockable, door-mounted handle mechanism.
- D. Bypass Contactor Configuration: Full-voltage (across-the-line) type.
  - 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.
    - a. Operating Voltage: Depending on contactor NEMA 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: 100 VA.
6. Overload Relays: NEMA ICS 2.

## 2.5 ENCLOSURES

- A. VFD Enclosures: NEMA 250, to comply with environmental conditions at installed location.
  1. Type 12. Add protection from circulating dust and dripping/spraying water.
- B. Plenum Rating: UL 1995; NRTL certification label on enclosure, clearly identifying VFD as "Plenum Rated."
- C. Tilting: Equipment shall be rated to be tipped 100 degrees in all directions during installation. Price shall include cost associated with providing field service technicians for the removal and reinstallation of any components within the enclosure that maybe required to allow the enclosure to be tipped. Warranty shall not be affected by tipping requirements.
- D. Maximum allowable dimensions of enclosure: 78" width by 100" height by 32" depth.
  1. The addition of the one (1) bypass contactor (Alternate No. 1) shall not increase the maximum allowable dimensions of the VFD enclosure.
- E. Maximum allowable available width for all equipment: 156" (13-feet)

## 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: Unguarded.
  2. Pilot Lights: Push to test, LED.
  3. Selector Switches: Rotary type.
- B. NC Bypass contactor auxiliary contact(s).
- C. Control Relays: Auxiliary and adjustable solid-state time-delay relays.
- D. 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.
- E. Supplemental Digital Meters:
1. Elapsed-time meter.
  2. Kilowatt meter.
  3. Kilowatt-hour meter.
- F. Breather and drain assemblies, to maintain interior pressure and release condensation in NEMA 250, Type 12 enclosures installed outdoors or in unconditioned interior spaces subject to humidity and temperature swings.
- G. Filters: VFD manufacturer shall provide sufficient supply and exhaust fan sizing to allow the owner to install furnace-type filters over the air supply openings. The installation of such filters shall not reduce VFD performance nor void any manufacturer warranty.

## **2.7 CONTROL WIRING INSTALLATION**

- A. Bundle, train, and support wiring in enclosures.

## **2.8 IDENTIFICATION**

- A. Identify VFDs, components, and control wiring.
1. Label each enclosure-mounted control and pilot device.
  2. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

## **2.9 SPARE PARTS**

- A. Provide the following:
1. One (1) box of fuses for each type and size used.
  2. Two (2) timers of each type used.
  3. Six (6) relays of each type used.
  4. Two (2) sets of overloads.

## **2.10 START UP AND COMMISSIONING**

- A. An experienced, competent, and authorized representative of the manufacturer or supplier of each item of equipment shall visit Site of Work a minimum of four (4) times, twice per VFD; or more as required. The equipment supplier's representative



shall revisit Site as often as necessary until all trouble is corrected and the equipment installation and operation is satisfactory to OWNER.

- B. The VFDs will not be installed at the same time. The installation of the second VFD will only begin after the successful startup and acceptance of the first VFD. Separate visits to the site for each VFD will be required.
- C. Manufacturer's representative shall provide all necessary tools and testing equipment required including noise level and vibration sensing equipment.
- D. Each equipment supplier's representative shall furnish to OWNER a written report certifying that the equipment:
  - 1. Has been properly installed and lubricated;
  - 2. Is balanced and in accurate alignment;
  - 3. Is free from any undue stress imposed by connecting piping or anchor bolts;
  - 4. Has been operated under full load condition and that it operated satisfactorily to OWNER;
  - 5. That OWNER's operators have been instructed in the proper maintenance and operation of the equipment; and
  - 6. Furnish OWNER a copy of all test data recorded during the installation check including noise level and vibration readings.

## **2.11 OPERATION AND MAINTENANCE TRAINING**

- A. Provide services of manufacturer's service representative to instruct OWNER's personnel in operation and maintenance of equipment. Training shall include start-up and shutdown, servicing and preventative maintenance schedule and procedures, and troubleshooting procedures plus procedures for obtaining repair parts and technical assistance.
  - 1. Manufacturer's representative shall provide in quote two eight hour days (at least one week apart).
  - 2. Review operating and maintenance data contained in the operating and maintenance manuals.

END OF SECTION 16480

## **Appendix A**

### **Insurance and Endorsement Template**



DESCRIPTIONS (Continued from Page 1)

policy provisions of the general liability and automobile liability policies as required by written contract. General Liability policy evidenced herein is primary to other insurance available to an additional insured but only in accordance with the policy's provisions as required by written contract. A waiver of subrogation is granted in favor of City of Ann Arbor, Michigan in accordance with the policy provisions of the General Liability, Auto Liability and Workers Compensation policies as required by written contract. 30 Day Notice of Cancellation applies. (11/15)

**THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.**  
**CONTRACTOR'S BLANKET ADDITIONAL INSURED ENDORSEMENT**

This endorsement modifies insurance provided under the following:

**COMMERCIAL GENERAL LIABILITY COVERAGE FORM**

<b>Policy Number</b>	<b>Agency Number</b>	<b>Policy Effective Date</b>
<b>Policy Expiration Date</b>	<b>Date</b>	<b>Account Number</b>
<b>Named Insured</b>	<b>Agency</b>	<b>Issuing Company</b>

1. a. **SECTION II - WHO IS AN INSURED** is amended to add as an insured any person or organization:
  - (1) Whom you are required to add as an additional insured on this policy under a written contract or written agreement relating to your business; or
  - (2) Who is named as an additional insured under this policy on a certificate of insurance.
- b. The written contract, written agreement, or certificate of insurance must:
  - (1) Require additional insured status for a time period during the term of this policy; and
  - (2) Be executed prior to the "bodily injury", "property damage", or "personal and advertising injury" leading to a claim under this policy.
- c. If, however:
  - (1) "Your work" began under a letter of intent or work order; and
  - (2) The letter of intent or work order led to a written contract or written agreement within 30 days of beginning such work; and
  - (3) Your customer's customary contracts require persons or organizations to be named as additional insureds;

we will provide additional insured status as specified in this endorsement.

2. **SECTION II - WHO IS AN INSURED** is amended to add the following:  
 If the additional insured is:
  - a. An individual, their spouse is also an additional insured.
  - b. A partnership or joint venture, members, partners, and their spouses are also additional insureds.
  - c. A limited liability company, members and managers are also additional insureds.
  - d. An organization other than a:
    - (1) Partnership;
    - (2) Joint venture; or
    - (3) Limited liability company;

executive officers and directors of the organization are also additional insureds. Stockholders are also additional insureds, but only with respect to their liability as stockholders.
  - e. A trust, trustees are also insureds, but only with respect to their duties as trustees.

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**3. The insurance provided under this endorsement is limited as follows:**

- a. That person or organization is an additional insured only with respect to liability arising out of:
  - (1) Premises you:
    - (a) Own;
    - (b) Rent;
    - (c) Lease; or
    - (d) Occupy; or
  - (2) Ongoing operations performed by you or on your behalf. If, however, the written contract, written agreement, or certificate of insurance also requires completed operations coverage, we will also provide completed operations coverage for that additional insured.
- b. Premises, as respects paragraph **3.a.(1)** above, include common or public areas about such premises if so required in the written contract or written agreement.
- c. Additional insured status provided under paragraphs **3.a.(1)(b)** or **3.a.(1)(c)** above does not extend beyond the end of a premises lease or rental agreement.
- d. Ongoing operations, as respects paragraph **3.a.(2)** above, does not apply to "bodily injury" or "property damage" occurring after:
  - (1) All work to be performed by you or on your behalf for the additional insured(s) at the site of the covered operations is complete, including related materials, parts or equipment (other than service, maintenance or repairs); or
  - (2) That portion of "your work" out of which the injury or damage arises is put to its intended use by any person or organization other than another contractor working for a principal as a part of the same project.
- e. The limits of insurance that apply to the additional insured are the least of those specified in the:
  - (1) Written contract;
  - (2) Written agreement;
  - (3) Certificate of insurance; or
  - (4) Declarations of this policy.

The limits of insurance are inclusive of and not in addition to the limits of insurance shown in the Declarations.
- f. The insurance provided to the additional insured does not apply to "bodily injury", "property damage", or "personal and advertising injury" arising out of an architect's, engineer's, or surveyor's rendering of, or failure to render, any professional services, including but not limited to:
  - (1) The preparing, approving, or failing to prepare or approve:
    - (a) Maps;
    - (b) Drawings;
    - (c) Opinions;
    - (d) Reports;
    - (e) Surveys;
    - (f) Change orders;
    - (g) Design specifications; and
  - (2) Supervisory, inspection, or engineering services.

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- g. **SECTION IV – COMMERCIAL GENERAL LIABILITY CONDITIONS**, paragraph 4. **Other Insurance** is deleted and replaced with the following:

**4. Other Insurance.**

Coverage provided by this endorsement is excess over any other valid and collectible insurance available to the additional insured whether:

- a. Primary;
- b. Excess;
- c. Contingent; or
- d. On any other basis;

unless the written contract, written agreement, or certificate of insurance requires this insurance be primary. In that case, this insurance will be primary without contribution from such other insurance available to the additional insured.

- h. If the written contract, written agreement, or certificate of insurance as outlined above requires additional insured status by use of CG 20 10 11 85, then the terms of that endorsement, shown below, are incorporated into this endorsement to the extent such terms do not restrict coverage otherwise provided by this endorsement:

<p style="text-align: center;"><b>ADDITIONAL INSURED - OWNERS, LESSEES OR CONTRACTORS (FORM B)</b></p> <p>This endorsement modifies insurance provided under the following:</p> <p style="text-align: center;"><b>COMMERCIAL GENERAL LIABILITY COVERAGE PART. SCHEDULE</b></p> <p>Name of Person or Organization: Blanket Where Required by Written Contract, Agreement, or Certificate of Insurance that the terms of CG 20 10 11 85 apply (If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)</p> <p>WHO IS AN INSURED (Section II) is amended to include as an insured the person or organization shown in the Schedule, but only with respect to liability arising out of "your work" for that insured by or for you.</p> <p style="text-align: center;">Copyright, Insurance Services Office, Inc., 1984</p> <p><b>CG 20 10 11 85</b></p>
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- i. If the written contract, written agreement, or certificate of insurance as outlined above requires additional insured status by use of an Insurance Services Office (ISO) endorsement, then the coverage provided under this CG 70 48 endorsement does not apply. Additional insured status is limited to that provided by the ISO endorsement.

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

## ADVANTAGE COMMERCIAL AUTOMOBILE BROAD FORM ENDORSEMENT

This endorsement modifies insurance provided under the

### BUSINESS AUTO COVERAGE FORM

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by the endorsement.

The premium for this endorsement is \$ INCLUDED

#### 1. EXTENDED CANCELLATION CONDITION

**COMMON POLICY CONDITIONS - CANCELLATION**, Paragraph A.2. is replaced by the following:

2. We may cancel this policy by mailing or delivering to the first Named Insured written notice of cancellation at least:
  - a. 10 days before the effective date of cancellation if we cancel for nonpayment of premium; or
  - b. 60 days before the effective date of cancellation if we cancel for any other reason.

#### 2. BROAD FORM INSURED

**SECTION II - LIABILITY COVERAGE A.1. WHO IS AN INSURED** is amended by the addition of the following:

- d. Any organization you newly acquire or form, other than a partnership, joint venture or limited liability company, and over which you maintain ownership or a majority interest, will qualify as a Named Insured. However,
  - (1) Coverage under this provision is afforded only until the end of the policy period;
  - (2) Coverage does not apply to "accidents" or "loss" that occurred before you acquired or formed the organization; and
  - (3) Coverage does not apply to an organization that is an "insured" under any other policy or would be an "insured" but for its termination or the exhausting of its limit of insurance.
- e. Any "employee" of yours using:
  - (1) A covered "auto" you do not own, hire or borrow, or a covered "auto" not owned by the "employee" or a member of his or her household, while performing duties related to the conduct of your business or your personal affairs; or
  - (2) An "auto" hired or rented under a contract or agreement in that "employee's" name, with your permission, while performing duties related to the conduct of your business. However, your "employee" does not qualify as an Insured under this paragraph (2) while using a covered "auto" rented from you or from any member of the "employee's" household.
- f. Your members, if you are a limited liability company, while using a covered "auto" you do not own, hire, or borrow, while performing duties related to the conduct of your business or your personal affairs.
- g. Any person or organization with whom you agree in a written contract, written agreement or permit, to provide insurance such as is afforded under this policy, but only with respect to your covered "autos".

This provision does not apply:

  - (1) Unless the written contract or agreement is executed or the permit is issued prior to the "bodily injury" or "property damage";

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- (2) To any person or organization included as an insured by an endorsement or in the Declarations; or
- (3) To any lessor of "autos" unless:
  - (a) The lease agreement requires you to provide direct primary insurance for the lessor;
  - (b) The "auto" is leased without a driver; and
  - (c) The lease had not expired.

Leased "autos" covered under this provision will be considered covered "autos" you own and not covered "autos" you hire.

- h. Any legally incorporated organization or subsidiary in which you own more than 50% of the voting stock on the effective date of this endorsement.

This provision does not apply to "bodily injury" or "property damage" for which an "insured" is also an insured under any other automobile policy or would be an insured under such a policy, but for its termination or the exhaustion of its limits of insurance, unless such policy was written to apply specifically in excess of this policy.

### 3. COVERAGE EXTENSIONS - SUPPLEMENTARY PAYMENTS

Under **SECTION II - LIABILITY COVERAGE, A.2.a. Supplementary Payments**, paragraphs (2) and (4) are deleted and replaced with the following:

- (2) Up to \$2500 for the cost of bail bonds (including bonds for related traffic law violations) required because of an "accident" we cover. We do not have to furnish these bonds.
- (4) All reasonable expenses incurred by the "insured" at our request, including actual loss of earnings up to \$500 a day because of time off from work.

### 4. AMENDED FELLOW EMPLOYEE EXCLUSION

**SECTION II - LIABILITY COVERAGE, B. EXCLUSIONS**, paragraph 5. **Fellow Employee** is deleted and replaced by the following:

#### 5. Fellow Employee

"Bodily injury" to:

- a. Any fellow "employee" of the "insured" arising out of and in the course of the fellow "employee's" employment or while performing duties related to the conduct of your business. However, this exclusion does not apply to your "employees" that are officers, managers, supervisors or above. Coverage is excess over any other collectible insurance.
- b. The spouse, child, parent, brother or sister of that fellow "employee" as a consequence of paragraph a. above.

### 5. HIRED AUTO PHYSICAL DAMAGE COVERAGE AND LOSS OF USE EXPENSE

**A. Under SECTION III - PHYSICAL DAMAGE COVERAGE, A. COVERAGE**, the following is added:

If any of your owned covered "autos" are covered for Physical Damage, we will provide Physical Damage coverage to "autos" that you or your "employees" hire or borrow, under your name or the "employee's" name, for the purpose of doing your work. We will provide coverage equal to the broadest physical damage coverage applicable to any covered "auto" shown in the Declarations, Item Three, Schedule of Covered Autos You Own, or on any endorsements amending this schedule.

**B. Under SECTION III - PHYSICAL DAMAGE COVERAGE, A.4. COVERAGE EXTENSIONS**, paragraph **b. Loss of Use Expenses** is deleted and replaced with the following:

#### b. Loss Of Use Expenses

For Hired Auto Physical Damage, we will pay expenses for which an "insured" becomes legally responsible to pay for loss of use of a vehicle rented or hired without a driver, under a written rental contract or agreement. We will pay for loss of use expenses if caused by:

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- (1) Other than collision, only if the Declarations indicate that Comprehensive Coverage is provided for any covered "auto";
- (2) Specified Causes of Loss, only if the Declarations indicate that Specified Causes Of Loss Coverage is provided for any covered "auto"; or
- (3) Collision, only if the Declarations indicate that Collision Coverage is provided for any covered "auto".

However, the most we will pay for any expenses for loss of use is \$30 per day, to a maximum of \$2,000.

C. Under **SECTION IV – BUSINESS AUTO CONDITIONS**, paragraph 5.b. **Other Insurance** is deleted and replaced by the following:

b. For Hired Auto Physical Damage Coverage, the following are deemed to be covered "autos" you own:

- 1. Any covered "auto" you lease, hire, rent or borrow; and
- 2. Any covered "auto" hired or rented by your "employee" under a contract in that individual "employee's" name, with your permission, while performing duties related to the conduct of your business.

However, any "auto" that is leased, hired, rented or borrowed with a driver is not a covered "auto", nor is any "auto" you hire from any of your "employees", partners (if you are a partnership), members (if you are a limited liability company), or members of their households.

#### 6. LOAN OR LEASE GAP COVERAGE

Under **SECTION III - PHYSICAL DAMAGE COVERAGE, A. COVERAGE**, the following is added:

If a covered "auto" is owned or leased and if we provide Physical Damage Coverage on it, we will pay, in the event of a covered total "loss", any unpaid amount due on the lease or loan for a covered "auto", less:

- (a) The amount paid under the Physical Damage Coverage Section of the policy; and
- (b) Any:
  - (1) Overdue lease or loan payments including penalties, interest or other charges resulting from overdue payments at the time of the "loss";
  - (2) Financial penalties imposed under a lease for excessive use, abnormal wear and tear or high mileage;
  - (3) Costs for extended warranties, Credit Life Insurance, Health, Accident or Disability Insurance purchased with the loan or lease;
  - (4) Security deposits not refunded by a lessor; and
  - (5) Carry-over balances from previous loans or leases.

#### 7. RENTAL REIMBURSEMENT

**SECTION III - PHYSICAL DAMAGE COVERAGE, A. COVERAGE**, paragraph 4. **Coverage Extensions** is deleted and replaced by the following:

##### 4. Coverage Extensions

- (a) We will pay up to \$75 per day to a maximum of \$2000 for transportation expense incurred by you because of covered "loss". We will pay only for those covered "autos" for which you carry Collision Coverage or either Comprehensive Coverage or Specified Causes of Loss Coverage. We will pay for transportation expenses incurred during the period beginning 24 hours after the covered "loss" and ending, regardless of the policy's expiration, when the covered "auto" is returned to use or we pay for its "loss". This coverage is in addition to the otherwise applicable coverage you have on a covered "auto". No deductibles apply to this coverage.
- (b) This coverage does not apply while there is a spare or reserve "auto" available to you for your operation.

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## 8. AIRBAG COVERAGE

**SECTION III - PHYSICAL DAMAGE, B. EXCLUSIONS, Paragraph 3.** is deleted and replaced by the following:

We will not pay for "loss" caused by or resulting from any of the following unless caused by other "loss" that is covered by this insurance:

- a. Wear and tear, freezing, mechanical or electrical breakdown. However, this exclusion does not include the discharge of an airbag.
- b. Blowouts, punctures or other road damage to tires.

## 9. GLASS REPAIR - WAIVER OF DEDUCTIBLE

**SECTION III - PHYSICAL DAMAGE COVERAGE, D. DEDUCTIBLE** is amended to add the following:

No deductible applies to glass damage if the glass is repaired rather than replaced.

## 10. COLLISION COVERAGE – WAIVER OF DEDUCTIBLE

**SECTION III - PHYSICAL DAMAGE COVERAGE, D. DEDUCTIBLE** is amended to add the following:

When there is a "loss" to your covered "auto" insured for Collision Coverage, no deductible will apply if the "loss" was caused by a collision with another "auto" insured by us.

## 11. KNOWLEDGE OF ACCIDENT

**SECTION IV - BUSINESS AUTO CONDITIONS, A. LOSS CONDITIONS, 2. DUTIES IN THE EVENT OF ACCIDENT, CLAIM, SUIT OR LOSS,** paragraph a. is deleted and replaced by the following:

- a. You must see to it that we are notified as soon as practicable of an "accident", claim, "suit" or "loss". Knowledge of an "accident", claim, "suit" or "loss" by your "employees" shall not, in itself, constitute knowledge to you unless one of your partners, executive officers, directors, managers, or members (if you are a limited liability company) has knowledge of the "accident", claim, "suit" or "loss". Notice should include:
  - (1) How, when and where the "accident" or "loss" occurred;
  - (2) The "insured's" name and address; and
  - (3) To the extent possible, the names and addresses of any injured persons and witnesses.

## 12. TRANSFER OF RIGHTS (BLANKET WAIVER OF SUBROGATION)

**SECTION IV - BUSINESS AUTO CONDITIONS A.5. TRANSFER OF RIGHTS OF RECOVERY AGAINST OTHERS TO US** is deleted and replaced by the following:

If any person or organization to or for whom we make payment under this Coverage Form has rights to recover damages from another, those rights are transferred to us. That person or organization must do everything necessary to secure our rights and must do nothing after "accident" or "loss" to impair them. However, if the insured has waived rights to recover through a written contract, or if your work was commenced under a letter of intent or work order, subject to a subsequent reduction in writing with customers whose customary contracts require a waiver, we waive any right of recovery we may have under this Coverage Form.

## 13. UNINTENTIONAL FAILURE TO DISCLOSE HAZARDS

**SECTION IV - BUSINESS AUTO CONDITIONS, B. GENERAL CONDITIONS, 2. CONCEALMENT, MISREPRESENTATION OR FRAUD** is amended by the addition of the following:

We will not deny coverage under this Coverage Form if you unintentionally fail to disclose all hazards existing as of the inception date of this policy. You must report to us any knowledge of an error or omission in your representations as soon as practicable after its discovery. This provision does not affect our right to collect additional premium or exercise our right of cancellation or non-renewal.

#### **14. BLANKET COVERAGE FOR CERTAIN OPERATIONS IN CONNECTION WITH RAILROADS**

When required by written contract or written agreement, the definition of "insured contract" is amended as follows:

~~—~~ The exception contained in paragraph **H.3.** relating to construction or demolition operations on or within 50 feet of a railroad; and

~~—~~ Paragraph **H.a.**

are deleted with respect to the use of a covered "auto" in operations for, or affecting, a railroad.

**THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.  
POLICY CHANGES**

POLICY CHANGE NUMBER: 4

POLICY NUMBER	POLICY CHANGES EFFECTIVE	COMPANY	
ACCOUNT NUMBER	POLICY PERIOD	GROUP NAME	GROUP NUMBER
NAMED INSURED		AUTHORIZED REPRESENTATIVE	
COVERAGE PARTS AFFECTED GL			
CHANGES			
<input type="checkbox"/>	Insured's Name	<input type="checkbox"/>	Insured's Mailing Address
<input type="checkbox"/>	Policy Number	<input type="checkbox"/>	Company
<input type="checkbox"/>	Effective/Expiration Date	<input type="checkbox"/>	Insured's Legal Status/Business of Insured
<input type="checkbox"/>	Payment Plan	<input type="checkbox"/>	Premium Determination
<input type="checkbox"/>	Additional Interested Parties	<input type="checkbox"/>	Coverage Forms and Endorsements
<input type="checkbox"/>	Limits/Exposures	<input type="checkbox"/>	Deductibles
<input type="checkbox"/>	Covered Property/Location Description	<input type="checkbox"/>	Classification/Class Codes
<input type="checkbox"/>	Rates	<input type="checkbox"/>	Underlying Insurance

**DESCRIPTION OF CHANGE:**

ADDING A 30 DAY NOTICE OF CANCELLATION IN FAVOR OF THE CITY OF ANN ARBOR MICHIGAN

**THE ABOVE AMENDMENTS RESULT IN A CHANGE IN THE PREMIUM AS FOLLOWS:**

<input checked="" type="checkbox"/> NO CHANGES	<input type="checkbox"/> TO BE ADJUSTED AT AUDIT	ADDITIONAL PREMIUM	RETURN PREMIUM
This endorsement reflects a net premium change Total Policy Premium: Taxes and Surcharges: Balance to Minimum:			

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

IL 70 44 07 08

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12/07/2015

**THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.**

**NOTICE OF CANCELLATION, NONRENEWAL OR MATERIAL  
CHANGE - THIRD PARTY**

This endorsement modifies insurance provided under the following:

AUTO DEALERS COVERAGE FORM  
BUSINESS AUTO COVERAGE FORM  
BUSINESS AUTO PHYSICAL DAMAGE COVERAGE FORM  
COMMERCIAL GENERAL LIABILITY COVERAGE FORM  
COMMERCIAL UMBRELLA LIABILITY COVERAGE FORM  
GARAGE COVERAGE FORM  
MOTOR CARRIER COVERAGE FORM  
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE FORM  
TRUCKERS COVERAGE FORM

Subject to the cancellation provisions of the Coverage Form to which this endorsement is attached, we will not:

1. Cancel;
2. Nonrenew; or
3. Materially change (reduce or restrict)

this Coverage Form until we provide at least 30 days written notice of such cancellation, nonrenewal or material change. Written notice will be to the person or organization named in the Schedule. Such notice will be by certified mail with return receipt requested.

**This notification of cancellation, nonrenewal or material change to the person or organization named in the Schedule is intended as a courtesy only.** Our failure to provide such notification will not:

1. Extend any Coverage Form cancellation date;
2. Negate the cancellation as to any insured or any certificate holder;
3. Provide any additional insurance that would not have been provided in the absence of this endorsement;  
or
4. Impose liability of any kind upon us.

This endorsement does not entitle the person or organization named in the Schedule to any benefits, rights or protection under this Coverage Form.

**SCHEDULE**

**Name Of Person Or Organization**

CITY OF ANN ARBOR MICHIGAN

**Mailing Address**

301 EAST HURON STREET  
ANN ARBOR, MI 48104

## Forms and Endorsements Schedule

Policy Number:  
Named Insured:

Effective Date:

Form Number  
COMMON FORMS

Description

IL 70 68 07 14

NOTICE OF CANCELLATION, NONRENEWAL OR MATERIAL CHANGE - THIRD PARTY