

CITY OF ANN ARBOR
INVITATION TO BID



Barton Dam Hydroturbine: 10-Year Inspection and Overhaul

ITB No. 4467

Due Date: Tuesday, January 24, 2017 at 10:00 AM (Local Time)

Public Services Area/Water Treatment Services Unit
Administering Service Area/Unit

Issued By:

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

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City of Ann Arbor Living Wage Forms
City of Ann Arbor Vendor Conflict of Interest Disclosure Form
City of Ann Arbor Non-Discrimination Ordinance Notice and Declaration Form

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DRAWINGS

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APPENDIX

Appendix A – Insurance and Endorsement Template

Appendix B - Final Inspection Report: Barton Hydro Dam – Phase 1 Wet Inspection (Dated: November 30, 2016)

NOTICE OF PRE-BID CONFERENCE

A pre-bid conference for this project will be held on **Thursday, January 5, 2017 at 10:00 AM** at the Ann Arbor Water Treatment Plant (919 Sunset Road, Ann Arbor, MI 48103). Following the meeting there will be a tour of the Barton Hydro Plant.

Attendance at this conference is highly recommended. Administrative and technical questions regarding this project will be answered at that time. The pre-bid conference is for information only. Any answers furnished will not be official until verified in writing by the Financial Service Area, Procurement Unit. Answers that change or substantially clarify the bid will be affirmed in an addendum.

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 the "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 **Friday, January 13, 2017 at 5:00 PM** and should be addressed as follows:

Specification/Scope of Work questions emailed to: **paul.malocha@stantec.com**
Bid Process and Compliance questions emailed to: **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 **Paul Malocha, P.E.**, at **paul.malocha@stantec.com** after discovery as soon 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 and/or City of Ann Arbor web site 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 **Tuesday, January 24, 2017 at 10:00 AM**. 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 **3 (three)** Bid copies in a sealed envelope clearly marked: **ITB No. 4467 – Barton Dam Hydroturbine: 10-Year Inspection and Overhaul**.

Bids must be addressed and delivered to:

City of Ann Arbor
Procurement Unit,
c/o Customer Services, 1st Floor
301 East Huron Street
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 Prevailing Wage Declaration of Compliance**
- **City of Ann Arbor Living Wage Ordinance Declaration of Compliance**
- **Vendor Conflict of Interest Disclosure Form**
- **City of Ann Arbor Non-Discrimination Ordinance Declaration of Compliance**

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.

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.

Qualifications

The City will evaluate Bids based on cost as well as experience. Contractors that have not included the required list of similar work experience, resumes for project manager and superintendent, and associated references in Section 5 of the Bid Form may have their bid rejected.

As part of the bid, Bidders shall provide documentation that the Bidder's company has at least 10 years of experience providing hydroelectric turbine rebuilding. Bidders shall also submit, for the proposed Project Manager and Superintendent, resumes documenting 7 years of professional experience for each individual in the construction industry as a full-time employee, along with 3 references for each individual from previous projects completed within the past 5 years. Bidders shall also submit the attached form, "Section 5 – References," which identifies a minimum of three projects completed in the past 5 years on hydroelectric turbines, including construction cost, contractor and subcontractor information, that demonstrate similar work experience and complexity to that included within these contract documents specifically inspection, rebuilding, balancing, testing, etc. of kaplan style hydroelectric turbines.

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 and obtain an official Bid. Bidders do not need to be shown on the plan holders list provided by MITN to be considered an official plan holder.

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.

Withdrawal of Bids

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

Contract Time

Time is of the essence in the performance of the work under this Contract. The available time for work under this Contract is indicated on page C-2, Article III of the Contract. If these time requirements cannot be met, the Bidder must stipulate on Bid Form Section 3 - Time Alternate its schedule for performance of the work. Consideration will be given to time in evaluating bids.

Liquidated Damages

A liquidated damages clause, as given on page C-2, Article III of the Contract, provides that the Contractor shall pay the City as liquidated damages, and not as a penalty, a sum certain per day for each and every day that the Contractor may be in default of completion of the specified work, within the time(s) stated in the Contract, or written extensions.

Liquidated damages clauses, as given in the General Conditions, provide further that the City shall be entitled to impose and recover liquidated damages for breach of the obligations under Chapter 112 of the City Code.

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.

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 as outlined in Section 5, beginning at page GC-3 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.

Wage Requirements

Section 4, beginning at page GC-2, outlines the requirements for payment of prevailing wages and for payment of a "living wage" to employees providing service to the City under this contract. The successful bidder and its subcontractors must comply with all applicable requirements and provide documentary proof of compliance when requested.

For laborers whose wage level are subject to federal, state and/or local prevailing wage law the appropriate Davis-Bacon wage rate classification is identified based upon the work including within this contract. **The wage determination(s) current on the date 10 days before bids are due shall apply to this contract.** The U.S. Department of Labor (DOL) has provided explanations to assist with classification in the following resource link: www.wdol.gov

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 be

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.

Major Subcontractors

The Bidder shall identify on Bid Form Section 4 each major subcontractor it expects to engage for this Contract if the work to be subcontracted is 15% or more of the bid sum or over \$50,000, whichever is less. The Bidder also shall identify the work to be subcontracted to each major subcontractor. The Bidder shall not change or replace a subcontractor without approval by the City.

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 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.

SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

Bidders shall submit with their Bid, responses to the following. Responses shall be prepared to numerically match the itemized list as follows:

1. Bidder shall submit a formal/written safety program.
2. Bidder shall describe the job site safety program for this project and specific safety policies in which employees must be in compliance.
3. Bidder shall provide the organizations most current OSHA 300 logs or reasons why this organization is exempt from OSHA 300 reporting.
4. Bidder shall provide the organization's more recent OSHA recordable incident rate, DART rate, and lost workday rate.
5. Bidder shall identify any accidents or incidents that resulted in major injury or deaths that have occurred on a project site controlled by the firm, or any subcontractor(s). If such an incident has occurred, describe how the organization revised the program.
6. Bidders shall identify the project safety team, their qualifications, duties and city(s) of residence.

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 and Declaration of Compliance Form, Living Wage requirements and Declaration of Compliance Form, Prevailing Wage requirements and Declaration of Compliance Form, Vendor Conflict of Interest Form, Notice of Pre-Bid Conference, Instructions to Bidders, Bid, Bid Forms, Contract, Bond Forms, General Conditions, Standard Specifications, Detailed Specifications, all Addenda, and the Plans (if applicable) and understands them. The Bidder declares that it conducted a full investigation at the site and 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 also declares that it has extensive experience in successfully completing projects similar to this one.

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 shown on the plans or described in the bid documents, including any addenda issued, and to furnish all necessary machinery, tools, apparatus, and other means of construction 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.

The Bidder declares that it has become fully familiar with the liquidated damage clauses for completion times and for compliance with City Code Chapter 112, understands and agrees that the liquidated damages are for the non-quantifiable aspects of non-compliance and do not cover actual damages that may be shown and agrees that if awarded the Contract, all liquidated damage clauses form part of the Contract.

The Bidder declares that it has become fully familiar with the provisions of Chapter 14, Section 1:320 (Prevailing wages) and Chapter 23 (Living Wage) of the Code of the City of Ann Arbor and that it understands and agrees to comply, to the extent applicable to employees providing services to the City under this Contract, with the wage and reporting requirements stated in the City Code provisions cited. Bidder certifies that the statements contained in the City Prevailing Wage and Living Wage Declaration of Compliance Forms are true and correct. 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.

The Bidder encloses a certified check or Bid Bond in the amount of 5% of the total of the Bid Price. The Bidder agrees both to contract for the work and to furnish the necessary Bonds and insurance documentation within 10 days after being notified of the acceptance of the Bid.

If this Bid is accepted by the City and the Bidder fails to contract and furnish the required Bonds and insurance documentation within 10 days after being notified of the acceptance of this Bid, then the Bidder shall be considered to have abandoned the Contract and the certified check or Bid Bond accompanying this Bid shall become due and payable to the City.

If the Bidder enters into the Contract in accordance with this Bid, or if this Bid is rejected, then the accompanying check or Bid Bond shall be returned to the Bidder.

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.

SIGNED THIS _____ DAY OF _____, 201_.

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):

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

Authorized Official

_____ **Date** _____, 201_

(Print) Name _____ Title _____

Company: _____

Address: _____

Contact Phone () _____ Fax () _____

Email _____

BID FORM

Section 1 – Schedule of Prices

Bidder's name: _____

Project: **Barton Dam Hydroturbine: 10-Year Inspection and Overhaul, ITB # 4467**

Notes:

1. All bidders shall provide a Unit Price and Total Price for all bid items specified.
2. Quantities included in the bid tables 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 a base bid and alternate bid in any manner the City believes to be in its best interest.

Unit Price Bid

The bidder agrees to complete the Project and all related work, as shown on the drawings and specified, for the following unit prices.

BASE BID ITEMS					
Item No.	Item Description	Qty	Unit	Unit Price	Total Price
1	General Conditions, Insurance, Bonds, Mobilization Max. 5% of Bid	1	LS	\$	\$
2	Equipment Inspections	1	LS	\$	\$
3	Mechanical Repairs and Replacements				
3a	Generator	1	LS	\$	\$
3b	Speed Increaser	1	LS	\$	\$
3c	Runner Bearing	1	LS	\$	\$
3d	Lower Seal	1	LS	\$	\$
3e	Wicket Gate Actuator	1	LS	\$	\$
4	Wicket Blades	4	EA	\$	\$
5	Wicket Housing Lift Lugs	4	EA	\$	\$
6	Painting	1	LS	\$	\$
7	Startup, testing, commissioning	1	LS	\$	\$

8	Demobilization	1	LS	\$	\$
9	Allowance	1	LS	\$ 50,000	\$ 50,000
TOTAL BASE BID					\$

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.)

BID ALTERNATES					
1	Concrete Repairs	1	LS	\$	\$
2	Additional Mechanical Repairs				
2a	Runner servo	1	LS	\$	\$
2b	Runner rebuild	1	LS	\$	\$
2c	Wicket rebuild	1	LS	\$	\$
TOTAL ALTERNATE BID					\$

Total Alternate Bid: _____ Dollars (\$_____)

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

BID FORM

Section 2 - Material and Equipment Alternates

The Base Bid proposal price shall include materials and equipment selected from the designated items and manufacturers listed in the bidding documents. This is done to establish uniformity in bidding and to establish standards of quality for the items named.

If the Contractor wishes to quote alternate items for consideration by the City, it may do so under this Section. A complete description of the item and the proposed price differential must be provided. Unless approved at the time of award, substitutions where items are specifically named will be considered only as a negotiated change in Contract Sum.

<u>Item Number</u>	<u>Description</u>	<u>Add/Deduct Amount</u>
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If the Bidder does not suggest any material or equipment alternate, the Bidder **MUST** complete the following statement:

For the work outlined in this request for bid, the bidder does NOT propose any material or equipment alternate under the Contract.

Signature of Authorized Representative of Bidder _____ Date _____

BID FORM

Section 3 - Time Alternate

If the Bidder takes exception to the time stipulated in Article III of the Contract, Time of Completion, page C-2, it is requested to stipulate below its proposed time for performance of the work. Consideration will be given to time in evaluating bids.

If the Bidder does not suggest any time alternate, the Bidder **MUST** complete the following statement:

For the work outlined in this request for bid, the bidder does NOT propose any time alternate under the Contract.

Signature of Authorized Representative of Bidder _____ Date _____

BID FORM

Section 4 - Major Subcontractors

For purposes of this Contract, a Subcontractor is anyone (other than the Contractor) who performs work (other than or in addition to the furnishing of materials, plans or equipment) at or about the construction site, directly or indirectly for or on behalf of the Contractor (and whether or not in privity of Contract with the Contractor), but shall not include any individual who furnishes merely the individual's own personal labor or services.

Contractor agrees that all subcontracts entered into by the Contractor shall contain similar wage provision to Section 4 of the General Conditions covering subcontractor's employees who perform work on this contract.

For the work outlined in these documents the Bidder expects to engage the following major subcontractors to perform the work identified:

<u>Subcontractor (Name and Address)</u>	<u>Work</u>	<u>Amount</u>
Generator Inspection / Refurbishing		
Gearbox Inspection / Refurbishing		
Painting		
Concrete Repairs		
Electrical Testing – UIS		
Electrician		

If the Bidder does not expect to engage any major subcontractor, the Bidder **MUST** complete the following statement:

For the work outlined in this request for bid, the bidder does NOT expect to engage any major subcontractor to perform work under the Contract.

Signature of Authorized Representative of Bidder _____ Date _____

SAMPLE STANDARD CONTRACT

If a contract is awarded, the selected contractor 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 of service to the City of Ann Arbor such as the following:

CONTRACT

THIS AGREEMENT is made on the _____ day of _____, 2017, between the CITY OF ANN ARBOR, a Michigan Municipal Corporation, 301 East Huron Street, Ann Arbor, Michigan 48104 ("City") and _____ ("Contractor")

(An individual/partnership/corporation, include state of incorporation)

(Address)

Based upon the mutual promises below, the Contractor and the City agree as follows:

ARTICLE I - Scope of Work

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 titled Barton Dam Hydroturbine: 10-Year Inspection and Overhaul ITB No. 4467 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:

Non-discrimination and Living Wage
Declaration of Compliance Forms (if
applicable)
Vendor Conflict of Interest Form
Prevailing Wage Declaration of
Compliance Form (if applicable)
Bid Forms
Contract and Exhibits
Bonds

General Conditions
Standard Specifications
Detailed Specifications
Plans
Addenda

ARTICLE II - Definitions

Administering Service Area/Unit means: **Public Services Area / Water Treatment Services Unit**

Project means **ITB No. 4467 – Barton Dam Hydroturbine: 10-Year Inspection and Overhaul**

ARTICLE III - 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 completed within 28 weeks. After taking the hydroturbine out of service, turbine shall be recommissioned within 18 weeks.
- (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.

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.

ARTICLE IV - The Contract Sum

- (A) The City shall pay to the Contractor for the performance of the Contract, the unit prices as given in the Bid Form for the estimated bid total of:

_____ Dollars (\$_____)

- (B) The amount paid shall be equitably adjusted to cover changes in the work ordered by the Supervising Professional but not required by the Contract Documents. Increases or decreases shall be determined only by written agreement between the City and Contractor.

ARTICLE V - Assignment

This Contract may not be assigned or subcontracted any portion of any right or obligation under this contract without the written consent of the City. Notwithstanding any consent by the City to any assignment, Contractor shall at all times remain bound to all warranties, certifications, indemnifications, promises and performances, however described, as are required of it under this contract unless specifically released from the requirement, in writing, by the City.

ARTICLE VI - Choice of Law

This Contract 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 Contract. The parties stipulate that the venue referenced in this Contract is for convenience and waive any claim of non-convenience.

Whenever possible, each provision of the Contract will be interpreted in a manner as to be effective and valid under applicable law. The prohibition or invalidity, under applicable law, of any provision will not invalidate the remainder of the Contract.

ARTICLE VII - Relationship of the Parties

The parties of the Contract 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 Contract shall be deemed to constitute any other relationship between the City and the Contractor.

Contractor certifies that it has no personal or financial interest in the project other than the compensation it is to receive under the Contract. 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.

ARTICLE VIII - Notice

All notices given under this Contract shall be in writing, and shall be by personal delivery or by certified mail with return receipt requested to the parties at their respective addresses as specified in the Contract Documents or other address the Contractor may specify in writing. Notice will be deemed given on the date when one of the following first occur: (1) the date of actual receipt; or (2) three days after mailing certified U.S. mail.

ARTICLE IX - Indemnification

To the fullest extent permitted by law, 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. The provisions of this Article shall survive the expiration or earlier termination of this contract for any reason.

ARTICLE X - Entire Agreement

This Contract represents the entire understanding between the City and the Contractor and it supersedes all prior representations, negotiations, agreements, or understandings whether written or oral. Neither party has relied on any prior representations in entering into this Contract. No terms or conditions of either party’s invoice, purchase order or other administrative document shall modify the terms and conditions of this Contract, regardless of the other party’s failure to object to such form. This Contract shall be binding on and shall inure to the benefit of the parties to this Contract and their permitted successors and permitted assigns and nothing in this Contract, express or implied, is intended to or shall confer on any other person or entity any legal or equitable right, benefit, or remedy of any nature whatsoever under or by reason of this Contract. This Contract may be altered, amended or modified only by written amendment signed by the City and the Contractor.

FOR CONTRACTOR

By _____

Its: _____

FOR THE CITY OF ANN ARBOR

By _____
Christopher Taylor, Mayor

By _____
Jacqueline Beaudry, City Clerk

Approved as to substance

By _____
Howard S. Lazarus, City Administrator

[signatures continue on next page]

By _____
Craig Hupy, Public Services Area
Administrator

Approved as to form and content

Stephen K. Postema, City Attorney

PERFORMANCE BOND

- (1) _____ of _____ (referred to as "Principal"), and _____, a corporation duly authorized to do business in the State of Michigan (referred to as "Surety"), are bound to the City of Ann Arbor, Michigan (referred to as "City"), for \$ _____, the payment of which Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by this bond.
- (2) The Principal has entered a written Contract with the City dated _____, 201_, for: _____ and this bond is given for that Contract in compliance with Act No. 213 of the Michigan Public Acts of 1963, as amended, being MCL 129.201 et seq.
- (3) Whenever the Principal is declared by the City to be in default under the Contract, the Surety may promptly remedy the default or shall promptly:
- (a) complete the Contract in accordance with its terms and conditions; or
 - (b) obtain a bid or bids for submission to the City for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, arrange for a Contract between such bidder and the City, and make available, as work progresses, sufficient funds to pay the cost of completion less the balance of the Contract price; but not exceeding, including other costs and damages for which Surety may be liable hereunder, the amount set forth in paragraph 1.
- (4) Surety shall have no obligation to the City if the Principal fully and promptly performs under the Contract.
- (5) Surety agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder, or the specifications accompanying it shall in any way affect its obligations on this bond, and waives notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work, or to the specifications.

SIGNED AND SEALED this _____ day of _____, 201_.

(Name of Surety Company)

By _____
(Signature)

Its _____
(Title of Office)

Approved as to form:

Stephen K. Postema, City Attorney

(Name of Principal)

By _____
(Signature)

Its _____
(Title of Office)

Name and address of agent:

LABOR AND MATERIAL BOND

- (1) _____
of _____ (referred to as "Principal"), and _____, a corporation duly authorized to do business in the State of Michigan, (referred to as "Surety"), are bound to the City of Ann Arbor, Michigan (referred to as "City"), for the use and benefit of claimants as defined in Act 213 of Michigan Public Acts of 1963, as amended, being MCL 129.201 et seq., in the amount of \$ _____, for the payment of which Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by this bond.
- (2) The Principal has entered a written Contract with the City, dated _____, 201_, for _____; and this bond is given for that Contract in compliance with Act No. 213 of the Michigan Public Acts of 1963 as amended;
- (3) If the Principal fails to promptly and fully repay claimants for labor and material reasonably required under the Contract, the Surety shall pay those claimants.
- (4) Surety's obligations shall not exceed the amount stated in paragraph 1, and Surety shall have no obligation if the Principal promptly and fully pays the claimants.

SIGNED AND SEALED this _____ day of _____, 201_

(Name of Surety Company)
By _____
(Signature)
Its _____
(Title of Office)

(Name of Principal)
By _____
(Signature)
Its _____
(Title of Office)

Approved as to form:

Stephen K. Postema, City Attorney

Name and address of agent:

GENERAL CONDITIONS

Section 1 - Execution, Correlation and Intent of Documents

The contract documents shall be signed in 2 copies by the City and the Contractor.

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 work. Materials or work described in words which 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 below in any requirement(s), the requirement(s) of the document listed first shall prevail over any conflicting requirement(s) of a document listed later.

(1) Addenda in reverse chronological order; (2) Detailed Specifications; (3) Standard Specifications; (4) Plans; (5) General Conditions; (6) Contract; (7) Bid Forms; (8) Bond Forms; (9) Bid.

Section 2 - Order of Completion

The Contractor shall submit with each invoice, and at other times reasonably requested by the Supervising Professional, schedules showing the order in which the Contractor proposes to carry on the work. They shall include the dates at which the Contractor will start the several parts of the work, the estimated dates of completion of the several parts, and important milestones within the several parts.

Section 3 - Familiarity with Work

The Bidder or its representative shall make personal investigations of the site of the work and of existing structures and shall determine to its own satisfaction the conditions to be encountered, the nature of the ground, the difficulties involved, and all other factors affecting the work proposed under this Contract. The Bidder to whom this Contract is awarded will not be entitled to any additional compensation unless conditions are clearly different from those which could reasonably have been anticipated by a person making diligent and thorough investigation of the site.

The Bidder shall immediately notify the City upon discovery, and in every case prior to submitting its Bid, of every error or omission in the bidding documents that would be identified by a reasonably competent, diligent Bidder. In no case will a Bidder be allowed the benefit of extra compensation or time to complete the work under this Contract for extra expenses or time spent as a result of the error or omission.

Section 4 - Wage Requirements

Under this Contract, the Contractor shall conform to Chapter 14 of Title I of the Code of the City of Ann Arbor as amended; which in part states "...that all craftsmen, mechanics and laborers employed directly on the site in connection with said improvements, including said employees of subcontractors, shall receive the prevailing wage for the corresponding classes of craftsmen,

mechanics and laborers, as determined by statistics for the Ann Arbor area compiled by the United States Department of Labor. At the request of the City, any contractor or subcontractor shall provide satisfactory proof of compliance with the contract provisions required by the Section."

Where the Contract and the Ann Arbor City Ordinance are silent as to definitions of terms required in determining contract compliance with regard to prevailing wages, the definitions provided in the Davis-Bacon Act as amended (40 U.S.C. 278-a to 276-a-7) for the terms shall be used.

If the Contractor is a "covered employer" as defined in Chapter 23 of the Ann Arbor City Code, the Contractor agrees to comply with the living wage provisions of Chapter 23 of the Ann Arbor City Code. The Contractor agrees to pay those employees providing Services to the City under this Agreement a "living wage," as defined in Section 1:815 of the Ann Arbor City Code, as adjusted in accordance with Section 1:815(3); to post a notice approved by the City of the applicability of Chapter 23 in every location in which regular or contract employees providing services under this Agreement are working; to maintain records of compliance; if requested by the City, to provide documentation to verify compliance; to take no action that would reduce the compensation, wages, fringe benefits, or leave available to any employee or person contracted for employment in order to pay the living wage required by Section 1:815; and otherwise to comply with the requirements of Chapter 23.

Contractor agrees that all subcontracts entered into by the Contractor shall contain similar wage provision covering subcontractor's employees who perform work on this contract.

Section 5 - Non-Discrimination

The Contractor agrees to comply, and to require its subcontractor(s) to comply, with the nondiscrimination provisions of MCL 37.2209. The Contractor further agrees to comply with the provisions of Section 9:158 of Chapter 112 of Title IX of the Ann Arbor City Code, and to assure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity.

Section 6 - Materials, Appliances, Employees

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation, and other facilities necessary or used for the execution and completion of the work. Unless otherwise specified, all materials incorporated in the permanent work shall be new, and both workmanship and materials shall be of the highest quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

The Contractor shall at all times enforce strict discipline and good order among its employees, and shall seek to avoid employing on the work any unfit person or anyone not skilled in the work assigned.

Adequate sanitary facilities shall be provided by the Contractor.

Section 7 - Qualifications for Employment

The Contractor shall employ competent laborers and mechanics for the work under this Contract. For work performed under this Contract, employment preference shall be given to qualified local residents.

Section 8 - Royalties and Patents

The Contractor shall pay all royalties and license fees. It shall defend all suits or claims for infringements of any patent rights and shall hold the City harmless from loss on account of infringement except that the City shall be responsible for all infringement loss when a particular process or the product of a particular manufacturer or manufacturers is specified, unless the City has notified the Contractor prior to the signing of the Contract that the particular process or product is patented or is believed to be patented.

Section 9 - Permits and Regulations

The Contractor must secure and pay for all permits, permit or plan review fees and licenses necessary for the prosecution of the work. These include but are not limited to City building permits, right-of-way permits, lane closure permits, right-of-way occupancy permits, and the like. The City shall secure and pay for easements shown on the plans unless otherwise specified.

The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the contract documents are at variance with those requirements, it shall promptly notify the Supervising Professional in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in the work.

Section 10 - Protection of the Public and of Work and Property

The Contractor is responsible for the means, methods, sequences, techniques and procedures of construction and safety programs associated with the work contemplated by this contract. The Contractor, its agents or sub-contractors, shall comply with the "General Rules and Regulations for the Construction Industry" as published by the Construction Safety Commission of the State of Michigan and to all other local, State and National laws, ordinances, rules and regulations pertaining to safety of persons and property.

The Contractor shall take all necessary and reasonable precautions to protect the safety of the public. It shall continuously maintain adequate protection of all work from damage, and shall take all necessary and reasonable precautions to adequately protect all public and private property from injury or loss arising in connection with this Contract. It shall make good any damage, injury or loss to its work and to public and private property resulting from lack of reasonable protective precautions, except as may be due to errors in the contract documents, or caused by agents or employees of the City. The Contractor shall obtain and maintain sufficient insurance to cover damage to any City property at the site by any cause.

In an emergency affecting the safety of life, or the work, or of adjoining property, the Contractor is, without special instructions or authorization from the Supervising Professional, permitted to act at its discretion to prevent the threatened loss or injury. It shall also so act, without appeal, if authorized or instructed by the Supervising Professional.

Any compensation claimed by the Contractor for emergency work shall be determined by agreement or in accordance with the terms of Claims for Extra Cost - Section 15.

Section 11 - Inspection of Work

The City shall provide sufficient competent personnel for the inspection of the work.

The Supervising Professional shall at all times have access to the work whenever it is in preparation or progress, and the Contractor shall provide proper facilities for access and for inspection.

If the specifications, the Supervising Professional's instructions, laws, ordinances, or any public authority require any work to be specially tested or approved, the Contractor shall give the Supervising Professional timely notice of its readiness for inspection, and if the inspection is by an authority other than the Supervising Professional, of the date fixed for the inspection. Inspections by the Supervising Professional shall be made promptly, and where practicable at the source of supply. If any work should be covered up without approval or consent of the Supervising Professional, it must, if required by the Supervising Professional, be uncovered for examination and properly restored at the Contractor's expense.

Re-examination of any work may be ordered by the Supervising Professional, and, if so ordered, the work must be uncovered by the Contractor. If the work is found to be in accordance with the contract documents, the City shall pay the cost of re-examination and replacement. If the work is not in accordance with the contract documents, the Contractor shall pay the cost.

Section 12 - Superintendence

The Contractor shall keep on the work site, during its progress, a competent superintendent and any necessary assistants, all satisfactory to the Supervising Professional. The superintendent will be responsible to perform all on-site project management for the Contractor. The superintendent shall be experienced in the work required for this Contract. The superintendent shall represent the Contractor and all direction given to the superintendent shall be binding as if given to the Contractor. Important directions shall immediately be confirmed in writing to the Contractor. Other directions will be confirmed on written request. The Contractor shall give efficient superintendence to the work, using its best skill and attention.

Section 13 - Changes in the Work

The City may make changes to the quantities of work within the general scope of the Contract at any time by a written order and without notice to the sureties. If the changes add to or deduct from the extent of the work, the Contract Sum shall be adjusted accordingly. All the changes shall be executed under the conditions of the original Contract except that any claim for extension of time caused by the change shall be adjusted at the time of ordering the change.

In giving instructions, the Supervising Professional shall have authority to make minor changes in the work not involving extra cost and not inconsistent with the purposes of the work, but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written order by the Supervising Professional, and no claim for an addition to the Contract Sum shall be valid unless the additional work was ordered in writing.

The Contractor shall proceed with the work as changed and the value of the work shall be determined as provided in Claims for Extra Cost - Section 15.

Section 14 - Extension of Time

Extension of time stipulated in the Contract for completion of the work will be made if and as the Supervising Professional may deem proper under any of the following circumstances:

- (1) When work under an extra work order is added to the work under this Contract;

- (2) When the work is suspended as provided in Section 20;
- (3) When the work of the Contractor is delayed on account of conditions which could not have been foreseen, or which were beyond the control of the Contractor, and which were not the result of its fault or negligence;
- (4) Delays in the progress of the work caused by any act or neglect of the City or of its employees or by other Contractors employed by the City;
- (5) Delay due to an act of Government;
- (6) Delay by the Supervising Professional in the furnishing of plans and necessary information;
- (7) Other cause which in the opinion of the Supervising Professional entitles the Contractor to an extension of time.

The Contractor shall notify the Supervising Professional within 7 days of an occurrence or conditions which, in the Contractor's opinion, entitle it to an extension of time. The notice shall be in writing and submitted in ample time to permit full investigation and evaluation of the Contractor's claim. The Supervising Professional shall acknowledge receipt of the Contractor's notice within 7 days of its receipt. Failure to timely provide the written notice shall constitute a waiver by the Contractor of any claim.

In situations where an extension of time in contract completion is appropriate under this or any other section of the contract, the Contractor understands and agrees that the only available adjustment for events that cause any delays in contract completion shall be extension of the required time for contract completion and that there shall be no adjustments in the money due the Contractor on account of the delay.

Section 15 - Claims for Extra Cost

If the Contractor claims that any instructions by drawings or other media issued after the date of the Contract involved extra cost under this Contract, it shall give the Supervising Professional written notice within 7 days after the receipt of the instructions, and in any event before proceeding to execute the work, except in emergency endangering life or property. The procedure shall then be as provided for Changes in the Work-Section I3. No claim shall be valid unless so made.

If the Supervising Professional orders, in writing, the performance of any work not covered by the contract documents, and for which no item of work is provided in the Contract, and for which no unit price or lump sum basis can be agreed upon, then the extra work shall be done on a Cost-Plus-Percentage basis of payment as follows:

- (1) The Contractor shall be reimbursed for all reasonable costs incurred in doing the work, and shall receive an additional payment of 15% of all the reasonable costs to cover both its indirect overhead costs and profit;
- (2) The term "Cost" shall cover all payroll charges for employees and supervision required under the specific order, together with all worker's compensation, Social Security, pension and retirement allowances and social insurance, or other regular payroll charges on same; the cost of all material and supplies required of either temporary or permanent character; rental of all power-driven equipment at agreed upon rates, together with cost of fuel and supply charges for the equipment; and any costs incurred by the Contractor as a direct result of executing the order, if approved by the Supervising Professional;

- (3) If the extra is performed under subcontract, the subcontractor shall be allowed to compute its charges as described above. The Contractor shall be permitted to add an additional charge of 5% percent to that of the subcontractor for the Contractor's supervision and contractual responsibility;
- (4) The quantities and items of work done each day shall be submitted to the Supervising Professional in a satisfactory form on the succeeding day, and shall be approved by the Supervising Professional and the Contractor or adjusted at once;
- (5) Payments of all charges for work under this Section in any one month shall be made along with normal progress payments. Retainage shall be in accordance with Progress Payments-Section 16.

No additional compensation will be provided for additional equipment, materials, personnel, overtime or special charges required to perform the work within the time requirements of the Contract.

When extra work is required and no suitable price for machinery and equipment can be determined in accordance with this Section, the hourly rate paid shall be 1/40 of the basic weekly rate listed in the Rental Rate Blue Book published by Dataquest Incorporated and applicable to the time period the equipment was first used for the extra work. The hourly rate will be deemed to include all costs of operation such as bucket or blade, fuel, maintenance, "regional factors", insurance, taxes, and the like, but not the costs of the operator.

Section 16 - Progress Payments

The Contractor shall submit each month, or at longer intervals, if it so desires, an invoice covering work performed for which it believes payment, under the Contract terms, is due. The submission shall be to the City's Finance Department - Accounting Division. The Supervising Professional will, within 10 days following submission of the invoice, prepare a certificate for payment for the work in an amount to be determined by the Supervising Professional as fairly representing the acceptable work performed during the period covered by the Contractor's invoice. To insure the proper performance of this Contract, the City will retain a percentage of the estimate in accordance with Act 524, Public Acts of 1980. The City will then, following the receipt of the Supervising Professional's Certificate, make payment to the Contractor as soon as feasible, which is anticipated will be within 15 days.

An allowance may be made in progress payments if substantial quantities of permanent material have been delivered to the site but not incorporated in the completed work if the Contractor, in the opinion of the Supervising Professional, is diligently pursuing the work under this Contract. Such materials shall be properly stored and adequately protected. Allowance in the estimate shall be at the invoice price value of the items. Notwithstanding any payment of any allowance, all risk of loss due to vandalism or any damages to the stored materials remains with the Contractor.

In the case of Contracts which include only the Furnishing and Delivering of Equipment, the payments shall be; 60% of the Contract Sum upon the delivery of all equipment to be furnished, or in the case of delivery of a usable portion of the equipment in advance of the total equipment delivery, 60% of the estimated value of the portion of the equipment may be paid upon its delivery in advance of the time of the remainder of the equipment to be furnished; 30% of the Contract Sum upon completion of erection of all equipment furnished, but not later than 60 days after the date of delivery of all of the equipment to be furnished; and payment of the final 10% on final completion of erection, testing and acceptance of all the equipment to be furnished; but not later than 180 days after the date of delivery of all of the equipment to be furnished, unless testing has

been completed and shows the equipment to be unacceptable.

With each invoice for periodic payment, the Contractor shall enclose a Contractor's Declaration - Section 43, and an updated project schedule per Order of Completion - Section 2.

Section 17 - Deductions for Uncorrected Work

If the Supervising Professional decides it is inexpedient to correct work that has been damaged or that was not done in accordance with the Contract, an equitable deduction from the Contract price shall be made.

Section 18 - Correction of Work Before Final Payment

The Contractor shall promptly remove from the premises all materials condemned by the Supervising Professional as failing to meet Contract requirements, whether incorporated in the work or not, and the Contractor shall promptly replace and re-execute the work in accordance with the Contract and without expense to the City and shall bear the expense of making good all work of other contractors destroyed or damaged by the removal or replacement.

If the Contractor does not remove the condemned work and materials within 10 days after written notice, the City may remove them and, if the removed material has value, may store the material at the expense of the Contractor. If the Contractor does not pay the expense of the removal within 10 days thereafter, the City may, upon 10 days written notice, sell the removed materials at auction or private sale and shall pay to the Contractor the net proceeds, after deducting all costs and expenses that should have been borne by the Contractor. If the removed material has no value, the Contractor must pay the City the expenses for disposal within 10 days of invoice for the disposal costs.

The inspection or lack of inspection of any material or work pertaining to this Contract shall not relieve the Contractor of its obligation to fulfill this Contract and defective work shall be made good. Unsuitable materials may be rejected by the Supervising Professional notwithstanding that the work and materials have been previously overlooked by the Supervising Professional and accepted or estimated for payment or paid for. If the work or any part shall be found defective at any time before the final acceptance of the whole work, the Contractor shall forthwith make good the defect in a manner satisfactory to the Supervising Professional. The judgment and the decision of the Supervising Professional as to whether the materials supplied and the work done under this Contract comply with the requirements of the Contract shall be conclusive and final.

Section 19 - Acceptance and Final Payment

Upon receipt of written notice that the work is ready for final inspection and acceptance, the Supervising Professional will promptly make the inspection. When the Supervising Professional finds the work acceptable under the Contract and the Contract fully performed, the Supervising Professional will promptly sign and issue a final certificate stating that the work required by this Contract has been completed and is accepted by the City under the terms and conditions of the Contract. The entire balance found to be due the Contractor, including the retained percentage, shall be paid to the Contractor by the City within 30 days after the date of the final certificate.

Before issuance of final certificates, the Contractor shall file with the City:

- (1) The consent of the surety to payment of the final estimate;
- (2) The Contractor's Affidavit in the form required by Section 44.

In case the Affidavit or consent is not furnished, the City may retain out of any amount due the Contractor, sums sufficient to cover all lienable claims.

The making and acceptance of the final payment shall constitute a waiver of all claims by the City except those arising from:

- (1) unsettled liens;
- (2) faulty work appearing within 12 months after final payment;
- (3) hidden defects in meeting the requirements of the plans and specifications;
- (4) manufacturer's guarantees.

It shall also constitute a waiver of all claims by the Contractor, except those previously made and still unsettled.

Section 20 - Suspension of Work

The City may at any time suspend the work, or any part by giving 5 days' notice to the Contractor in writing. The work shall be resumed by the Contractor within 10 days after the date fixed in the written notice from the City to the Contractor to do so. The City shall reimburse the Contractor for expense incurred by the Contractor in connection with the work under this Contract as a result of the suspension.

If the work, or any part, shall be stopped by the notice in writing, and if the City does not give notice in writing to the Contractor to resume work at a date within 90 days of the date fixed in the written notice to suspend, then the Contractor may abandon that portion of the work suspended and will be entitled to the estimates and payments for all work done on the portions abandoned, if any, plus 10% of the value of the work abandoned, to compensate for loss of overhead, plant expense, and anticipated profit.

Section 21 - Delays and the City's Right to Terminate Contract

If the Contractor refuses or fails to prosecute the work, or any separate part of it, with the diligence required to insure completion, ready for operation, within the allowable number of consecutive calendar days specified plus extensions, or fails to complete the work within the required time, the City may, by written notice to the Contractor, terminate its right to proceed with the work or any part of the work as to which there has been delay. After providing the notice the City may take over the work and prosecute it to completion, by contract or otherwise, and the Contractor and its sureties shall be liable to the City for any excess cost to the City. If the Contractor's right to proceed is terminated, the City may take possession of and utilize in completing the work, any materials, appliances and plant as may be on the site of the work and useful for completing the work. The right of the Contractor to proceed shall not be terminated or the Contractor charged with liquidated damages where an extension of time is granted under Extension of Time - Section 14.

If the Contractor is adjudged a bankrupt, or if it makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of its insolvency, or if it persistently or repeatedly refuses or fails except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or if it fails to make prompt payments to subcontractors or for material or labor, or persistently disregards laws, ordinances or the instructions of the Supervising Professional, or otherwise is guilty of a substantial violation of any provision of the Contract, then the City, upon the certificate of the Supervising Professional that sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the Contractor 3 days written notice, terminate this Contract. The City may then take possession of the premises and of all materials, tools and appliances thereon and without prejudice to any other remedy it

may have, make good the deficiencies or finish the work by whatever method it may deem expedient, and deduct the cost from the payment due the Contractor. The Contractor shall not be entitled to receive any further payment until the work is finished. If the expense of finishing the work, including compensation for additional managerial and administrative services exceeds the unpaid balance of the Contract Sum, the Contractor and its surety are liable to the City for any excess cost incurred. The expense incurred by the City, and the damage incurred through the Contractor's default, shall be certified by the Supervising Professional.

Section 22 - Contractor's Right to Terminate Contract

If the work should be stopped under an order of any court, or other public authority, for a period of 3 months, through no act or fault of the Contractor or of anyone employed by it, then the Contractor may, upon 7 days written notice to the City, terminate this Contract and recover from the City payment for all acceptable work executed plus reasonable profit.

Section 23 - City's Right To Do Work

If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this Contract, the City, 3 days after giving written notice to the Contractor and its surety may, without prejudice to any other remedy the City may have, make good the deficiencies and may deduct the cost from the payment due to the Contractor.

Section 24 - Removal of Equipment and Supplies

In case of termination of this Contract before completion, from any or no cause, the Contractor, if notified to do so by the City, shall promptly remove any part or all of its equipment and supplies from the property of the City, failing which the City shall have the right to remove the equipment and supplies at the expense of the Contractor.

The removed equipment and supplies may be stored by the City and, if all costs of removal and storage are not paid by the Contractor within 10 days of invoicing, the City upon 10 days written notice may sell the equipment and supplies at auction or private sale, and shall pay the Contractor the net proceeds after deducting all costs and expenses that should have been borne by the Contractor and after deducting all amounts claimed due by any lien holder of the equipment or supplies.

Section 25 - Responsibility for Work and Warranties

The Contractor assumes full responsibility for any and all materials and equipment used in the construction of the work and may not make claims against the City for damages to materials and equipment from any cause except negligence or willful act of the City. Until its final acceptance, the Contractor shall be responsible for damage to or destruction of the project (except for any part covered by Partial Completion and Acceptance - Section 26). The Contractor shall make good all work damaged or destroyed before acceptance. All risk of loss remains with the Contractor until final acceptance of the work (Section 19) or partial acceptance (Section 26). The Contractor is advised to investigate obtaining its own builders risk insurance.

The Contractor shall guarantee the quality of the work for a period of one year. The Contractor shall also unconditionally guarantee the quality of all equipment and materials that are furnished and installed under the contract for a period of one year. At the end of one year after the Contractor's receipt of final payment, the complete work, including equipment and materials furnished and installed under the contract, shall be inspected by the Contractor and the Supervising Professional. Any defects shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days. Any defects that are identified prior to the end of

one year shall also be inspected by the Contractor and the Supervising Professional and shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days. The Contractor shall assign all manufacturer or material supplier warranties to the City prior to final payment. The assignment shall not relieve the Contractor of its obligations under this paragraph to correct defects.

Section 26 - Partial Completion and Acceptance

If at any time prior to the issuance of the final certificate referred to in Acceptance and Final Payment - Section 19, any portion of the permanent construction has been satisfactorily completed, and if the Supervising Professional determines that portion of the permanent construction is not required for the operations of the Contractor but is needed by the City, the Supervising Professional shall issue to the Contractor a certificate of partial completion, and immediately the City may take over and use the portion of the permanent construction described in the certificate, and exclude the Contractor from that portion.

The issuance of a certificate of partial completion shall not constitute an extension of the Contractor's time to complete the portion of the permanent construction to which it relates if the Contractor has failed to complete it in accordance with the terms of this Contract. The issuance of the certificate shall not release the Contractor or its sureties from any obligations under this Contract including bonds.

If prior use increases the cost of, or delays the work, the Contractor shall be entitled to extra compensation, or extension of time, or both, as the Supervising Professional may determine.

Section 27 - Payments Withheld Prior to Final Acceptance of Work

The City may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any certificate to the extent reasonably appropriate to protect the City from loss on account of:

- (1) Defective work not remedied;
- (2) Claims filed or reasonable evidence indicating probable filing of claims by other parties against the Contractor;
- (3) Failure of the Contractor to make payments properly to subcontractors or for material or labor;
- (4) Damage to another Contractor.

When the above grounds are removed or the Contractor provides a Surety Bond satisfactory to the City which will protect the City in the amount withheld, payment shall be made for amounts withheld under this section.

Section 28 - Contractor's Insurance

- (1) 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 and the City from all claims for bodily injuries, death or property damage which may arise under this Contract; whether the act(s) or omission(s) giving rise to the claim were made by the Contractor or by any subcontractor or anyone employed by them directly or indirectly. 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, certificates of insurance and other documentation satisfactory to the City demonstrating it has obtained the policies and endorsements required on behalf of itself, and when requested, any subcontractor(s). The certificates of insurance endorsements and/or copies of policy language shall document that the Contractor satisfies the following minimum requirements.

- (a) 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

- (b) Commercial General Liability Insurance equivalent to, as a minimum, Insurance Services Office form CG 00 01 07 98 or current equivalent. The City of Ann Arbor shall be named as an additional insured. There shall be no added exclusions or limiting endorsements specifically for the following coverages: Products and Completed Operations, Explosion, Collapse and Underground coverage or Pollution. Further there shall be no added exclusions or limiting endorsements which diminish the City's protections as an additional insured under the policy. 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

- (c) Motor Vehicle Liability Insurance, including Michigan No-Fault Coverages, equivalent to, as a minimum, Insurance Services Office form CA 00 01 07 97 or current equivalent. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles. The City of Ann Arbor shall be named as an additional insured. There shall be no added exclusions or limiting endorsements which diminish the City's protections as an additional insured under the policy. 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.

- (d) 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.

- (2) Insurance required under subsection (1)(b) and (1)(c) above 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.
- (3) Insurance companies and policy forms are subject to approval of the City Attorney; which approval shall not be unreasonably withheld. 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 Contractor shall furnish the City with satisfactory certificates of insurance and endorsements prior to commencement of any work. 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 and endorsements to the Administering Service Area/Unit at least ten days prior to the expiration date.

- (4) 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.
- (5) City reserves the right to require additional coverage and/or coverage amounts as may be included from time to time in the Detailed Specifications for the Project.
- (6) The provisions of General Condition 28 shall survive the expiration or earlier termination of this contract for any reason.

Section 29 - Surety Bonds

Bonds will be required from the successful bidder as follows:

- (1) A Performance Bond to the City of Ann Arbor for the amount of the bid(s) accepted;
- (2) A Labor and Material Bond to the City of Ann Arbor for the amount of the bid(s) accepted.

Bonds shall be executed on forms supplied by the City in a manner and by a Surety Company authorized to transact business in Michigan and satisfactory to the City Attorney.

Section 30 - Damage Claims

The Contractor shall be held responsible for all damages to property of the City or others, caused by or resulting from the negligence of the Contractor, its employees, or agents during the progress of or connected with the prosecution of the work, whether within the limits of the work or elsewhere. The Contractor must restore all property injured including sidewalks, curbing, sodding, pipes, conduit, sewers or other public or private property to not less than its original condition with new work.

Section 31 - Refusal to Obey Instructions

If the Contractor refuses to obey the instructions of the Supervising Professional, the Supervising Professional shall withdraw inspection from the work, and no payments will be made for work performed thereafter nor may work be performed thereafter until the Supervising Professional shall have again authorized the work to proceed.

Section 32 - Assignment

Neither party to the Contract shall assign the Contract without the written consent of the other. The Contractor may assign any monies due to it to a third party acceptable to the City.

Section 33 - Rights of Various Interests

Whenever work being done by the City's forces or by other contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by the Supervising Professional, to secure the completion of the various portions of the work in general harmony.

The Contractor is responsible to coordinate all aspects of the work, including coordination of, and with, utility companies and other contractors whose work impacts this project.

Section 34 - Subcontracts

The Contractor shall not award any work to any subcontractor without prior written approval of the City. The approval will not be given until the Contractor submits to the City a written statement concerning the proposed award to the subcontractor. The statement shall contain all information the City may require.

The Contractor shall be as fully responsible to the City for the acts and omissions of its subcontractors, and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it.

The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Conditions and all other contract documents applicable to the work of the subcontractors and to give the Contractor the same power to terminate any subcontract that the City may exercise over the Contractor under any provision of the contract documents.

Nothing contained in the contract documents shall create any contractual relation between any subcontractor and the City.

Section 35 - Supervising Professional's Status

The Supervising Professional has the right to inspect any or all work. The Supervising Professional has authority to stop the work whenever stoppage may be appropriate to insure the proper execution of the Contract. The Supervising Professional has the authority to reject all work and materials which do not conform to the Contract and to decide questions which arise in the execution of the work.

The Supervising Professional shall make all measurements and determinations of quantities. Those measurements and determinations are final and conclusive between the parties.

Section 36 - Supervising Professional's Decisions

The Supervising Professional shall, within a reasonable time after their presentation to the Supervising Professional, make decisions in writing on all claims of the City or the Contractor and on all other matters relating to the execution and progress of the work or the interpretation of the contract documents.

Section 37 - Storing Materials and Supplies

Materials and supplies may be stored at the site of the work at locations agreeable to the City

unless specific exception is listed elsewhere in these documents. Ample way for foot traffic and drainage must be provided, and gutters must, at all times, be kept free from obstruction. Traffic on streets shall be interfered with as little as possible. The Contractor may not enter or occupy with agents, employees, tools, or material any private property without first obtaining written permission from its owner. A copy of the permission shall be furnished to the Supervising Professional.

Section 38 - Lands for Work

The Contractor shall provide, at its own expense and without liability to the City, any additional land and access that may be required for temporary construction facilities or for storage of materials.

Section 39 - Cleaning Up

The Contractor shall, as directed by the Supervising Professional, remove at its own expense from the City's property and from all public and private property all temporary structures, rubbish and waste materials resulting from its operations unless otherwise specifically approved, in writing, by the Supervising Professional.

Section 40 - Salvage

The Supervising Professional may designate for salvage any materials from existing structures or underground services. Materials so designated remain City property and shall be transported or stored at a location as the Supervising Professional may direct.

Section 41 - Night, Saturday or Sunday Work

No night or Sunday work (without prior written City approval) will be permitted except in the case of an emergency and then only to the extent absolutely necessary. The City may allow night work which, in the opinion of the Supervising Professional, can be satisfactorily performed at night. Night work is any work between 8:00 p.m. and 7:00 a.m. No Saturday work will be permitted unless the Contractor gives the Supervising Professional at least 48 hours but not more than 5 days' notice of the Contractor's intention to work the upcoming Saturday.

Section 42 - Sales Taxes

Under State law the City is exempt from the assessment of State Sales Tax on its direct purchases. Contractors who acquire materials, equipment, supplies, etc. for incorporation in City projects are not likewise exempt. State Law shall prevail. The Bidder shall familiarize itself with the State Law and prepare its Bid accordingly. No extra payment will be allowed under this Contract for failure of the Contractor to make proper allowance in this bid for taxes it must pay.

Section 43

CONTRACTOR'S DECLARATION

I hereby declare that I have not, during the period _____, 20____, to _____, 20____, performed any work, furnished any materials, sustained any loss, damage or delay, or otherwise done anything in addition to the regular items (or executed change orders) set forth in the Contract titled Barton Dam Hydroturbine: 10-Year Inspection and Overhaul, for which I shall ask, demand, sue for, or claim compensation or extension of time from the City, except as I hereby make claim for additional compensation or extension of time as set forth on the attached itemized statement. I further declare that I have paid all payroll obligations related to this Contract that have become due during the above period and that all invoices related to this Contract received more than 30 days prior to this declaration have been paid in full except as listed below.

There is/is not (Contractor please circle one and strike one as appropriate) an itemized statement attached regarding a request for additional compensation or extension of time.

Contractor

Date

By _____
(Signature)

Its _____
(Title of Office)

Past due invoices, if any, are listed below.

Section 44

CONTRACTOR'S AFFIDAVIT

The undersigned Contractor, _____, represents that on _____, 20____, it was awarded a contract by the City of Ann Arbor, Michigan to _____ under the terms and conditions of a Contract titled Barton Dam Hydroturbine: 10-Year Inspection and Overhaul. The Contractor represents that all work has now been accomplished and the Contract is complete.

The Contractor warrants and certifies that all of its indebtedness arising by reason of the Contract has been fully paid or satisfactorily secured; and that all claims from subcontractors and others for labor and material used in accomplishing the project, as well as all other claims arising from the performance of the Contract, have been fully paid or satisfactorily settled. The Contractor agrees that, if any claim should hereafter arise, it shall assume responsibility for it immediately upon request to do so by the City of Ann Arbor.

The Contractor, for valuable consideration received, does further waive, release and relinquish any and all claims or right of lien which the Contractor now has or may acquire upon the subject premises for labor and material used in the project owned by the City of Ann Arbor.

This affidavit is freely and voluntarily given with full knowledge of the facts.

Contractor

Date

By _____
(Signature)

Its _____
(Title of Office)

Subscribed and sworn to before me, on this _____ day of _____, 20____
_____, _____ County, Michigan

Notary Public

_____ County, MI

My commission expires on:

SUPPLEMENTAL GENERAL CONDITIONS

General Safety Requirements

The Contractor shall be responsible for ensuring compliance with the most stringent provisions of the applicable statutes and regulations of the Michigan Occupational Safety and Health Act 154 of 1974, the Occupational Safety and Health Act of 1970, and all City of Ann Arbor safety policies. The Contractor shall flow down all these requirements to any subcontractors performing work under the contract. Should charges of violation of any of the above be issued to the Contractor in the course of the work, a copy of each charge shall be immediately forwarded to the City along with a plan to correct the violation.

Upon the failure of the Contractor to comply with any of these requirements, the City's Representative shall have the authority to stop any and all operations of the Contractor affected by such failure until such failure is remedied. No part of the time lost due to any such stop orders shall be made subject to a claim or extension of time or increase in compensation.

All materials, equipment, and supplies provided to the City of Ann Arbor must comply fully with all safety requirements as set forth by the Michigan Occupational Safety and Health Act 154 of 1974 and all applicable OSHA Standards.

STANDARD SPECIFICATIONS

All work under this contract shall be performed in accordance with the Public Services Department Standard Specifications in effect at the date of availability of the contract documents stipulated in the Bid. All work under this Contract which is not included in these Standard Specifications, or which is performed using modifications to these Standard Specifications, shall be performed in accordance with the Detailed Specifications included in these contract documents.

Standard Specifications are available online:

<http://www.a2gov.org/departments/engineering/Pages/Engineering-and-Contractor-Resources.aspx>

ATTACHMENTS

**CITY OF ANN ARBOR
LIVING WAGE ORDINANCE**

RATE EFFECTIVE APRIL 30, 2016 - ENDING APRIL 29, 2017

\$12.93 per hour

If the employer provides health care benefits*

\$14.43 per hour

If the employer does **NOT** provide health care benefits*

Employers providing services to or for the City of Ann Arbor or recipients of grants or financial assistance from the City of Ann Arbor for a value of more than \$10,000 in a twelve-month period of time must pay those employees performing work on a City of Ann Arbor contract or grant, the above living wage.

ENFORCEMENT

The City of Ann Arbor may recover back wages either administratively or through court action for the employees that have been underpaid in violation of the law. Persons denied payment of the living wage have the right to bring a civil action for damages in addition to any action taken by the City.

Violation of this Ordinance is punishable by fines of not more than \$500/violation plus costs, with each day being considered a separate violation. Additionally, the City of Ann Arbor has the right to modify, terminate, cancel or suspend a contract in the event of a violation of the Ordinance.

* Health Care benefits include those paid for by the employer or making an employer contribution toward the purchase of health care. The employee contribution must not exceed \$.50 an hour for an average work week; and the employer cost or contribution must equal no less than \$1/hr for the average work week.

The Law Requires Employers to Display This Poster Where Employees Can Readily See It.

**For Additional Information or to File a Complaint Contact:
Colin Spencer at 734/794-6500 or cspencer@a2gov.org**



Vendor Conflict of Interest Disclosure Form
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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 of 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.

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:

Conflict of Interest Disclosure*	
Name of City of Ann Arbor employees, elected officials or immediate family members with whom there may be a potential conflict of interest.	<input type="checkbox"/> Relationship to employee <hr style="border: 0; border-top: 1px solid black;"/> <input type="checkbox"/> Interest in vendor's company <input type="checkbox"/> Other (please describe in box below)

*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 this Conflict of Interest Disclosure has been examined by me and that its contents are true and correct to my knowledge and belief and I have the authority to so certify on behalf of the Vendor by my signature below:		
Vendor Name	Vendor Phone Number	
Signature of Vendor Authorized Representative	Date	Printed Name of Vendor Authorized Representative

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

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 (hrc@a2gov.org), by phone (734-794-6141) 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.

DETAILED SPECIFICATION

SECTION 01000

GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Work under this Contract consists of inspections and repairs to the Barton Hydroturbine and all related work.
- B. As relevant, Contract Drawings are included which give specific locations for work under this Contract. Drawings depict the general form of items for painting.
- C. It is the intent of these Contract Documents that the CONTRACTOR provide a complete and finished product. Items shown on the Drawings and Specifications not specifically connected to a heading in the Bid Form are to be considered as incidental to the work.

1.2 EXISTING FACILITIES ACCESS

- A. Barton Hydro Plant is adjacent to a City park. Accordingly, the CONTRACTOR's operations must allow for safe passage of the public near work areas. The CONTRACTOR be responsible for maintaining safe access for the public to the existing park areas beyond the work zones.
- B. If temporary closures are required, the CONTRACTOR shall place signage and barriers as needed, at the dam, at park entrances and park on Huron River Drive (downstream right shore of river, southwest of railroad bridge). The CONTRACTOR shall provide 24-hour advance written notice before making a closure, and shall not proceed with the closure until permission is granted by the City.
- C. The CONTRACTOR shall secure all operations and stored materials and equipment during construction, and shall prevent unwanted access into the Hydro Plant by keeping doors closed and locked.
- D. Access to the hydro plant shall not be temporarily disrupted without coordination with and prior approval of the OWNER.
- E. The overhead crane in the facility is available for CONTRACTOR use. The CONTRACTOR is required to operate the crane.

1.3 CONSTRUCTION WATER

- A. Water for construction is available from the OWNER and may be obtained from the existing facility; however, the flow rate is low and appropriate only for limited applications.

1.4 CONSTRUCTION POWER

- A. 110V single phase power is available for use. The CONTRACTOR will be responsible for providing all connections.

1.5 WORK SCHEDULE

- A. The CONTRACTOR shall provide a work schedule. The schedule shall be complete and shall show in detail the way he proposes to complete the work under this Contract and approximate monthly billing of the Contract. The purpose of the schedule is to assist the OWNER in notifying the public of inconveniences and to anticipate cash-flow on the job, and to determine if the CONTRACTOR is reasonably proceeding with the work to assure completion within the specified time.
- B. Work hours shall be restricted to Monday through Friday, 7 AM to 8 PM. Work shall not be conducted on City holidays or Sundays. Exceptions to work hour limits (i.e., Saturday work) shall be only by written permission of the OWNER.

1.6 CONSTRUCTION SEQUENCE

- A. The CONTRACTOR shall coordinate and schedule his work with the OWNER.
- B. Prior to commencing the work, the CONTRACTOR shall provide the ENGINEER a detailed schedule of the proposed work. The schedule shall include a list of tasks required to complete the work; their relevancy to each other; expected duration; and completion dates.
- C. The CONTRACTOR is responsible for presenting a sequence with schedule to the OWNER/ENGINEER for review. All proposed improvements shall be constructed only in accordance with an approved schedule.

1.7 DIGITAL PHOTOGRAPHIC RECORD

- A. The CONTRACTOR shall furnish to the OWNER a digital photographic record for all areas where work is undertaken, including parts and components of inspections and repairs. Photographs shall be taken before equipment disassembly and after re-assembly. Parts and components shall be identified with in-photo labels or signs.
- B. The photographs shall be stored on a CD or DVD of such quality to accurately show the existing conditions.
- C. The photographic record shall include date, time, and location at appropriate intervals. The location shall be easily referenced to the Contract Drawings.

1.8 PROJECT PROGRESS MEETING

- A. It shall be the responsibility of the CONTRACTOR to have a representative, including key subcontractors, present at each meeting. The CONTRACTOR shall be available for meetings shall be held at least twice a month as necessary.

1.9 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

- A. GENERAL
 - 1. The method of measurement and the basis of payment for each item in the Proposal will be as specified in the schedule attached. The items are generally grouped by the section of the Specifications under which the particular unit of work is detailed. There will be no payment allowed for any unit of work not specifically mentioned in the Proposal as a bid item, and any such unit of work not mentioned in the Proposal, but necessary for the completion of the Project, will be considered as incidental to

the construction of the Project.

B. MEASUREMENT

1. Quantities of work completed under the Contract will be measured by the ENGINEER according to the United States standard measures. Where measurements are specified to be "in place," they will be taken along the actual surface of the completed item to obtain lineal, area, or volume measurements.

C. PAYMENT

1. In each and every instance in the following Measurement and Payment Schedule, where a Basis of Payment is specified, it shall be understood to be prefaced by the following statement, "**The contract unit price bid in the Proposal will be payment in full for all labor, materials, and equipment necessary to do the following according to the Plans and Specifications.**" Payment shall be made on the basis of the actual quantity of the item completed and accepted at the unit price for such item named in the Proposal.

**BID ITEMS – BASE BID
(ITEMS APPLY SEPARATELY TO EACH LOCATION SPECIFIED IN THE BID FORM)**

<u>ITEM IN PROPOSAL</u>	<u>METHOD OF MEASUREMENT</u>	<u>BASIS OF PAYMENT</u>
General Conditions, Insurance, Bonds Mobilization	By the unit lump sum (LS)	The complete cost of insurance, bonds, and mobilization for the project and other requirements of General Conditions. Includes offices, stored materials and equipment, conveniences, and other temporary facilities, safety requirements, scaffolding, security and whatever means the CONTRACTOR deems necessary for accessing the work; organizing the project; coordination with OWNER, ENGINEER, third parties and sub-contractors; Shop Drawings and other administrative work; bringing equipment to the site as required; management of job; and all related work. Any costs assumed to be above and beyond the value of this pay item shall be incidental to other pay items in the Contract. The maximum amount of this item shall be 5% of the total.
Equipment Inspections	By the unit lump sum (LS)	Perform inspections and document results.

MECHANICAL REPAIRS AND REPLACEMENTS

Generator	By the unit lump sum (LS)	Disconnect, remove and ship unit. Perform specified inspections, repairs, and replacements.
Speed Increaser	By the unit lump sum (LS)	Disconnect, remove and ship unit. Perform specified inspections, repairs, and replacements.
Runner Bearing	By the unit lump sum (LS)	Remove old unit and install new.
Lower Seal	By the unit lump sum (LS)	Remove old unit and install new.
Wicket Gate Actuator	By the unit lump sum (LS)	Perform repairs and replacements. Restart and test unit.
Wicket Blades	By the unit each (EA)	Perform weld repairs.
Wicket Housing Lift Lugs	By the unit each (EA)	Install and test lift lugs.

<u>ITEM IN PROPOSAL</u>	<u>METHOD OF MEASUREMENT</u>	<u>BASIS OF PAYMENT</u>
Startup, Testing, Commissioning	By the unit lump sum (LS)	Complete services as described in Specifications.
Demobilization	By the unit lump sum (LS)	Complete demobilization from jobsite.
Allowance	By the unit lump sum (LS)	Only for items that are pre-approved by the OWNER, which fall outside of the BASE or selected ALTERNATE scope of work.

BID ITEM – ALTERNATES

Concrete Repairs	By the unit lump sum (LS)	Underpinning, demolition, reinforcing, concrete, forming, testing and curing and all related work.
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ADDITIONAL MECH. REPAIRS AND REPLACEMENTS

Runner Servo	By the unit lump sum (LS)	Complete work as specified.
Runner Rebuild	By the unit lump sum (LS)	Complete work as specified.
Wicket Rebuild	By the unit lump sum (LS)	Complete work as specified.

END OF SECTION

SECTION 01010

SUMMARY OF WORK

PART 1 – GENERAL

1.1 SUMMARY OF WORK

- A. Work under this contract consists of inspection and repair to the Barton Hydroturbine. The equipment is a 952 kW Voest-Alpine vertical Kaplan pressure flume turbine. Runner diameter is 1800 mm with 6 blades. Flow is controlled by 16 hydraulic-actuated wicket gates. The rated discharge is 533 cfs @ 23.5 feet of head.

The gear drive is a Philadelphia parallel shaft unit (Type 165VT).

The generator is an Ideal polyphase induction unit, 3 phase, 60 Hz, 2300 Volts (Type AR6V)

- B. All old parts shall be turned back over to the City.
- C. The OWNER will complete the following items as preparation for, or in conjunction with, the work of the CONTRACTOR:
1. Shut-down turbine equipment and rack out load breakers.
 2. Place stoplogs in the headrace and tailrace, and dewater the work spaces. The City requires approximately 2 weeks to place and seal the stoplogs and perform powerwashing. The CONTRACTOR shall account for this time in his schedule. .
 3. Lockout, tagout (LOTO) of equipment. However, the CONTRACTOR will be responsible for adding his own LOTO.
 4. Power wash interior surfaces on the upstream side of the turbine.
 5. Perform bypass of system governor.
 6. Maintain availability during the CONTRACTOR's work to operate switches and valves, identify equipment and components, and answer questions.
 7. Provide selected OWNER-furnished parts:
 - a. Guide bearing (i.e., rubber main bearing)
 - b. Turbine shaft seal (Deep Sea Seal)
 - c. Wicket blade Fibra-glide/Lubron bearings and O-rings (not including spherical bearings).
 - d. Wicket hydraulic actuator cylinder – pivot bearings.
 - e. Runner blade bearings.
 - f. Runner link arm bearings.

- g. Brake rebuild components.
 - h. High speed shaft couplings.
 - 8. Re-water turbine and remove stoplogs.
 - 9. Witness CONTRACTOR's recommissioning of turbine.
 - D. The CONTRACTOR's work includes the following:
 - 1. GENERAL
 - a. Perform wet inspections and vibration testing prior to stoplog installation and dewatering.
 - b. Safety requirements, adhering to OSHA/MIOSHA, including fall protection, gas detection and all other requirements of confined space entry.
 - c. Scaffolds and lighting.
 - d. Sump pumps for control of water that leaks past stoplogs.
 - e. Power-wash remaining surfaces not covered by the OWNER.
 - f. Rigging, lifting, loading and off-loading equipment as required. Overhead crane is available in generator room. The CONTRACTOR shall provide other lift equipment as needed, including for watered areas and loading.
 - g. All parts (either spare parts or those integrated in the work) not called out as OWNER-furnished.
 - h. Security for stored materials and equipment and operations on site.
 - i. Document work daily, in writing and with photographs.
 - j. Document part clearances, torques, part numbers, etc.
 - k. Document and special tools that are required for work.
 - 2. BASE BID
 - a. Equipment Inspections (for additional detail, see Section 15500).
 - i. Watered and operational.
 - 1. Before shut down. This work shall be performed before the City installs the stoplogs. See section C.2 above.
 - 2. After re-start.
 - ii. Shut down and in the dry.

- b. Mechanical Repairs and Replacements (for additional detail, see Section 15500).
- c. Equipment modifications (for additional detail see Drawings).
- d. Painting (for additional information, see Section 09900).
- e. Startup, Testing and Commissioning (for additional detail see Section 15500).

3. BID ALTERNATES

These items will be completed only if selected by the OWNER after receiving the bids.

- a. Concrete repairs (for additional detail see the Drawings).
- b. Additional mechanical repairs (for additional information see Section 15500).

1.2 CONTRACT DOCUMENTS

- A. The Work to be done includes Drawings entitled Barton Dam Hydroturbine: 10-year Inspection and Overhaul. All drawings so enumerated shall be considered an integral part of the Contract Documents as defined herein.
- B. 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.
- C. The prime CONTRACTOR shall be responsible for all work in the Contract Documents regardless of the division of disciplines.

1.3 GENERAL ARRANGEMENT

- A. Drawings indicate the extent and general arrangement of the work. If any departures from the Drawings are deemed necessary by the CONTRACTOR to accommodate the materials and equipment CONTRACTOR proposes to furnish, details of such departures and reasons therefore shall be submitted as soon as practicable to the ENGINEER for approval by OWNER and ENGINEER. No such departures shall be made without the prior written approval of the OWNER or ENGINEER. Approved changes shall be made without additional cost to the OWNER for this work or related work under other Contracts of the Project.
- B. The specific equipment proposed for use by the CONTRACTOR on the project may require changes in structures, auxiliary equipment, piping, electrical, mechanical, controls or other work to provide a complete satisfactory operating installation. The CONTRACTOR shall submit to the ENGINEER, for approval by OWNER and ENGINEER, all necessary Drawings and details showing such changes to verify conformance with the overall project structural and architectural requirements and overall project operating performance. The Bid Price shall include all costs in connection with the preparation of new drawings and details and all changes to construction work to accommodate the proposed equipment, including increases in the costs of other Contracts.

1.4 ADDITIONAL ENGINEERING SERVICES

- A. In the event that the ENGINEER is required to provide additional engineering services as a result of substitution of materials or equipment which are not "or equal" by the CONTRACTOR, or changes by the CONTRACTOR in dimension, weight, power requirements, etc., of the equipment and accessories furnished, or if the ENGINEER is required to examine and evaluate any changes proposed by the CONTRACTOR for the convenience of the CONTRACTOR, then the ENGINEER's charges in connection with such additional services shall be charged to the CONTRACTOR by the OWNER.
- B. In the event, that the ENGINEER is required to provide additional engineering services as a result of CONTRACTOR's errors, omissions, or failure to conform to the requirements of the Contract Documents, or if the ENGINEER is required to examine and evaluate any changes proposed by the CONTRACTOR solely for the convenience of the CONTRACTOR, then the ENGINEER's charges in connection with such additional services shall be charged to the CONTRACTOR by the OWNER.

1.5 ADDITIONAL OWNER'S EXPENSES

- A. In the event the Work of this Contract is not completed within the time set forth in the Contract or within the time to which such completion may have been extended in accordance with the Contract Documents, the additional engineering or inspection charges incurred by the OWNER may be charged to the CONTRACTOR and deducted from the monies due the CONTRACTOR. Extra work or supplemental Contract work added to the original Contract, as well as extenuating circumstances beyond the control of the CONTRACTOR, will be given due consideration by the OWNER before assessing engineering and inspection charges against the CONTRACTOR.
- B. Charges for additional OWNER's expenses shall be in addition to any liquidated damages assessed in accordance with the Contract.

1.6 PROTECTION OF WORK

- A. Unless otherwise specifically permitted, all work that would be subject to damage shall be stopped during inclement, stormy or freezing weather. Only such work as will not suffer injury to workmanship or materials will be permitted. CONTRACTOR shall carefully protect the work against damage or injury from the weather, and when work is permitted during freezing weather, CONTRACTOR shall provide and maintain approved facilities for heating the materials and for protecting the finished work.

1.7 RESIDENT PROJECT REPRESENTATIVES

- A. If the OWNER authorizes the ENGINEER, the ENGINEER shall provide a resident project representative to assist the ENGINEER in carrying out his responsibilities at the site. The resident may not be full-time on-site and the CONTRACTOR shall be responsible for coordination with the ENGINEER. The furnishing of such resident project representatives shall not make the ENGINEER responsible for the CONTRACTOR's construction means, methods, techniques, sequences, or procedures or for any safety precautions or programs in connection with the work. The CONTRACTOR shall remain solely responsible for meeting the requirements of the Contract Documents.

1.8 FIRE PROTECTION

- A. CONTRACTOR shall take all necessary precautions to prevent fires at or adjacent to the work, buildings, etc., and shall provide adequate facilities for extinguishing fires which do occur. Burning of debris is not permitted on the project site.
- B. When fire or explosion hazards are created in the vicinity of the work as a result of the locations of fuel tanks, or similar hazardous utilities or devices, the CONTRACTOR shall immediately alert the local Fire Marshal, the ENGINEER, and the OWNER of such tank or device. The CONTRACTOR shall exercise all safety precautions and shall comply with all instructions issued by the Fire Marshal and shall cooperate with the OWNER of the tank or device to prevent the occurrence of fire or explosion.
- C. Fire protection alarm and detection systems shall comply with the Michigan International Building Code 2009 and NFPA standards.
- D. Hydrants must be maintained in service and approved during all phases of work.
- E. Storage area for construction materials must not interfere with fire/emergency site access.
- E. All material demolished from site should not be stored on location.

1.9 CHEMICALS

- A. All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, or reactant of other classification, must show approval of either the EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with all applicable rules and regulations.
- B. Provide Safety Data Sheets (SDS) for all chemicals to OWNER.

1.10 FIRST AID FACILITIES AND ACCIDENTS

- A. First Aid Facilities
 - 1. The CONTRACTOR shall provide at the site such equipment and facilities as are necessary to supply first aid to any of CONTRACTOR's personnel who may be injured in connection with the work.
- B. Accidents
 - 1. The CONTRACTOR shall promptly report, in writing, to the ENGINEER and OWNER all accidents whatsoever out of, or in connection with, the performance of the work, whether on or adjacent to the site, which cause death, personal injury or property damage, giving full details and statements of witnesses.
 - 2. If death, serious injuries, or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the OWNER and the ENGINEER.
 - 4. If any claim is made by anyone against the CONTRACTOR or a Subcontractor on account of any accidents, the CONTRACTOR shall promptly report the facts, in writing, to the ENGINEER and OWNER, giving full details of the claim.

1.11 LIMITS OF WORK AREA

- A. The CONTRACTOR shall confine the construction operations within the Contract limits shown on the Drawings and/or property lines and/or fence lines. Storage of equipment and materials, or erection and use of sheds outside of the Contract limits, if such areas are the property of the OWNER, shall be used only with the OWNER's approval. Such storage or temporary structures, even within the Contract's limits, shall be confined to the OWNER's property and shall not be placed on properties designated as easements or rights-of-way unless specifically permitted elsewhere in the Contract Documents.

1.12 WEATHER CONDITIONS

- A. No work shall be done when the weather is unsuitable. The CONTRACTOR shall take necessary precautions (in the event of impending storms) to protect all work, materials, or equipment from damage or deterioration due to floods, driving rain, or wind, and snow storms. The OWNER reserves the right to order that additional protection measures over and beyond those proposed by the CONTRACTOR, be taken to safeguard all components of the Project. The CONTRACTOR shall not claim any compensation for such precautionary measures so ordered, nor claim any compensation from the OWNER for damage to the work from weather elements.
- B. The limitations and requirements for mixing and placing concrete in cold weather shall be as described elsewhere in these Specifications.
- C. The ENGINEER shall have permissive authority over the work which is proposed to be done during the winter months. The CONTRACTOR shall provide adequate weather protection, temporary heating and take any other measures which are necessary to insure that the work performed during the winter months is properly installed and protected against damage from freezing.
- D. Any and all work performed during adverse conditions shall adhere to the applicable Codes and Standards (i.e. ACI, ASTM, etc.).

1.13 USE OF FACILITIES BEFORE COMPLETION

- A. The OWNER reserves the right to enter and use any portion of the constructed facilities before final completion of the whole work to be done under this Contract. However, only those portions of the facilities which have been completed to the OWNER's satisfaction, as evidenced by issuing a Certificate of Partial Completion covering that part of the work, shall be placed in service.
- B. It shall be the OWNER's responsibility to prevent premature connections to or use of any portion of the installed facilities by private or public parties, persons or groups of persons, before the OWNER issues the Certificate of Partial Completion covering that portion of the work to be placed in service.
- C. Consistent with the approved progress schedule, the CONTRACTOR shall cooperate with the OWNER, his agents, and the ENGINEER to accelerate completion of those facilities, or portions thereof, which have been designated for early use by the OWNER.

1.14 DELIVERY, STORAGE, AND HANDLING

- A. All materials, supplies and equipment, whether furnished by the CONTRACTOR or by the OWNER, shall be delivered, stored and handled as to prevent the inclusion of foreign materials and/or damage by water, freezing, breakage or other causes. The ENGINEER may require the CONTRACTOR to provide an enclosed storage shed for the storage of

the above mentioned materials, supplies and equipment. Packaged materials shall be delivered in the original unopened containers and shall be stored until ready for use. All materials which have been stored shall meet the requirements of the Specifications at the time they are used in the project.

PART 2 – PRODUCTS

(NOT USED)

PART 3 – EXECUTION

(NOT USED)

END OF SECTION

SECTION 01210

ALLOWANCES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Cash Allowances

1.2 DEFINITIONS

- A. Cash Allowance: A monetary sum that includes, as part of the Contract Price, the associated costs and requirements to complete the specified allowance.

1.3 SUBMITTALS

- A. CONTRACTOR shall submit detailed proposal to indicate the work to be performed that exceeds Contract scope.
- B. The OWNER will review and either approve or deny the proposal.

1.4 OWNER'S INSTRUCTIONS

- A. Use allowances only as directed for OWNER's purposes, and only by Change Orders which designate amounts to be charged to the allowance.
- B. If the actual price for the specified allowance is more or less than the stated allowance, the Contract Price shall be adjusted accordingly by Change Order. The adjustment in contract price shall be made in accordance with the General Conditions.
- C. At project closeout, any amounts remaining in allowances will be credited to OWNER by Change Order.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 PREPARATION

- A. CONTRACTOR shall coordinate all required materials and labor associated for each allowance item with related materials and work specified in the Contract Documents.

3.2 CASH ALLOWANCE

- A. A cash allowance of \$50,000 shall be included in the contract price for additional work that the OWNER approves in advance. This allowance shall only be used to pay for the pre-approved work that exceeds Contract scope. All paperwork and coordination between the CONTRACTOR and City shall be considered incidental to the Contract.

END OF SECTION

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SECTION 01290

PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Schedule of Values
- B. Initial Application of Payment
- C. Application for Payment
- D. Application for Payment at Substantial Completion
- E. Final Payment Application

1.2 RELATED SECTIONS

- A. Section 01330 - Submittal Procedures

1.3 SCHEDULE OF VALUES

- A. Submit typed schedule for review and approval. The approved schedule of values will be used to prepare future Applications for Payment.
- B. Submit Schedule of Values in triplicate to the ENGINEER within 15 days after date of OWNER-CONTRACTOR Agreement for approval.
- C. Format: Identify each line item with number and title of the major specification Section.
- D. Include within each line item, a direct proportional amount of CONTRACTOR's overhead and profit.
- E. Revise schedule to list approved Change Orders, with each Application for Payment.
- F. Include the following Project Identification on the Schedule of Values:
 - 1. Project Name and Location
 - 2. Name of ENGINEER
 - 3. Project Number
 - 4. CONTRACTOR's Name and Address
 - 5. Date of Submittal
- G. Arrange Schedule of Values in a tabular form with separate rows for each Specification Section and separate columns for each major structure of area of Work. Additionally, separate line items for the following shall be included:
 - 1. Mobilization (Maximum 5% of Contract Total)

2. Bonds & Insurance
 3. Allowances
 4. Start-Up and Commissioning
 5. Training and O&M Manuals
 6. Project Close-Out
- H. Provide a breakdown of the Contract Price in sufficient detail to facilitate continued evaluation of Application for Payment and progress reports. Break principal subcontract amounts down into several line items.
- I. For each part of the Work where an Applicant for Payment may include materials for equipment, purchased or fabricated and stored, but not yet installed, provide separate line items on Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
- J. Update and resubmit schedule of values when change orders result in a change in the contract price.
- K. Schedule of Valves shall be submitted as a shop drawing for OWNER approval.
- L. Schedule of Valves shall be divided into the following major headings:
1. General (Division 1)
 2. Structural (Division 3)
 3. Painting (Division 9)
 4. Turbine work (Division 15)
 5. Electrical (Divisions 16 and 17)

1.4 INITIAL APPLICATION FOR PAYMENT

- A. Administrative actions and submittals that must precede submittal of the first Application for Payment include the following:
1. List of Subcontractors
 2. List of Principal Suppliers and Fabricators
 3. Schedule of Values
 4. CONTRACTOR's Construction Schedule (preliminary not final)
 5. Submittal Schedule (preliminary if not final)

1.5 APPLICATIONS FOR PAYMENT

- A. Submit four (4) copies of each application.
- B. Content and Format: Utilize Schedule of Values and Change Orders for listing items in

Application for Payment.

- C. Payment Period: Payments made according to the schedule described in the General Conditions and or in accordance with the OWNER's requirements.
- D. With each copy of the applications submit Waiver of Lien from all subcontractors or suppliers for work included in Application for Payment, other than the first pay application.
- E. Submit a completed CONTRACTOR's Declaration with each Application for Payment. See Page GC-15 of the General Conditions.

1.6 APPLICATION FOR PAYMENT AT SUBSTANTIAL COMPLETION

- A. Following issuance of Certificate of Substantial Completion, submit an Application for Payment.
- B. Administrative actions and submittals that shall proceed or coincide with this application include:
 - 1. Warranties (guarantees) and maintenance agreements.
 - 2. Test/adjust/balance records.
 - 3. Maintenance instructions; O&M manuals.
 - 4. Start-up performance reports and inspection reports.
 - 5. Changeover information related to OWNER's use, operation and maintenance.
 - 6. Final cleaning.
 - 7. Application for reduction of retainage, and consent of surety.
 - 8. List of incomplete work, recognized as exceptions to ENGINEER's Certificate of Substantial Completion.
 - 9. As-Built Drawings.

1.7 FINAL PAYMENT APPLICATION

- A. Administrative actions and submittals which must precede or coincide with submittal of the final payment Application for Payment include the following:
 - 1. Completion of Project Closeout requirements.
 - 2. Completion of items specified for completion after Substantial Completion.
 - 3. Assurance that unsettled claims will be settled.
 - 4. Assurance that work not complete and accepted will be completed without undue delay.
 - 5. Proof that taxes, fees, and similar obligations have been paid.
 - 6. Removal of temporary facilities and services.

7. Removal of surplus materials, rubbish, and similar elements.
8. CONTRACTOR's waivers of liens for project.
9. Written description of how all punch list items were addressed.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01310

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Project Superintendence
- B. Coordination and Project Conditions
- C. Field Engineering
- D. Pre-Construction Conference
- E. Site Mobilization Meeting
- F. Progress Meetings
- G. Preinstallation Meetings

1.2 PROJECT SUPERINTENDENCE

- A. CONTRACTOR's superintendent shall be on site full time for the duration of the project and shall meet the experience requirements identified in the Instructions to Bidders.

1.3 COORDINATION AND PROJECT CONDITIONS

- A. Coordinate construction operations included under different Section of the Specifications that are dependent upon each other for proper installation, connection, and operation. Where installation of one part of the work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair. Make adequate provisions to accommodate items scheduled for later installation.
- B. CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at Site in accordance with Laws or Regulations. CONTRACTOR shall train CONTRACTOR's employees on use of these sheets and shall keep a master copy on hand at site.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Schedules
 - 2. Installation and removal of temporary facilities.
 - 3. Delivery and processing of submittals.

4. Progress meetings.
 5. Request of information.
 6. Project closeout activities.
- G. Coordinate scheduling, submittals, and Work of the various sections of the Contract Documents to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
 - H. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
 - I. Check motor voltages and control characteristics.
 - J. Coordinate controls, interlocks, wiring of switches, and relays.
 - K. Coordinate wiring and control diagrams.
 - L. After OWNER occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of OWNER's activities.

1.4 FIELD ENGINEERING

- A. CONTRACTOR shall protect survey control and reference points. Promptly notify ENGINEER of any discrepancies discovered.
- B. Field verify all dimensions and measurements.

1.5 PRE-CONSTRUCTION CONFERENCE

- A. OWNER will schedule a pre-construction conference and organizational meeting at the site or other convenient location prior to commencement of construction activities to review responsibilities and personnel assignments.
- B. Attendees: OWNER, ENGINEER and ENGINEER's consultants, CONTRACTOR and its superintendent, major subcontractors, manufacturers, suppliers, utility companies, and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matter relating to the work.
- C. Agenda: Discuss items of significance that could affect progress including such topics as:
 1. Site Access and Badging
 2. Tentative Construction Schedule.
 3. Critical Work sequencing.
 4. Designation of responsible personnel.
 5. Coordination with other construction work and other CONTRACTORS.
 6. Procedures for processing field decisions and Change Orders.

7. Procedures for processing Applications for Payment.
 8. Distribution of Contract Documents.
 9. Submittal of Shop drawings, Product Data, Samples and Schedule.
 10. Preparation of record documents
 11. Use of the premises.
 12. Office, work, and storage areas.
 13. Equipment deliveries and priorities.
 14. CONTRACTOR's Quality Assurance Plan.
 15. Safety procedures.
 16. First Aid.
 17. Security.
 18. Housekeeping.
 19. Working hours.
- D. In addition to the Pre-Construction Conference, ENGINEER may also require a Pre-Excavation, Concrete Pre-Pour Conference, and/or other critical activity conference. CONTRACTOR and Subcontractors performing excavation work on site shall describe their plans for shoring, dewatering, disposal of spoils, and any other particulars of the excavation process, including the technical basis for their selection of the means and methods to be employed.

1.6 SITE MOBILIZATION MEETING

- A. OWNER will schedule a conference at the project site prior to the CONTRACTOR's occupancy.
- B. Attendance required by the OWNER, ENGINEER, CONTRACTOR's Superintendent, and the major subcontractors.
- C. CONTRACTOR shall submit a site plan identifying the CONTRACTOR's limits of work, trailer and storage area locations, for coordination with other work.
- D. Agenda:
 1. Use of premises by OWNER and CONTRACTOR.
 2. OWNER's requirements.
 3. Construction facilities and controls.
 4. Temporary utilities.

5. Security and housekeeping procedures.
6. Schedules.
7. Procedures for maintaining record documents.
8. Inspection and acceptance of equipment put into service during the construction period.

1.7 SITE SAFETY MEETING

- A. OWNER will schedule a conference at the project site prior to the CONTRACTOR's occupancy.
- B. Attendance required by the OWNER, ENGINEER, CONTRACTOR's Superintendent, CONTRACTOR's Safety Officers, and all subcontractors.
- C. Agenda:
 1. Safety procedures.
 2. First Aid
 3. Security

1.8 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at maximum monthly intervals.
- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record and distribute the minutes.
- C. Attendance Required: Job superintendent, major subcontractors and suppliers, OWNER, ENGINEER as appropriate to agenda topics for each meeting.
- D. Agenda:
 1. Review minutes of previous meetings.
 2. Review of Work progress.
 3. Field observations, problems, and decisions.
 4. Identification of problems that impede planned progress.
 5. Review of submittals schedule and status of submittals.
 6. Review of RFI's.
 7. Review of off-site fabrication and delivery schedules.
 8. Maintenance of progress schedule.
 9. Corrective measures to regain projected schedules.

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- 10. Planned progress during succeeding work period.
 - 11. Coordination of projected progress.
 - 12. Maintenance of quality and work standards.
 - 13. Effect of proposed changes on progress schedule and coordination.
 - 14. Other business relating to Work.
- E. Record minutes and distributes copies within two days after meeting to participants, with copies to ENGINEER, OWNER, participants, and those affected by decisions made.
 - F. Submit updated construction schedule to the OWNER/ENGINEER for review two days before each progress meeting. Revise construction schedule as needed after each progress meeting and resubmit to the OWNER/ENGINEER with the meeting minutes.

1.9 PREINSTALLATION OR SHUTDOWN COORDINATION MEETING

- A. When required in individual specification sections, or as deemed necessary by the CONTRACTOR, ENGINEER or OWNER, convene a preinstallation or shutdown coordination meeting at the site prior to commencing work.
- B. Require attendance of parties directly affecting, or affected by, Work of the specific section.
- C. Notify OWNER/ENGINEER five working days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 - 1. Review conditions of shutdown, installation, preparation and installation procedures.
 - 2. Review coordination with related work.
- E. Record minutes and distributes copies within two days after meeting to participants, with copies to ENGINEER/OWNER participants, and those affected by decisions made.

1.10 FINAL INSPECTION MEETING

- A. When the CONTRACTOR has provided written notice that the project is complete, a final inspection meeting shall be scheduled with the CONTRACTOR, ENGINEER, and OWNER.
- B. ENGINEER will notify the CONTRACTOR in writing of all items which this inspection reveals are incomplete or defective.
- C. CONTRACTOR shall immediately take all necessary measures to remedy such deficiencies. A written description of how each item has been addressed shall be submitted to the ENGINEER and OWNER.

1.11 CLOSEOUT/WARRANTY MEETING

- A. Prior to final application for payment, a closeout/warranty meeting shall be scheduled with the CONTRACTOR, ENGINEER and OWNER.

B. Agenda:

1. Project record document review.
2. Verify receipt of spare parts and maintenance products.
3. Review preventative maintenance schedule.
4. Review submitted warranties and bonds.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01320

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Pre-Construction Documentation
- B. Photographic Progress Documentation

1.2 ELECTRONIC STORAGE

- A. Maintain organized electronic storage of project pre-construction and progress photos until Final Payment.

1.3 PRE-CONSTRUCTION DOCUMENTATION

- A. CONTRACTOR shall take a sufficient number of digital pre-construction photographs so as to resolve any disputes, which may arise regarding the considerations prior to and subsequent to construction.
- B. CONTRACTOR shall furnish one USB flash drive of the digital Pre-construction photographs to the ENGINEER, and shall make others available for review in settling any disputes.
- C. If a dispute arises where digital pre-construction photographs was not taken, the disputed area shall be restored to the extent directed by the ENGINEER and to the complete satisfaction of the ENGINEER.

1.4 PROGRESS PHOTOGRAPHS

- A. CONTRACTOR shall take enough digital photographs to sufficiently record the construction progress of the project. All critical construction events shall be thoroughly recorded with photographs.
- B. CONTRACTOR shall maintain one 3-ring binder in the construction trailer with photos printed on 8.5" x 11" pages. Each page of the binder shall have two 4" x 6" digital photos printed along with an identification caption below each photo. Photos shall be organized in tabbed sections by the type of work shown. Photo binder shall be delivered to the OWNER with the final application for payment.
- C. With each application for payment, the CONTRACTOR shall submit all photos taken during the previous month on one USB flash drive.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHS

- A. Digital
- B. Size: 10.0 Megapixel Minimum.
- C. Format: JPEG

2.2 BINDER PAGES

- A. Paper Size: 8.5" x 11"
- B. Paper Weight: 240 g/m².
- C. Finish: Semi-Gloss.

2.3 IDENTIFICATION

- A. Identify in caption below each print.
 - 1. Description and location of view.
 - 2. Time and date of exposure.

PART 3 - EXECUTION

3.1 TECHNIQUE

- A. Factual presentation.
- B. Correct exposure and focus.
 - 1. High resolution and sharp.
 - 2. Maximum depth-of-field.
 - 3. Minimum distortion.

3.2 VIEWS REQUIRED

- A. Consult with ENGINEER for instructions concerning views required.
- B. Photograph from locations to adequately illustrate state of project, or condition of construction.
- C. Take photographs from as close to the same position each time as practical.
- D. Take two series of ground level photographs from each of the corners of the main plant site area on the first day of each month.

- E. In addition, provide photographs prior to, at critical stages of, and at the end of construction, when they do not coincide with scheduled times.

3.3 DELIVERY OF PRINTS

- A. Deliver digital copies of photos monthly to accompany each request for progress payment. Photos shall be submitted on one USB flash drive.
- B. Deliver 3-ring photo binder with the final application for payment.

END OF SECTION

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Submittal Procedures
- B. Certifications
- C. Shop Drawings
- D. Product Data
- E. Samples
- F. Manufacturers' Instructions
- G. Manufacturers' Field Reports
- H. Construction Schedule
- I. Submittal Schedule

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 CONTRACTOR to ENGINEER using a transmittal form. Submittals received from sources other than CONTRACTOR 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 CONTRACTOR'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 CONTRACTOR.

5. Name and address of subcontractor.
 6. Name and address of supplier.
 7. Name of manufacturer.
 8. Number and title of appropriate specification sections.
 9. 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. Submit a schedule of shop drawing submittals.
 - F. Review and approve Shop Drawings, project data, and samples before submitting them.
 - G. Verify field measurements, field construction criteria, catalog numbers, and similar data. Indicate on the submission exactly what was verified.
 - H. Any markings done by CONTRACTOR shall be done in a color other than red. Red is reserved for ENGINEER's marking.
 - I. The number of copies to be submitted will be determined at the pre-construction conference. Reproducible may be submitted and will be marked and returned to CONTRACTOR. Blue or black line prints shall be submitted in sufficient quantity for distribution to ENGINEER and OWNER recipients.
 - J. Coordinate each submittal with the requirements of the Contract Documents.
 - K. Provide space for CONTRACTOR and ENGINEER review stamps.
 - L. Apply CONTRACTOR's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
 - M. Submit the number of copies that the CONTRACTOR requires, plus four copies that will be retained by the OWNER and ENGINEER.
 - N. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.
 - O. 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.
 - P. 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.
 - Q. ENGINEER reserves the right to withhold action on a submittal required coordination with other submittals until related submittals are received.

- R. Do not install materials or equipment which requires submittals until the submittals are returned with ENGINEER's/OWNER's stamp and initials or signature indicating approval. The OWNER shall have final approval authority.
- S. CONTRACTOR's responsibility of errors, omissions, and deviations from requirements of Contract Documents in submittals is not relieved by the ENGINEER's review.
- T. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with requirements.
- U. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.
- V. Submittals not requested in conformance with this Specification will not be recognized or processed.
- W. Revise and resubmit as required, identify all changes made since the previous submittal.
- X. In the event that more than two re-submittals of any submittal is necessary to achieve conformance to the contract requirements, CONTRACTOR shall be charged for excess engineering. The OWNER shall deduct these charges from the CONTRACTOR's final payment. Charges will be \$115.00/hr. minimum 4 hours, for each additional submittal of an item. A tabulated record of such charges will be provided for the CONTRACTOR's review prior to the processing of the final payment.
- Y. Submit new project data and samples when the initial submittal is returned disapproved.

1.3 CERTIFICATIONS

- A. When specified in individual specification sections, submit certification by the manufacturer, installation/application subcontractor, or the CONTRACTOR to ENGINEER, in quantities specified for Product Data.
- 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. Produce copies and distribute in accordance with Paragraph 1.2 - Submittal Procedures.
- 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.
 5. Notation of dimensions established by field measurements.
- D. Nameplate data for equipment including electric motors shall be included on Shop Drawings. Electric motor data shall state the manufacturer, horsepower, service factor, voltage, enclosure type, oversize wiring box, etc.
- E. Shop Drawings shall indicate shop painting requirements to include type of paint and manufacturer.
- F. 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.
- G. 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 CONTRACTOR. The field measurements so established shall be followed by CONTRACTOR and by all affected trades.
- H. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

1.5 PRODUCT DATA

- A. Product Data: 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. Produce copies and distribute in accordance with Paragraph 1.2 - Submittal Procedures.
- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

1.6 SAMPLES

- A. Submit full-size, fully fabricated samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers or materials, color range sets, and swatches showing color, texture, and pattern.
- B. Mount, display, or package samples in the manner specified to facilitate review of qualities indicated. Prepare samples to match ENGINEER's sample. Include the following:

1. Generic description of the sample.
 2. Sample source.
 3. Product name or name of manufacturer.
 4. Compliance with recognized standards.
 5. Availability and delivery time.
- C. Submit samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
- D. Refer to other specifications sections for requirements for samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.
- E. Preliminary Submittals: Where samples are for selection of color, pattern, texture, or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.
1. Preliminary Submittals will be reviewed and returned with ENGINEER's mark indicating selection and other action.
- F. Except for samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 3 sets; one will be returned marked with the action taken.
- G. Maintain sets of samples, as returned, at the site, for quality comparisons throughout the course of construction.
- H. Unless noncompliance with Contract Document provisions is observed the submittal may serve as the final submittal.
- I. Sample sets may be used to obtain final acceptance of the construction associated with each set.

1.7 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 in quantities specified for Product Data.
- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.8 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.

1.9 CONSTRUCTION SCHEDULE

A. Bar Chart Schedule:

1. Prepare a fully developed, horizontal bar chart type construction schedule. Schedule shall be prepared electronically in Microsoft Project with critical path and links shown. Submit color copies of the schedule within 30 days of the date established for commencement of the work.
2. Provide a separate item bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the work as indicated on schedule of values.
3. Prepare schedule of sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for entire construction period.
4. Secure time commitments for performing critical elements of the work from parties involved. Coordinate each element on schedule with other construction activities; include minor elements involved in the sequence of the work. Show each activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the work.
5. Coordinate construction schedule with schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other schedules.
6. Indicate completion in advance of the date established for substantial completion. Indicate substantial completion of schedule to allow time for ENGINEER's procedures necessary for certification of substantial completion

- B. Schedule Updating: Provide an updated construction schedule at each progress meeting. Color copies of the updated schedule shall be prepared for all attendees.

1.10 SUBMITTAL SCHEDULE

- A. After development and acceptance of the construction schedule, prepare a complete schedule of submittals. Submit schedule within 10 days of the date required for establishment of construction schedule.
- B. Coordinate submittal schedule with the list of subcontracts, schedule of values, and the list of products as well as construction schedule.
- C. Prepare schedule in chronological order; include submittals required during the first 90 days Provide the following information:
 1. Scheduled date for the first submittal.
 2. Related section number.
 3. Submittal category.
 4. Name of subcontractor.

5. Description of the part of the work covered.
 6. Scheduled date for Resubmittal.
 7. Scheduled date ENGINEER's final release or approval.
- D. The submittal schedule shall reflect critical path Shop Drawings that must be expedited.
 - E. Following response to initial submittal, print and distribute copies to ENGINEER, OWNER, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the project meeting room and field office.
 - F. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the work and are no longer involved in construction activities.
 - G. Schedule Updating: Provide an updated submittal schedule at each progress meeting.

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 is required or requested, ENGINEER will review each submittal, mark to indicate action taken, and return promptly.
 1. Compliance with specified characteristics is CONTRACTOR'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” CONTRACTOR 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 ENGINEER shall not relieve CONTRACTOR of responsibility for errors on Drawings or submittals as 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 01420

REFERENCES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Reference Standards
- B. Abbreviations and Acronyms

1.2 REFERENCE STANDARDS

- A. Applicability of Standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents. Such standards are made a part of the Contract Documents by reference.
- B. For products or workmanship specified by association, trade, or Federal Standards; comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
 - 1. Applicable Codes – Latest adopted editions of:
 - a. Michigan Building Code / International Building Code.
 - b. The National Electrical Code, NFPA 70, with amendments.
 - c. International Fire Code.
 - d. International Code Council (ICC) ANSI A117.
 - e. Michigan Mechanical and Plumbing Codes.
- C. Conform to reference standard by date of issue current on date of Contract Documents.
- D. Should specified reference standards conflict with Contract Documents, request clarification from ENGINEER before proceeding.
- E. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.3 ABBREVIATIONS AND ACRONYMS

- A. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The following acronyms or abbreviations as referenced in Contract Documents are defined to mean the associated names. Names and addresses are subject to change and are believed to be, but are not assured to be, accurate and up to date as of date of Contract Documents.

AA Aluminum Association
818 Connecticut Avenue, N.W.
Washington, DC 20006

- AABC Associated Air Balance Council
1518 K St. NW, Suite 503
Washington DC, 20005
- AASHTO American Association of State Highway and
Transportation Officials
444 North Capitol St, NW, Suite 249
Washington DC, 20001
- ACI American Concrete Institute
Box 19150
Reford Station
Detroit, MI 48219
- AGC Associated General Contractors of America
1957 E Street, N.W.
Washington, DC 20006
- AISC American Institute of Steel Construction
400 North Michigan Avenue
Eighth Floor
Chicago, IL 60611
- AISI American Iron and Steel Institute
1000 16th Street, N.W.
Washington, DC 20036
- ANSI American National Standards Institute
1430 Broadway
New York, NY 10018
- ASHRAE American Society of Heating, Refrigerating and
Air Conditioning Engineers
1791 Tullie Circle, N.E.
Atlanta, GA 30329
- ASME American Society of Mechanical Engineers
345 East 47th Street
New York, NY 10017
- ASTM American Society for Testing and Materials
1916 Race Street
Philadelphia, PA 19103
- AWS American Welding Society
550 LeJeune Road, N.W.
Miami, FL 33135
- AWWA American Water Works Association
6666 West Quincy Avenue
Denver, CO 80235
- BIA Brick Institute of America
11490 Commerce Park Drive
Reston, VA 22091

- CFR Code of Federal Regulations
Office of the Federal Register
National Archives and Records Administration
Washington, DC 20408
- CRSI Concrete Reinforcing Steel Institute
933 Plum Grove Road
Schaumburg, IL 60195
- DHI Door and Hardware Institute
7711 Old Springhouse Road
McLean, VA 22102
- EJCDC Engineers' Joint Contract Documents Committee
American Consulting Engineers Council
1015 15th Street, N.W.
Washington, DC 20005
- FM Factory Mutual System
1151 Boston-Providence Turnpike
P.O. Box 688
Norwood, MA 02062
- FS Federal Specification
General Services Administration
Specifications and Consumer Information
Distribution Section (WFSIS)
Washington Navy Yard, Bldg. 197
Washington, DC 20407
- ICBO International Conference of
Building Officials
5360 S. Workman Mill Road
Whittier, CA 90601
- IEC International Electrochemical Commission
446 Main Street, 16th
Worcester, MA 01608
- IEEE Institute of Electrical and Electronics Engineers
345 East 47th Street
New York, NY 10017
- IMIAC International Masonry Industry All-Weather Council
International Masonry Institute
815 15th Street, N.W.
Washington, DC 20005
- ISA The Instrumentation, Systems, and Automation Society
67 Alexander Drive
P.O. Box 12277
Research Triangle Park
North Carolina 27709

- MBMA Metal Building Manufacturers Association
1300 Summer Ave
Cleveland, OH 44115-2851
- NAAMM National Association of Architectural Metal Manufacturers
221 North LaSalle Street
Chicago, IL 60601
- NCMA National Concrete Masonry Association
P.O. Box 781
Herndon, VA 22070
- NEMA National Electrical Manufacturers' Association
2101 'L' Street, N.W.
Washington, DC 20037
- NFPA National Fire Protection Association
Battery March Park
Quincy, MA 02269
- PCA Portland Cement Association
5420 Old Orchard Road
Skokie, IL 60077
- PCI Prestressed Concrete Institute
201 North Wells Street
Chicago, IL 60606
- PS Product Standard
U. S. Department of Commerce
Washington, DC 20203
- SDI Steel Deck Institute
P.O. Box 9506
Canton, OH 44711
- SDI Steel Door Institute
712 Lakewood Center North
14600 Detroit Avenue
Cleveland, OH 44107
- SSPC Steel Structures Painting Council
4400 Fifth Avenue
Pittsburgh, PA 15213
- UL Underwriters' Laboratories, Inc.
333 Pfingston Road
Northbrook, IL 60062

- B. Government Agencies: Names and titles of state and federal government standard or specification producing agencies are frequently abbreviated. The following acronyms or abbreviations referenced in the Contract Documents indicate names of standard or specification producing agencies of the federal government. Names and addresses are subject to change but are believed to be, but are not assured to be, accurate and up to date as of the date of the Contract Documents.

CE Corps of Engineers
(US Department of the Army)
Chief of Engineers - Referral
Washington, DC 20314

CFR Code of Federal Regulations
(Available from the Government Printing Office)
N. Capitol Street between G and H St. NW

DOT Department of Transportation
400 Seventh Street, SW
Washington, DC 20590

EDA Economic Development Administration
US Department of Commerce
121 N Canal Street, Suite 855
Chicago, IL 60606

EPA Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

FERC Federal Energy Regulatory Commission
Office of Energy Projects
Division of Dam Safety and Inspections - Chicago Regional Office
230 South Dearborn Street, Suite 3130
Chicago, IL 60604

MDEQ Michigan Department of Environmental Quality

MDOT Michigan Department of Transportation

MIOSHA State of Michigan OSHA

OSHA Occupational Safety and Health Administration
(US Department of Labor)
Government Printing Office
Washington, DC 20402

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01450

QUALITY CONTROL

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Quality Control and Control of Installation
- B. References
- C. Testing and Inspection Services
- D. Manufacturers' Field Services

1.2 QUALITY CONTROL AND CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from ENGINEER before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform Work by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on Shop Drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
- H. All materials and equipment shall be new, unless otherwise noted.

1.3 REFERENCES

- A. Conform to reference standard by date of issue current on date of Contract Documents.
- B. Should specified reference standards conflict with Contract Documents, request clarification from the ENGINEER before proceeding.
- C. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the ENGINEER shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.4 TESTING AND INSPECTION SERVICES

- A. CONTRACTOR shall be responsible for providing, paying for, coordinating and scheduling the services of an independent testing firm (acceptable to OWNER) to perform all materials testing and related tasks.
- B. The independent firm will perform tests, inspections and other services specified in individual specification sections and as required by the ENGINEER.
- C. Acceptable concrete materials testing companies for selection by the CONTRACTOR are:
 - 1. CTI (Brighton, Michigan; Telephone: (248) 486-5100)
 - 2. SME (Plymouth, Michigan; Telephone: (734) 454-9900)
 - 3. Haengel and Associates (Canton, Michigan; Telephone: (734) 455-9771)
 - 4. TEC (Ann Arbor, Michigan; Telephone: (734) 623-0400)
- D. Acceptable paint inspection companies are:
 - 1. Nelson Tank Engineering and Consulting (Lansing, Michigan; Telephone: (517) 321-1692)
 - 2. Dixon Engineering (Lake Odessa, Michigan; Telephone: (616) 374-3221)
- E. Testing, inspections and source quality control may occur on or off the project site. Perform off-site testing as required by the ENGINEER or the OWNER.
- F. Reports will be submitted by the independent firm to the ENGINEER and CONTRACTOR, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- G. CONTRACTOR shall coordinate with ENGINEER and/or OWNER; cooperate and coordinate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
 - 1. Notify ENGINEER and independent firm a minimum of 24 hours prior to expected time for operations requiring services.
 - 2. Make arrangements with independent firm and pay for additional samples and tests required for CONTRACTOR's use.
- H. Independent testing firm will provide the testing services listed below. Any additional required by the Contract Documents beyond what is listed, shall be provided by the CONTRACTOR.
 - 1. Concrete. All tests shall be performed each load.
 - a. Temperature
 - b. Slump

- c. Air entrainment
 - d. Comprehensive strength. Five (5) cylinders each with laboratory testing.
 - 2. Painting. Inspector shall be on site while painter is doing surface preparation or applying coatings.
 - a. Surface preparation.
 - b. Conditions, including ambient and surface temperatures, humidity, dew point and other factors that might affect coatings.
 - c. Thickness of all coatings.
 - d. Coating surface. Flaws such as holidays, runs, etc, shall be flagged for correction and reinspected after correction.
- I. CONTRACTOR shall not perform the work without the independent firm on site performing the required tests.
- J. Testing and employment of testing agency or laboratory shall not relieve CONTRACTOR of obligation to perform Work in accordance with requirements of Contract Documents.
- K. The independent firm on instructions by the ENGINEER shall perform re-testing or re-inspection required because of non-conformance to specified requirements. Payment for re-testing or re-inspection will be the responsibility of the CONTRACTOR.
- L. Agency Responsibilities:
 - 1. Test samples of mixes submitted by CONTRACTOR.
 - 2. Provide qualified personnel at site. Cooperate with ENGINEER and CONTRACTOR in performance of services.
 - 3. Perform specified sampling and testing of products in accordance with specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify ENGINEER and CONTRACTOR of observed irregularities or non-conformance of Work or products.
 - 6. Perform additional tests required by ENGINEER.
- M. Agency Reports: After each test, promptly submit two copies of report to ENGINEER and to CONTRACTOR. When requested by ENGINEER, provide interpretation of test results. Include the following:
 - 1. Date issued.
 - 2. Project title and number.

3. Name of inspector.
 4. Date and time of sampling or inspection.
 5. Identification of product and specifications section.
 6. Location in the Project.
 7. Type of inspection or test.
 8. Date of test.
 9. Results of tests.
 10. Conformance with Contract Documents.
- N. Limits On Testing Authority:
1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency or laboratory may not approve or accept any portion of the Work.
 3. Agency or laboratory may not assume any duties of CONTRACTOR.
 4. Agency or laboratory has no authority to stop the Work.

1.5 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, as applicable, and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Temporary Utilities
 - 1. Temporary Lighting for Construction Purposes
 - 2. Temporary Sanitary Facilities
- B. Construction Facilities
 - 1. Field offices and sheds.
- C. Temporary Controls
 - 1. Barriers.
 - 2. Protection of the Work.
 - 3. Security measures.
- D. Removal of utilities, facilities, and controls.

1.2 TEMPORARY ELECTRICITY

- A. Provide and pay for power service required from utility source as needed for construction operation.
- B. Provide temporary electric feeder from electrical service at location as directed. Provide all necessary meters, disconnections and transformers. A separate meter shall be installed by the CONTRACTOR for the purpose of establishing compensation for electrical power usage.
- C. Complement existing power service capacity and characteristics as required.
- D. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.
- E. Provide main service disconnect and over-current protection at convenient location.

1.3 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

- A. Provide and maintain incandescent lighting for construction operations.
- B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- C. Maintain lighting and provide routine repairs.

1.4 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Existing facility use is not permitted. Provide at the time of project mobilization. Provide chemical toilets and provisions for replacement of chemicals and disposal of wastes for the duration of the Contract.

1.5 FIELD OFFICES AND SHEDS

- A. Prepare a Drawing for submittal and approval showing construction facility layouts including temporary facilities, storage areas, parking, construction work and other related activities.
- B. The ENGINEER does not require a field office.
- C. Existing facilities shall not be used for field offices or for storage.
- D. Construction: Portable or mobile buildings, or buildings constructed with floors raised above ground, securely fixed to foundations with steps and landings at entrance doors.
 - 1. Construction: Structurally sound, secure, weather tight enclosures for office and storage spaces. Maintain during progress of Work; remove when no longer needed.
 - 2. Temperature Transmission Resistance of Floors, Walls, and Ceilings: Compatible with occupancy and storage requirements.
 - 3. Exterior Materials: Weather resistant, finished in color acceptable to ENGINEER.
 - 4. Interior Materials in Offices: Sheet type materials for walls and ceilings, pre-finished or painted; resilient floors and bases.
 - 5. Lighting for Offices: 50 ft-C (538 lx) at desk top height, exterior lighting at entrance doors.
 - 6. Fire Extinguishers: Appropriate type fire extinguisher at each office and each storage area.
 - 7. Interior Materials in Storage Sheds: As required to provide specified conditions for storage of products.
- E. Environmental Control
 - 1. Heating and Ventilating for Offices: Automatic equipment to maintain comfort conditions.
 - 2. Storage Spaces: Heating and ventilation as needed to maintain products in accordance with Contract Documents; adequate lighting for maintenance and inspection of products.
- F. Storage Areas and Sheds: Size to storage requirements for products of individual Sections, allowing for access and orderly provision for maintenance and for inspection of products.
- G. Preparation: Fill and grade sites for temporary structures to provide drainage away from buildings.

1.6 BARRIERS

- A. Provide barriers to protect existing facilities and adjacent properties from damage from construction operations.
- B. Provide protection for plant life designated to remain. Replace damaged plants.
- C. Protect non-owned vehicular traffic, stored materials, site and structures from damage.
- D. Protect public and pathways when needed. If required, close access to the crossing over Barton Dam only following 24-hour notice to the OWNER and OWNER's permission.

1.7 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual specification Sections.
- B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to minimize damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic from landscaped areas.

1.8 REMOVAL OF UTILITIES, FACILITIES AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01550

VEHICULAR ACCESS AND PARKING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Vehicular Access
- B. Security
- C. Parking Areas

1.2 DESCRIPTION

- A. CONTRACTOR shall maintain during the Project for use by CONTRACTOR, OWNER's operations, chemical deliveries, other CONTRACTORS working on the Project, and emergency vehicles. Temporary roads and parking areas shall be designed and maintained by CONTRACTOR and be fully usable in all weather conditions.
- B. Use of Existing Access Roads/Drives
 - 1. CONTRACTOR will be allowed to use OWNER'S existing roads/drives upon obtaining OWNER's written permission.
 - 2. Prevent interference with traffic on existing roads, drives and parking areas. At all times, keep access roads and entrances serving the Site clear and available to OWNER, OWNER's employees, chemical deliveries, emergency vehicles, and other contractors. Do not use these areas for parking or storage of materials.
 - 3. CONTRACTOR shall indemnify and hold harmless OWNER from expenses caused by CONTRACTOR's operations over existing roads and parking areas.
 - 4. Schedule deliveries to minimize use of driveways and entrances.

1.3 SITE ACCESS

- A. CONTRACTOR shall access the site via Barton Drive.

1.4 SECURITY

- A. The CONTRACTOR shall abide by and implement all site security measures in use at the Ann Arbor Water Treatment Plant, whether in use at Bid time or subsequently implemented by the OWNER.
- B. CONTRACTOR's security procedures shall include but shall not be limited to:
 - 1. Maintain daily sign-in/sign-out log of personnel and visitors.
 - 2. Maintain daily log of vehicle license plate numbers on site.

3. Provide and use photo ID's for all CONTRACTOR personnel. ID's shall identify the personnel's name, company, and role on the project.
 4. Allow OWNER to conduct background checks on CONTRACTOR's personnel upon request.
- C. Use of OWNER's security measures does not relieve CONTRACTOR of its responsibility to secure its own working spaces and materials.

1.5 CONTRACTOR PARKING

- A. CONTRACTOR may park a limited number of construction vehicles within the staging area, provided a suitable parking area is constructed.
- B. Disruption to the neighborhood (idling engines, radios, lights, etc.) before or after approved construction hours is prohibited.

1.6 MAINTENANCE OF ACCESS

- A. CONTRACTOR shall maintain gate, driveway and parking to continuously provide access for WTP staff vehicles, OWNER vehicles, chemical deliveries for OWNER, emergency vehicles, and parking areas for OWNER's personnel.
- B. Public roads shall be passable at all times and no parking which disrupts traffic is permitted.
- C. When roads and parking without hard surfacing become contaminated with soil and create a nuisance, remove contaminated material and replace with clean aggregate as required.

1.7 RESTORATION

- A. Restore to pre-construction conditions existing roads, walks, and parking areas damaged by CONTRACTOR, subject to approval of OWNER of roads, walks, and parking areas.
- B. Repair all rutting and restore damaged grass.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01600

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Basic Product Requirements
- B. Product Options
- C. Product Substitution Procedures
- D. Product Delivery Requirements
- E. Product Storage and Handling Requirements

1.2 BASIC PRODUCT REQUIREMENTS

- A. Provide products of qualified manufacturers suitable for intended use. Provide products of each type by a single manufacturer unless specified otherwise.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
- C. Provide interchangeable components of the same manufacturer for similar components.

1.3 PRODUCT DELIVERY REQUIREMENTS

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products in accordance with manufacturers' instructions.
- B. Store with seals and labels intact and legible.
- C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- D. For exterior storage of fabricated products, place on sloped supports above ground.
- E. Provide off-site storage and protection when site does not permit on-site storage or protection.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation and degradation of Products.

BARTON DAM HYDROTURBINE – 10-YEAR INSPECTION AND OVERHAUL

- G. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained under acceptable condition.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01730

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes, but is not limited to, all demolition and removals of existing materials, equipment necessary to complete the work specified and as shown on the Contract Drawings. Items for removal include process piping, valves, concrete, resteel, walls, doors, windows, structural steel, metals, masonry, electrical equipment, mechanical equipment and all related items.
- B. Old parts shall be turned over to the OWNER unless instructed otherwise.

1.2 SECTION INCLUDES

- A. Selective removal and off-site disposal of following:
 - 1. Removal of all items marked "remove" or "demolish" on Drawings.
 - 2. Removal and protection of existing fixtures and equipment items identified for salvage by the OWNER.
 - 3. Removal, protection, and reinstallation of existing fixtures and equipment items shown or marked as "remove and reinstall".

1.3 DEFINITIONS

- A. Remove: Remove and dispose of items shown or scheduled. Discard demolished or removed items except for those shown to remain, those shown as reinstalled, those shown as salvaged, and historical items that are to remain OWNER's property.
- B. Remove and Salvage: The OWNER may elect to retain some equipment. Carefully remove and clean salvage items, pack or crate to protect against damage. Transport to a location identified by the OWNER.
- C. Remove and Reinstall: Remove items shown; clean, service and otherwise prepare them for reuse; store and protect against damage. Reinstall items in same location or in location shown.
- D. Existing to Remain: Protect construction or items shown to remain against damage during selective demolition operations. When permitted by ENGINEER, CONTRACTOR may elect to remove items to suitable, protected storage location during selective demolition and properly clean and reinstall items in their original locations.

1.4 SUBMITTALS

- A. Shop Drawings: Submit Shop Drawings covering the items included under this Section. Shop Drawing submittals shall include:
 - 1. Proposed dust-control measures.

- B. Submit schedules listed below to ENGINEER and OWNER.
1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
 2. Inventory list of removed existing equipment not reused in Contract Work. Submit lists to OWNER. All old parts to be turned over to the OWNER unless instructed otherwise.
 3. Inventory list of removed and salvaged items.
 4. Interruption of utility service.
 5. Coordination for shutoff, capping, and continuation of utility service
 6. Detailed sequence of selective demolition and removal work to ensure uninterrupted progress of OWNER's on-site operations.
 7. Coordination of OWNER's continuing occupancy of portions of existing building and of OWNER's partial occupancy of completed work.
 8. Locations of temporary partitions and means of egress.
- C. Inventory list of existing equipment to be removed and not reused in Work. OWNER to determine or select items or retention by OWNER

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements:
1. Demolition operations shall comply with OSHA and EPA requirements and EPA notification regulations insofar as they apply to demolition Work under this Contract.
 2. Comply with hauling and disposal regulations of authorities having jurisdiction.
 3. If hazardous materials are found during demolition operations, comply with all applicable local, state and national requirements for removal and disposal.
- B. Facility Access:
1. Do not close, block or obstruct streets, walks or other occupied or used facilities without written permission from authorities having jurisdiction.
 - a. Use alternative routes around closed or obstructed routes if required by governing regulations.
 2. Coordinate with OWNER's continuing occupation of portions of existing building, and OWNER's partial occupancy of completed new addition.
 3. Plan and present the CONTRACTOR's plan for achieving the partial occupation by OWNER in a submittal and in a meeting with the OWNER and ENGINEER.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Disassemble or cut large equipment items into smaller pieces to promote safe removal and transportation
 - 1. Transport and unload items requested by OWNER to a designated location at the project site.
 - 2. Haul away and dispose of debris and materials neither retained by OWNER, nor reused or reinstalled.
 - 3. Arrange for disposal areas.
 - 4. Traffic: Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
- B. Unloading Salvage Items: Where shown on Drawings as "Remove and Salvage," carefully remove shown items, clean, store and turn over to OWNER and obtain receipt. OWNER will designate site for receiving items.
- C. Handling: CONTRACTOR shall take every precaution to prevent spillage of materials being hauled in public streets.
 - 1. It shall be CONTRACTOR's responsibility to immediately clean spillage that may accidentally occur.
 - 2. Do not burn removed material on or within project site.

1.7 SEQUENCING

- A. Conduct selective demolition work in manner that minimizes need for disruption or interference of OWNER's normal on-site operations.
- B. Coordinate with OWNER's continuing occupation of portions of existing building, with sequencing and startup of the new equipment.
- C. Include coordination for shutoff, capping, and continuation of utility services, together with details for dust and noise control protection to ensure uninterrupted on-site operations by OWNER.

1.8 SCHEDULING

- A. Schedule: Submit schedule showing proposed methods and sequence of operations for selective demolition work to OWNER's representative for review before commencement of Work.
- B. Arrange selective demolition schedule so as not to interfere with OWNER's on-site operations.
- C. Give minimum of 30 days advance notice to OWNER of demolition activities, which affect OWNER's normal operations.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Site Verification of Conditions: Before beginning selective demolition work inspect areas of Work. Survey existing conditions and correlate with requirements shown to determine extent of selective demolition required. Photograph existing structure surfaces, equipment, or surrounding properties, which could be misconstrued as damage resulting from selective demolition work. File with OWNER's representative before starting Work.
- B. Inventory and record condition of items scheduled as "remove and reinstall or items scheduled as "remove and salvage."
- C. Verify disconnection and capping of utilities within the affected area of Work.
- D. If unanticipated mechanical, electrical, or structural elements conflict with intended function or design, investigate, and measure nature and extent of conflicts. Promptly submit detailed written reports to OWNER's Representative. Pending receipt of directive from OWNER's Representative, rearrange selective demolition schedule to continue general job progress without delay.

3.2 UTILITY SERVICES

- A. Where utility services are scheduled for removal, relocation, or abandonment, install bypass connections and temporary service to maintain continuity of services to other building parts before proceeding with selective demolition.
- B. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction.
- C. Maintain existing utilities shown as remaining. Keep in service, and protect existing utilities against damage during selective demolition operations.
- D. Locate, identify, stub off and disconnect utility services that are not to remain active.
 - 1. OWNER will arrange to shut off designated utilities when requested by CONTRACTOR.

3.3 PREPARATION

- A. Drain, purge, or remove, collect and dispose of chemicals, gases, explosives, acids, flammable, or other dangerous material before proceeding with selective demolition operations.
- B. Protect existing finish work that remains in place and becomes exposed during demolition operations.
- C. Protect floors with suitable coverings when necessary.

- D. Where selective demolition occurs immediately adjacent to occupied portions of building or near sensitive equipment, construct and maintain temporary, insulated, fire-rated solid dustproof partitions.
 - 1. Construct dustproof partitions of minimum 4-inch studs, 5/8-inch-thick drywall (joints taped on occupied side), 1/2-inch fire-retardant plywood on demolition side.
 - 2. Equip partitions with dustproof doors and security locks if required.
- E. Provide dust-proof enclosures to protect the turbine intake and other sensitive equipment.
- F. Provide weatherproof closures for exterior openings resulting from demolition Work. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces, and installation of new construction to ensure that no water leakage or damage occurs to structure or interior areas of existing building.
- G. Provide and ensure free and safe passage of OWNER's personnel and general public to and from occupied portions of building around selective demolition areas.
 - 1. Provide temporary barricades and other forms of protection to protect OWNER's personnel and general public from injury.
- H. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of demolished structures or elements, or adjacent facilities or Work to remain.
- I. Cease operations and notify OWNER's Representative immediately if safety of structure seems endangered. Take precautions to support structure until determination is made for continuing operations.
- J. Remove protection at completion of Work.

3.4 DEMOLITION

- A. Special Techniques: Demolish concrete in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.
- B. For interior slabs, use power saw or removal methods that do not crack or structurally disturb adjacent slabs or partitions.
- C. Explosives: Use of explosives is not allowed.
- D. Interface with Other Work: Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors, or framing.
- E. Site Tolerances: Provide services for effective air and water pollution controls required by local authorities having jurisdiction.

3.5 REPAIR\RESTORATION

- A. Repair damages caused by demolition more extensive than required.

- B. Return structures and surfaces to condition existing before commencing selective demolition Work.
- C. Repair adjacent construction or surfaces soiled or damaged by selective demolition Work.
- D. Promptly repair damages caused to adjacent facilities by demolition Work at no cost to OWNER.

3.6 CLEANING

- A. CONTRACTOR shall maintain an order of neatness and good housekeeping comparable to that observed by OWNER.
- B. Keep tools, scaffolding, and other demolition equipment in neat and orderly arrangement.
- C. Remove dirt and debris resulting from CONTRACTOR's demolition operations from Site daily. Dirt and debris shall not collect or interfere with OWNER's facility operations.
- D. Upon completion of demolition Work, remove tools, equipment, and demolished materials from Site. Remove protection and leave interior areas broom clean.

END OF SECTION

SECTION 01740

CLEANING AND WASTE MANAGEMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Progress Cleaning
- B. Final Cleaning

1.2 GENERAL

- A. Execute cleaning, during progress of the Work, and at completion of the Work.
- B. Adequate periodic cleaning will be a condition for recommendation of progress payments.
- C. Waste Disposal
 - 1. Properly dispose all waste materials, surplus materials, debris, and rubbish off the project Site.
 - 2. Provide suitable containers for storage of waste materials and debris.
 - 3. Do not burn or bury rubbish and waste materials on the project Site.
 - 4. Do not dispose of volatile or hazardous wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
 - 5. Do not discharge wastes into streams or waterways.
 - 6. Comply with all federal, state, and local anti-pollution laws, ordinances, codes, and regulations when disposing waste materials, debris, and rubbish.

1.3 PROGRESS CLEANING

- A. CONTRACTOR shall periodically clean the work site at least once weekly.
- B. Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the work.
- C. Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended.
- D. Remove debris from concealed spaces before enclosing the space.
- E. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials.
- F. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration.

- G. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- H. Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces and will not contaminate building systems or electrical or control panels.

1.4 FINAL CLEANING

- A. Complete the following cleaning and waste-removal operations before requesting inspection for certification of Substantial Completion for entire project or for a portion of project:
 - 1. Clean and remove from the Project rubbish, waste material, debris, and other foreign substances.
 - 2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - 3. Power wash construction and staging areas.
 - 4. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - 5. Leave watercourses, gutters, and ditches open and clean.
 - 6. Repair pavement, roads, sod, and all other areas affected by construction operations and restore them to original condition or to minimum condition specified.
 - 7. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of spatter, grease, stains, fingerprints, films, and similar foreign substances.
 - 8. Sweep concrete floors broom clean in unoccupied spaces.
 - 9. Remove tags and labels that are not permanent.
 - 10. Touch up and otherwise repair and restore chipped, scratched, dented, or otherwise marred surfaces to specified finish and match adjacent surfaces. 1) Do not paint over "UL" or similar labels, including mechanical and electrical nameplates.
 - 11. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and concrete droppings, and other foreign substances.
- B. Maintain the cleaning until OWNER occupies the Project or portion thereof.
- C. Leave Project clean and in a neat and orderly condition satisfactory to ENGINEER.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.
- C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01770

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

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

1.2 SUBSTANTIAL COMPLETION

- A. Substantial completion shall be the date as certified by the ENGINEER when the construction of the project, or a specified part thereof, is sufficiently completed, in accordance with the Contract Documents, so that the Project, or specified part, 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 Commissioning.
- C. Before requesting inspection for Certification of Substantial Completion, complete the following. List exceptions in the request.
 - 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the work claimed as substantially complete. Include supporting documents for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the contract price.
 - 2. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the work is not complete.
 - 3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and/or similar documents.
 - 4. Complete final cleanup requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.
 - 5. Provide all required demonstration and training sessions.
- D. Inspection Procedures: On receipt of a request for inspection, ENGINEER will either proceed with inspection or advise CONTRACTOR of unfilled requirements.
 - 1. ENGINEER will prepare the Certificate of Substantial Completion following inspection, or advise CONTRACTOR of construction that must be completed or corrected before the certificate will be issued.
 - 2. ENGINEER will repeat inspection when requested and assured that the work has been substantially completed.
 - 3. Results of completed inspection will form the basis of requirements for final acceptance.

4. Date of Substantial Completion will begin the warranty period unless noted otherwise.

1.3 FINAL ACCEPTANCE

- A. Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
 1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 2. Submit an updated final statement, accounting for final additional changes to the contract price.
 3. Submit a copy of ENGINEER's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance. The list shall be endorsed and dated by the ENGINEER.
 4. Submit consent of surety to final payment.
 5. Submit a final liquidated damages settlement statement.
 6. Submit record Drawings, maintenance manuals, and similar final record information.
 7. Deliver tools, spare parts, extra stock, and similar items.
 8. Complete commissioning.
 9. Discontinue or change over and remove temporary facilities from the site, along with construction tools, and similar elements.
 10. Complete final cleaning in accordance with Section 01740 – Cleaning and Waste Management.
- B. Reinspection Procedure: ENGINEER will inspect the work upon receipt of notice that work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the ENGINEER.
 1. Upon completion of reinspection, ENGINEER will prepare a certificate of final acceptance, or advise CONTRACTOR of work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 2. If necessary, reinspection will be repeated.

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, using procedure specified in Section 01290, Payment Procedures.

- B. Request for final payment shall include:
1. Documents required for progress payments in Section 01290, Payment Procedures.
 2. Documents required in the General Conditions, as may be modified by the Supplementary Conditions.
 3. Releases or Waivers of Lien Rights:
 - a. When submitting releases or waivers of Lien rights, provide release or waiver by CONTRACTOR and each Subcontractor and Supplier that provided CONTRACTOR with 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 CONTRACTOR, and shall include Subcontractor's or Supplier's corporate seal if applicable.
 - 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 being maintained by the CONTRACTOR.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 03100

CONCRETE FORMWORK

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Furnish and install formwork for cast-in-place concrete.

1.2 REFERENCES

- A. American Concrete Institute (ACI)
 - 1. 347 - Recommended Practice for Concrete Formwork.

1.3 SUBMITTALS

- A. Submittals shall conform to Section 01330.
- B. Submit product data for form ties.

1.4 QUALITY ASSURANCE

- A. The design, engineering, and proper construction of all formwork shall be the responsibility of the CONTRACTOR.
- B. Design formwork in accordance with ACI 347.

1.5 PRODUCT HANDLING

- A. Do not store forms or equipment on finished slabs.

PART 2 – PRODUCTS

2.1 FORM MATERIAL

- A. Form facing material shall be smooth faced, undamaged plywood or other panel type material approved by the ENGINEER.
- B. The form facing material shall produce a smooth, hard, uniform texture on the concrete.
- C. The arrangement of the facing material shall be orderly and symmetrical with the number of seams kept to a minimum.
- D. Facing material with raised grain, torn surfaces, worn edges, patches, dents, or other defects which will impair the texture of the concrete surface shall not be used.

2.2 FORM TIES

- A. Form ties shall be factory fabricated, adjustable length, removable or snap-off metal form ties designed to prevent form deflection and to prevent spalling concrete surfaces upon removal.
- B. The portion of the tie remaining in the concrete after removal of the tie shall be at least 1 inch from the surface of the concrete.
- C. Provide waterseals on all wall ties used in water containment structures and exterior walls.

2.3 FORM COATINGS

- A. Form coatings or release agents shall be commercially formulated chemical release agents containing no lubrication oil, conventional form oil, fuel oil, or kerosene.
- B. The form coating shall not penetrate, stain, or leave a residual film on the concrete surface and shall not attract dirt or other deleterious material.

2.4 ACCESSORIES

- A. Chamfer strips shall be 3/4 inch by 3/4 inch wood or plastic strips.
- B. Provide all anchorages, braces, and special forms required to construct cast-in-place concrete components shown on the Drawings.

PART 3 – EXECUTION

3.1 GENERAL

- A. Establish a benchmark in an accessible location and use as a reference point for various construction levels.
- B. Verify lines, levels, and centers before proceeding with formwork.
- C. Insure that dimensions agree with the Drawings. Report any discrepancies to the ENGINEER before proceeding with Work.

3.2 FORMWORK DESIGN

- A. The design, engineering, and construction of the formwork shall be the responsibility of the CONTRACTOR.
- B. Formwork shall be designed in accordance with ACI 347.
- C. Formwork shall be designed, erected, supported, braced, and maintained to safely support all vertical and lateral loads that might be applied until such loads can be supported by the concrete structure.

- D. Formwork shall be cambered to compensate for anticipated deflections in the formwork prior to hardening of the concrete.
- E. Positive means of adjustment of shores and struts shall be provided and all settlement shall be taken up during concrete placing operations. Forms shall be securely braced against lateral deflections.

3.3 FORMWORK CONSTRUCTION

- A. Provide forms for all concrete work. Earth cuts shall not be used as forms for vertical surfaces.
- B. Construct forms to conform to slopes, lines, and dimensions shown on the Drawings.
- C. Forms shall be sufficiently tight to prevent loss of mortar from the concrete.
- D. Place chamfer strips at all exposed corners.
- E. Install all required openings, frames, pipe sleeves, cavities, slots, and other embedded items.
- F. Cut all holes in forms required for installation or embedment of concrete reinforcement bars and ties.
- G. Conform to manufacturer’s recommendations for installation of void forms. Verify proper preparation of base materials prior to installation of void forms.
- H. Provide sharp clean corners at intersecting planes without visible edges or offsets. Back joints with extra studs or girts to maintain true, square corners.
- I. Temporary openings shall be provided at the base of column forms and wall forms to facilitate cleaning and observation immediately before concrete is placed. Construct closures to ensure a tight fit flush with the adjoining surfaces.
- J. Provide runways for moving equipment. Runways shall be provided with struts or legs and shall be supported directly on the formwork. Runways shall not rest on the reinforcing steel.
- K. Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris before concrete is placed.

3.4 TOLERANCES

- A. Construct formwork so that concrete surfaces will conform with the following tolerances:
 - 1. Variation from plumb.

In any 10 feet of length	1/4 inch.
Maximum for entire length	1/2 inch.

2. Variation from the level or specified grade.

In any 10 feet of length	1/4 inch.
Maximum for entire length	1/2 inch.

3. Variation of the linear building lines from established position in plan and related position of columns, walls, and partitions.

In any 20 feet of length	1/2 inch.
Maximum for entire length	1 inch.

4. Variation in the sizes and locations of sleeves, floor openings, and wall openings:

± 1/4 inch.

5. Variation in cross-sectional dimensions of columns and beams and in the thickness of slabs and walls.

Minus	1/4 inch.
Plus	1/2 inch.

3.5 FORM SURFACE PREPARATION

- A. Clean surfaces of forms and embedded material of all accumulated mortar or grout from previous concreting and of all other foreign material before concrete is placed. Before placing the reinforcing steel or the concrete, the surfaces of the forms shall be covered with an acceptable coating material that will effectively prevent absorption of moisture, prevent bond with the concrete, and not stain the concrete surfaces.
- B. Excess form coating material shall not stand in puddles in the forms.
- C. Form coating material shall not come in contact with hardened concrete against which fresh concrete is to be placed.
- D. Spray form coating on all concrete form surfaces, including wood forms for wall openings, keyway strips, and chamfer strips.

3.6 RE-USE OF FORMS

- A. Clean and repair surfaces of forms to be re-used.
- B. Do not use split, frayed, delaminated, or otherwise damaged form facing material.

3.7 FORM REMOVAL

- A. Formwork for columns, walls, sides of beams, and other parts not supporting the weight of the concrete may be removed as soon as the concrete has hardened sufficiently to resist damage from removal operations, but not less than 24 hours after completing concrete placement and finishing.
- B. Forms and shoring used to support the weight of concrete in beams, slabs, and other structural members shall not be removed in less than 10 days and not until the concrete has attained 3,500 psi minimum compressive strength. Compressive strength shall be determined by field-cured specimens.

- C. The CONTRACTOR shall be responsible for all damage resulting from removal of forms or premature overloading of structural members.
- D. Wood forms for wall openings shall be loosened as soon as possible without damage to the concrete.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. References
 - 2. Submittals
 - 3. Quality Assurance
 - 4. Product Handling

1.2 REFERENCES

- A. American Concrete Institute (ACI)
 - 1. 301 - Specifications for Structural Concrete for Buildings.
 - 2. 117 – Standard Specifications for Tolerances for Concrete Construction and Materials.
 - 3. 315 - Details and Detailing of Concrete Reinforcement.
- B. Concrete Reinforcing Steel Institute (CRSI)
 - 1. Manual of Standard Practice.

1.3 SUBMITTALS

- A. Submittals shall conform to Section 01330.
- B. Submit complete shop drawings and bar lists of all material to be furnished and installed under this Section. Show bar sizes, spacings, locations, and quantities of reinforcing and bending details.
- C. Make shop drawings in accordance with ACI 315 and the CRSI Manual of Standard Practice. Drawings shall show in detail the location, size, spacing, bends, and quantities of each and all reinforcing bars to be placed in the structure. Bars shall have unique identifying labels or marks for each size, length, bend configuration, etc.
- D. Submit product data on threaded dowel inserts.
- E. Submit mill certifications for concrete reinforcement at time of delivery.

1.4 QUALITY ASSURANCE

- A. Comply with ACI 301, except as modified in this Section.

1.5 PRODUCT HANDLING

- A. Deliver reinforcement to the Site bundled, tagged, and marked. Use metal tags indicating bar size, lengths, and other information corresponding to markings shown on placement drawings.
- B. Store reinforcement at the Site in a manner to prevent damage from drainage and accumulation of dirt and excessive rust.
- C. Do not store reinforcement, supports, or equipment on finished slabs.
- D. Store metal bar supports in a weather-proof shelter.

PART 2 – PRODUCTS

2.1 MATERIAL

- A. Reinforcing Bars: Deformed billet steel bars conforming to ASTM A615, Grade 60.

2.2 ACCESSORIES

- A. Bar Supports for Elevated Slabs, Walls, Columns, and Beams: All bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcement in place shall be plastic protected, conforming to CRSI Class 1 protection for bar supports.
- B. Ground Supported Reinforcing: All ground supported reinforcement shall be supported by precast concrete blocks. Precast concrete blocks shall have a minimum compressive strength of 4,000 psi.
- C. Tie Wire: Shall be black annealed wire, 16 gauge or heavier.
- D. Threaded Dowel Inserts: Threaded dowel inserts shall be manufactured of minimum Grade 60 steel and shall be capable of achieving 125 percent of specified yield strength of reinforcement steel for the bar size indicated.

2.3 FABRICATION

- A. Shop fabricate reinforcing steel to required shapes and dimensions.
- B. Do not rebend or straighten reinforcing steel.
- C. Fabricate bars in accordance with the fabricating tolerances given in ACI 315.

PART 3 – EXECUTION

3.1 PLACING

- A. Place reinforcing steel in accordance with ACI 117, the Drawings, approved Shop Drawings, and as specified herein. Notify ENGINEER of any discrepancies or conflicts as soon as they are discovered.
- B. Reinforcing steel shall have the following concrete cover, unless specifically noted differently on the Drawings:
 - 1. Concrete cast against earth 3 inches.
 - 2. All other concrete 2 inches.
- C. Properly position reinforcing steel and wire it together at intersections and supports to ensure against displacement during concrete placing. All reinforcing steel shall be tied to wall forms.
- D. Reinforcing steel for slabs on grade shall be supported by placing precast concrete blocks at all locations where chairs are to be located. Chairs or standees shall be placed over concrete blocks.
- E. Dowels shall be wired in place before placing concrete.
- F. All reinforcing steel must be placed and tied before concrete is placed.
- G. Reinforcing steel embedded in hardened or partially hardened concrete shall not be bent after placing.
- H. Wall chairs shall be placed at the top and bottom of all walls and not greater than 6 feet on center horizontally.
- I. All reinforcement at the time concrete is placed shall be free of mud, oil, or other materials that may adversely affect or reduce the bond.
- J. Chairs and bolsters shall support the reinforcing steel closest to the formed surface. Beam stirrups and column ties shall be supported by chairs.

3.2 SPLICES

- A. Provide reinforcement splices by lapping ends, placing bars in contact, and tightly wire tying. Provide lap splice lengths as shown on the Drawings.
- B. Splices shall be made only as shown on the Drawings or as authorized by the ENGINEER.
- C. Threaded or other approved mechanical bar splices shall be used where shown on the Drawings and may be used elsewhere for the convenience of the CONTRACTOR at no additional cost to the OWNER if specifically requested of and approved by the ENGINEER.

3.3 TOLERANCES

- A. Bars shall be placed to the tolerances indicated in ACI 117.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Furnish and install all cast-in-place concrete and accessories.

1.2 REFERENCES

A. American Concrete Institute (ACI)

1. 301 - Specifications for Structural Concrete for Buildings.
2. 304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
3. 305 - Hot Weather Concreting.
4. 306 - Cold Weather Concreting.
5. 309 - Recommended Practice for Consolidation of Concrete.

B. American Society of Testing materials (ASTM)

1. ASTM C31 – Standard Practice for Making and Curing Concrete test Specimens in the Field.
2. ASTM C33 – Standard Specification for Concrete Aggregates.
3. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
4. ASTM C94 – Standard Specification for Ready-Mixed Concrete.
5. ASTM C143 – Standard Test Method for Slump of Hydraulic Cement Concrete.
6. ASTM C150 – Standard Specification for Portland Cement.
7. ASTM C171 – Standard Specifications for Sheet Materials for Curing Concrete.
8. ASTM C231 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
9. ASTM C260 – Standard Specification for Air-Entraining Admixtures for Concrete.
10. ASTM C309 – Standard Specification for Liquid Membrane-Forming Compounds For Curing Concrete.
11. ASTM C494 – Standard Specification for Chemical Admixtures for Concrete.

12. ASTM C618 – Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for use as a Mineral Admixture in Portland Cement Concrete.
13. ASTM D1751 – Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

1.3 SUBMITTALS

- A. Submittals shall conform to Section 01330.
- B. Submit manufacturer's data for concrete admixtures, liquid curing material, floor joint filler, finishing compounds, and bonding agents.
- C. Submit concrete aggregate test reports and concrete mix designs at least 14 days prior to placement of concrete.
- D. Submit results of concrete strength tests.

1.4 QUALITY ASSURANCE

- A. See Section 01450 for additional requirements.
- B. Comply with ACI 301, except as modified in this Section.
- C. The CONTRACTOR shall hire an independent testing laboratory approved by the ENGINEER to perform the work listed below. All costs for this testing shall be paid by the CONTRACTOR.
 1. Test proposed aggregate.
 2. Design concrete mixes for each type of concrete specified.
 3. Cast concrete cylinders for strength tests.
 4. Test concrete cylinders.
- D. Aggregate Tests
 1. Test aggregates for compliance with ASTM C33.
 2. Test coarse and fine aggregates for alkali-silica reaction. Expansion shall be limited to 0.04% at 2 years per ASTM C 1293.
- E. Concrete Mix Design
 1. Prepare mix designs for each type of concrete specified.
 2. Design concrete mixes in accordance with ACI 301.
- F. Concrete Strength Tests
 1. Mold and cure three 6 inch diameter by 12 inch high specimens from each sample in accordance with ASTM C31. Any deviations from the requirements of ASTM C31 shall be recorded in the test report.

2. Alternatively, if the maximum coarse aggregate size for the concrete mix used does not exceed 1-1/4 inches, 4 test specimens 4 inch diameter by 8 inch high may be cast.
3. Test specimens in accordance with ASTM C39. Two 6 inch diameter or three 4 inch diameter specimens shall be tested at 28 days for acceptance and 1 shall be tested at 7 days for information. The acceptance test results shall be the average of the strengths of the specimens tested at 28 days.
4. Make at least 1 strength test for each 100 cu.yds. or fraction thereof of each mixture design of concrete placed in any 1 day.
5. A copy of the test results shall be furnished to the ENGINEER as soon as available.
6. All costs of concrete cylinder testing shall be paid by the CONTRACTOR.
7. Mold and field cure additional specimens as required in Section 03100 for early form removal.

G. Concrete Slump Tests

1. The CONTRACTOR's testing company will determine slump of concrete from each truck in accordance with ASTM C143.
2. If slump does not meet Specifications, remove batch from work and dispose of off Site.
3. All costs of slump testing will be paid by the CONTRACTOR.

H. Concrete Air Content Tests

1. The CONTRACTOR's testing company will determine air content of concrete from each truck in accordance with ASTM C231.
2. If air content does not meet Specifications, remove batch from work and dispose of off Site.
3. Air content will be tested prior to and after adding mid-range plasticizer.
4. All costs of air content testing will be paid by the CONTRACTOR.

I. Concrete Temperature

1. The CONTRACTOR's testing company will determine temperature of concrete from each truck.

1.5 PRODUCT HANDLING

- A. Do not store forms, shores, reinforcing, equipment, or other material on finished slab surfaces.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIAL

- A. Cement: Conform to ASTM C150, Type I. Provide cement from 1 source of supply.
- B. Aggregate: Conform to ASTM C33. Provide aggregate from 1 source of supply.
- C. Water: Clean potable and free from deleterious amounts of oil, acid, alkali, or other foreign matter.

2.2 ADMIXTURES

- A. Air Entraining Admixture: Conform to ASTM C260.
- B. Water Reducing Admixture: Conform to ASTM C494, Type A.
- C. Mid-Range Water-Reducing Admixtures: Conform to ASTM C494, Type F and contain no chlorides.
- D. Fly Ash: Conform to ASTM C618, Class C or F. Loss on ignition shall be limited to 3 percent maximum.

2.3 MISCELLANEOUS MATERIAL

- A. Burlap-Polyethylene Sheet: Burlap polyethylene sheeting shall consist of burlap weighing not less than 10 oz./linear yard, 40 inches wide impregnated on 1 side with white opaque polyethylene 0.006 inch thick. Sheeting shall conform to ASTM C171.
- B. Liquid Curing Compound: Conform to ASTM C309, Type 1-D, Class B clear or translucent with fugitive dye. Not to be applied to floor slabs.
- C. Expansion Joint Material: Bituminous fiber type conforming to ASTM D1751 with bituminous or paraffin binder.
- D. Water stop: Greenstreak Hydrotite hydrophilic water stop, model CJ-1020-2K, with Leakmaster water-swelling sealant.
- E. Exterior Joint Sealant: 2-parts, self-leveling, polyurethane sealant, Sonolastic SL2 manufactured by Sonneborn, or approved equal.
- F. Adhesive Anchor: Adhesive for anchoring steel reinforcement dowels and threaded rods in concrete shall be a 2 component injected structural adhesive. Provide Hilti RE-500-SD system as manufactured by Hilti Fastening Systems or approved equal.

2.4 CONCRETE MIX PROPORTIONS

- A. Structural Concrete: Concrete for wall repairs and all other applications unless noted otherwise, shall conform to the following minimum requirements:

Coarse aggregate size	ASTM C33 Size No. 67
Coarse aggregate type	Limestone
Minimum compressive strength at 28 days	4,000 psi
Maximum water-cement + pozzolan ratio	0.40
Minimum cement + pozzolan content	564 lb/cu.yd.
Maximum pozzolan (fly ash) content	25 percent of cement + pozzolan content
Slump before adding mid-range	2 inches ± 1 inch
Slump after adding mid-range	6 inches ± 1 inch

PART 3 - EXECUTION

3.1 CONCRETE PRODUCTION

- A. Ready-mixed concrete shall be batched, mixed, and transported in accordance with ASTM C94.
- B. Concrete shall be mixed only in quantities for immediate use. Concrete which has set shall be discarded and shall not be retempered.
- C. Discharge concrete from truck within 60 minutes after cement is added to the mix.
- D. No water shall be added at the site. Slump adjustments shall be made at the plant.

3.2 EMBEDDED ITEMS

- A. All sleeves, inserts, anchors, and embedded items required for adjoining work or for its support shall be placed prior to placing concrete.
- B. All embedded items shall be positioned accurately and supported against displacement.
- C. Voids in sleeves, inserts, and anchor slots shall be filled temporarily with readily removable material to prevent the entry of concrete into the voids.
- D. Waterstops substrate shall be smoothed as needed for complete adhesion of waterstop. Adhere with water-swelling adhesive and lap as per manufacturer's recommendations.

3.3 PREPARATION BEFORE PLACING

- A. Formwork shall be completed and all reinforcement and embedded items shall be secured in place.
- B. All snow, ice, and mud shall be removed prior to placing concrete.
- C. Do not place concrete on frozen ground.

- D. Do not place concrete on ground with standing water or when upper 2 inches of ground is saturated.
- E. Do not place concrete during rain, sleet, or snow.
- F. Placement time will be critical as access to the site is difficult. CONTRACTOR shall obtain concrete from the closest acceptable batch plant to keep placement time less than 90 minutes.

3.4 CONCRETE CONVEYING

- A. Concrete shall be handled from the mixer to the place of final deposit as rapidly as practical by methods, which will prevent segregation or loss of ingredients.

3.5 CONCRETE DEPOSITING

- A. Deposit concrete continuously or in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the Section.
- B. Place concrete at such a rate that the concrete which is being integrated with fresh concrete is still plastic.
- C. Concrete which has partially hardened or has been contaminated by hardened materials shall not be deposited.
- D. Remove rejected concrete from the Site.
- E. Deposit concrete as nearly as practicable in its final position to avoid segregation due to handling or flowing.
- F. Free fall of concrete shall not exceed 5 feet. Use chutes equipped with hopper heads for placing where a drop of more than 5 feet is required.

3.6 COLD WEATHER PLACING

- A. Do not place concrete when the air temperature is less than 40 degrees F without the specific approval of the Engineer.
- B. Cold weather concrete work shall conform to all requirements of ACI 306.1, except as modified by the requirements of these Contract Documents.
- C. Concrete shall not be placed against any frozen substrate, including subgrade soils and surfaces of formwork.
- D. Concrete shall not be placed around any embedment, including reinforcing steel that is at a temperature below freezing.
- E. The temperature of the concrete delivered at the Site shall conform to the following limitations:

Minimum Concrete Temperature

Air Temperature	< 12 Inches Thick	12 to 36 Inches Thick
Above 30 degrees F	60 degrees F	55 degrees F
0 to 30 degrees F	65 degrees F	60 degrees F
Below 0 degrees F	70 degrees F	65 degrees F

- F. If water or aggregate is heated above 100 degrees F, the water shall be combined with the aggregate in the mixer before cement is added. Cement shall not be mixed with water or with mixtures of water and aggregate having a temperature greater than 100 degrees F.
- G. When the mean daily temperature is less than 40 degrees F, the temperature of the concrete shall be maintained between 50 and 70 degrees F for the required curing period.
- H. Arrangements for heating, covering, insulation, or housing the concrete work shall be made in advance of placement and shall be adequate to maintain the required temperature without injury due to concentration of cold or heat. Protection shall remain in place for a minimum of 3 days.
- I. Combustion heaters shall not be used during the first 24 hours, unless precautions are taken to prevent exposure of the concrete to exhaust gases.
- J. Once the cold weather concrete protection is removed, concrete curing must be continued for the remainder of the 10-day curing period.

3.7 HOT WEATHER PLACING

- A. Comply with ACI 305 when hot weather conditions exist.
- B. Maintain concrete temperature at time of placement below 90 degrees F.
- C. When the temperature of the steel is greater than 120 degrees F, steel forms and reinforcement shall be sprayed with water prior to placing concrete.
- D. Keep all surfaces protected from rapid drying. Provide windbreaks, shading, fog spraying, sprinkling, ponding, or wet covering in advance of placement.

3.8 CONSOLIDATION

- A. Consolidate all concrete in accordance with provisions of ACI 309.
- B. Consolidate each layer of concrete immediately after placing by use of internal concrete vibrators. Maintain a frequency of not less than 8,000 vibrations per minute for each internal vibrator.
- C. Provide adequate number of units and power source at all times. Use a minimum of 2 vibrators for all Work and maintain spare units to ensure adequacy.
- D. Insert the vibrator so as to penetrate the lift immediately below the 1 being placed. Do not insert the vibrator into lower courses which have begun to set.

- E. Spacing between insertions of the vibrator shall generally be from 12 inches to 18 inches and shall not exceed twice the radius of action as shown in ACI 309 or 18 inches.
- F. Do not use vibrators to transport concrete inside the forms.
- G. Vibration shall be adequate and properly carried out to minimize entrapped air and surface voids on formed surfaces.

3.9 FINISHING FORMED SURFACES

- A. Smooth Form Finish: Provide a smooth formed surface to all formed surfaces not exposed to view, unless otherwise noted in Paragraph B. Smooth formed finish shall consist of the following:
 - 1. Construct formwork in accordance with Section 03100.
 - 2. Patch all tie holes and defects larger than 1/8 inch in diameter and/or 1/8 inch deep.
 - 3. Remove all fins, seams and concrete "buttons" protruding more than 1/16 inch.
- B. Special Form Finish: Provide a special form finish to all formed surfaces exposed to view:
 - 1. Provide a smooth form finish in accordance with Paragraph 3.11.A.
 - 2. Thoroughly clean concrete surface and remove all dirt, loose mortar particles, paint, films, protective coatings, efflorescence, and other foreign material.
 - 3. Dampen surface with clean water just prior to application of finishing compound.
 - 4. Mix 1-part bonding agent to 3-parts clean water for mixing liquid.
 - 5. Mix concrete finish compound with mixing liquid as specified by the manufacturer.
 - 6. Apply first coat to concrete with brush at 2 lbs. per square yard after the first coat has set.
 - 7. Apply second coat to concrete with brush at 2 lbs. per square yard after the first coat has set.
 - 8. When the second coat has set, float it to a uniform texture with a sponge float.
 - 9. Prepare 3 test samples of various textures for approval by the ENGINEER. Each sample shall be approximately 6 feet by 6 feet in size and located on an unexposed wall surface as directed by the ENGINEER.

3.10 CURING

- A. Immediately after placement, all concrete shall be damp cured for a minimum of 7 days.
- B. All slabs shall be covered with approved burlap-polyethylene film and kept in place throughout the curing period.

- C. Walls, beams, columns, and other formed surfaces shall be covered with burlap-polyethylene film and kept continuously wet for 7 days.
- D. All burlap-polyethylene film shall be adequately anchored at the edges to prevent moisture loss.
- E. Rewet all slab surfaces at least once a day during the curing period.
- F. Apply curing compound after completion of wet cure.

3.11 PATCHING

- A. Repair honeycomb and other defective areas, fill surface voids, and fill form tie holes and similar defects in accordance with ACI 301. Defects and bug holes 3/8" and larger shall be filled.
- B. Repair surface defects as soon as practical after removal of forms and before application of any curing compound.
- C. Reinforce or replace deficient work as directed by the ENGINEER and at no additional cost to the OWNER.

3.12 CLEAN UP AND DISPOSAL

- A. Upon completion and prior to any painting, all exposed or painted concrete surfaces shall be thoroughly cleaned of all concrete spatters, form oil, or other foreign material detrimental to appearance or painting.
- B. All excess concrete debris remaining after completion of placement and form removal shall be removed from the Site and disposed of in a proper and legal manner.

END OF SECTION

SECTION 03600

CONCRETE REPAIR

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Cleaning existing concrete, surface preparation for concrete repair, parging material, poly-urethane injection grout.
- B. Submittals
- C. Submittals shall conform to Section 01330.
- D. Submit manufacturer's data for injection material and parging material.

1.2 PROJECT HANDLING

- A. Deliver materials in original, unopened containers with labels showing product name.
- B. Materials delivered in damaged or opened containers will not be accepted.
- C. Store and protect materials according to manufacturer's directions.

PART 2 – PRODUCTS

2.1 EQUIPMENT

- A. Surface preparation shall be done using mechanical methods. No preparation of the surface by chemicals will be allowed.
- B. High pressure water blasting equipment (3,000 to 5,000 psi) shall be capable of removal of dirt and loose particles.

2.2 INJECTION MATERIALS

- A. Injection material shall be hydrophilic polyurethane. Provide SikaFix HH resin.
- B. Parge material shall be Sikatop 122 plus or approved equal.
- C. Ports shall be plastic or stainless steel.

PART 3 – EXECUTION

3.1 CRACK INJECTION

- A. Remove dust, laitance, grease, impregnations, and disintegrated materials by mechanical means. Concrete surface must be clean and sound.
- B. Apply parging material and allow to cure.

- C. Install injection ports.
- D. Mix injection grout in accordance with manufacturers' specifications.
- E. Pressure inject the horizontal wall crack. Follow all manufacturers' recommendations.

3.2 CLEAN UP

- A. CONTRACTOR shall remove all loose concrete and injection grout from the Site and leave the area broom clean.
- B. Grind off injection ports to 1/2" below surface.
- C. Patch surface with parging material, following manufacturer's directions.

END OF SECTION

SECTION 09900

PAINTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. It is the intent of this Section that all painting necessary to result in a complete, finished appearing facility be accomplished. As the work of this Section, prepare surfaces that are to be painted and furnish and apply paint materials. Paint schedules follow the text of this Section and define the surface preparation and coating systems required to paint the various types of surfaces that are to be painted. The Paint Application Table below identifies the areas to receive the paint systems specified in the paint schedules. For items or areas not listed in the Paint Application Table, consult the ENGINEER for the proper system to be used. Exclusion from the Paint Application table does not necessarily mean that an item or area does not require painting.

B. Acceptable manufacturers: Tnemec or equivalent by Carboline. No substitutions.

C. Paint Applications

Paint manufacturer/representative shall visit site and confirm product compatibility with application.

Schedule M1: Submerged Metal

Paint all submerged metal provided or refurbished for the project including, but not limited to: turbine housing and wicket assembly.

1 color.

NOTE: The specified coating system shall be used as the basis of bidding; however, before making a submittal or ordering materials, the CONTRACTOR shall have the manufacturer representative visit the site and examine the existing areas to be painted to finalize coating recommendations.

D. Prime and finish painting, regardless of the location in which the work is performed, shall conform to all requirements of this Section. Coordinate painting with the fabrication of components and with the work of other trades to ensure the full and correct application of paint materials.

1.2 DEFINITIONS

A. For the purposes of this Section, the following definitions apply: "Exposed to View" means all surfaces in the final work that could be seen from any vantage point from any height. "Paint" means all pretreatment, prime, intermediate, and final coatings specified herein including clear, translucent, and opaque materials.

1.3 QUALITY ASSURANCE

A. Use only qualified journeyman painters for the mixing and application of paint on exposed surfaces. In the acceptance or rejection of installed painting, no allowance will be made for lack of skill on the part of painters.

- B. Apply paints following the recommendations in the "Applications Manual for Paint and Protective Coatings" published by McGraw-Hill.
- C. See Section 01450 Quality Control for paint testing and inspection requirements.

1.4 SUBMITTALS

- A. Prior to ordering and delivering paint materials to the project site, submit the following:
 - 1. Manufacturer literature demonstrating compliance with these Specifications and indicating paint formulation, rate of coverage, recommended uses and recommended application method.
 - 2. Color chips for the full range of colors available in each product.

1.5 PRODUCT HANDLING

- A. Deliver all paint materials to the job site in their original unopened containers with all labels intact and legible at time of use. Store only the approved materials at the job site. Store them in a suitable and designated area restricted to the storage of paint materials and related equipment. Use all means necessary to ensure the safe storage and use of paint materials and the prompt and safe disposal of waste. Store volatile solvents, rags and cleaning materials in a well ventilated area.
- B. Use all means necessary to protect paint materials before, during, and after application and to protect the installed work and materials of all other trades. In the event of damage, immediately make all repairs and replacements necessary at no additional cost to the OWNER.

2.0 PRODUCTS

2.1 PAINT MATERIALS

- A. Provide paint materials in accordance with the paint schedules that follow the text of this Section.
- B. All paint materials for each paint system shall be the products of a single manufacturer. All paint materials and equipment shall be compatible in use: finish coats shall be compatible with prime coats, prime coats shall be compatible with the surface to be coated and all tools and equipment shall be compatible with the coating to be applied. Thinners, when used, shall be only those thinners specifically recommended for that purpose by the manufacturer of the material to be thinned.
- C. Furnish finish paint in the colors selected by the OWNER from the manufacturer's standard available colors (a minimum of 12 colors must be available for each finish paint requiring color choice).

3.0 EXECUTION

3.1 GENERAL

- A. At no time during the work shall open containers of paint, thinners, solvent or cleaners be placed directly over the Huron River. Any paint, thinner, solvents or cleaner spilled within the cofferdam area shall be cleaned up immediately. In the event of any discharge of any fuel, chemical, lubricant, paint thinner, solvent or cleaner into the Huron River, the OWNER shall be notified immediately.
- B. Prior to beginning the work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this application may properly commence. Verify that paint finishes may be applied in strict accordance with all pertinent codes and regulations and the requirements of these Specifications. In the event of discrepancy, immediately notify the ENGINEER. Do not proceed with application in areas of discrepancy until all such discrepancies have been fully resolved. Application of paint materials shall be deemed to indicate acceptability of the existing surface conditions.

3.2 SURFACE PREPARATION

A. General

- 1. Prior to beginning surface preparation and painting operations, completely mask, remove, or otherwise adequately protect all hardware, accessories, machined surfaces, plates, lighting fixtures, and all work of other trades that are not to receive the paint coating. Before applying paint, thoroughly clean and prepare all surfaces according to the specified surface preparation method. Schedule all cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- 2. Spot prime all necessary areas prior to beginning field painting.
- 3. Stripe coat the primer and the 1st finish coat.

B. Preparation of Metal Surfaces

- 1. Prepare metal surfaces for painting by following the method indicated on the appropriate paint schedule. Preparation methods are referenced to the Steel Structures Painting Council (SSPC) Specifications. Do not prepare metal for painting when the relative humidity is higher than 85% or the metal is less than 5°F above the dew point. After surface preparation, thoroughly clean all surfaces of any remaining dirt, oil and grease and leave it ready to receive prime paint.
- 2. No abrasive blasting will be allowed in the work space. Surface preparation must be by mechanical profiling method.

3.3 PAINT APPLICATION

- A. Apply paint in accordance with paint schedule requirements, the cited reference, all codes and regulations, and the recommendations of the paint manufacturer. Apply prime paint to metal surfaces within 24 hrs after surface preparation. Do not apply paint in areas where dust is being generated.

- B. Do not apply paint when the surrounding air temperature as measured in the shade is below 40°F or when the temperature of the surface to be painted is below 35°F. Do not apply paint when it is expected that the relative humidity will exceed 85% or that the air temperature will drop below 40°F within 18 hrs after the application of paint. Dew or moisture condensation should be anticipated and if such conditions are prevalent, delay painting until certain that the surfaces can be kept above the dew point. Follow all additional environmental limitation requirements of the paint manufacturer.
- C. Paint material mil thickness and numbers of coats that are indicated in the paint schedules are based on brush or roller application. Spray application of paint materials will be allowed in the field only for areas or surfaces that are very difficult to paint with brush or roller. Field spray application must be approved by the ENGINEER before its initiation. For areas that are spray painted, apply as many coats as necessary to achieve specified mil thickness.
- D. Allow sufficient drying time between coats of paint. During adverse weather, extend length of drying time as recommended by the paint manufacturer.
- E. Prior to applying each paint coating after the first, check mil thickness of previously applied coating(s). Correct for insufficient paint thickness by increasing the mil thickness of subsequent applications, if allowed by the paint manufacturer or by applying additional coatings to provide the specified paint thickness.
- F. Spot sand between coatings to remove paint defects visible to the unaided eye from a distance of five feet.

3.4 CLEAN UP

- A. During the progress of the work, do not allow the accumulation of empty containers or other excess items except in areas specifically set aside for that purpose. Following completion of painting in each area, promptly remove all masking and temporary protection. After paint has dried, reinstall all items removed for painting. Upon completion of this portion of the work, visually inspect all surfaces and remove paint and traces of paint from surfaces not scheduled to be painted.

SCHEDULES FOLLOW

PAINT SCHEDULE M1

SERVICE: SUBMERGED METAL

Surface Preparation

SSPC SP 11 – Power Tool Cleaning

Paint Manufacturer	Application	Product Name	Product Type	No. Of Coats	Dry Mils/ Coat	Comments
Tnemec		Series 1 Omnithane		1	2.5 – 3.5	
Tnemec		Series 20 Potapox		2	3.0 – 5.0	Black

TOTAL SYSTEM THICKNESS 8.5-13.5

Notes:

1. The specified coatings shall be the basis of bidding. Actual system may vary depending on the recommendations of the coatings representative based on field visit.
2. All edges and corners shall be stripe coated. Specified millage does not include stripe coating.

SECTION 15500

OVERHAUL OF TURBINE EQUIPMENT

PART 1 – GENERAL

1.1 SCOPE

- A. Under this Section the CONTRACTOR shall refit the existing Barton turbine with new components and equipment as noted. The work shall include furnishing and installing new parts, as well as disassembly, removal, rebuilding, and reinstallation of existing turbine parts. The CONTRACTOR shall be responsible for purchasing, unloading, moving, storing, assembling, installing, and testing of all equipment specified herein, as well as handling, storing and installing parts or equipment that may be supplied by the OWNER.
- B. The work shall include but not be limited to items listed in Section 01010, Summary of Work, Section 1.1.
- C. The CONTRACTOR shall coordinate the work covered by this Section of these Specifications with the work covered by other Sections, to provide a complete and workable installation ready for startup as scheduled and when accepted by the OWNER.
- D. As required, the CONTRACTOR shall provide for the placing, shimming, anchoring, temporary support of shafts or other equipment, grouting, cleaning, lubricating, assembling, and adjusting of the equipment. The CONTRACTOR shall provide all supervision, labor, tools, equipment, and materials for all phases of the job as required to perform the installation of equipment and accessories furnished.
- E. The CONTRACTOR shall furnish, install, and field check the functioning of each specified element, providing supervision of the manufacturer's representative when and as required, to assure proper installation and satisfactory operation of the equipment.

1.2 SUBMITTALS

- A. The CONTRACTOR shall verify all dimensions and take such field measurements as may be required to execute the work and shall assume full responsibility for figured dimensions of this work. All field measurements and verifying of field conditions shall be done before submitting Shop Drawings to the ENGINEER for review.
- B. All Shop Drawings shall be submitted in accordance with the Section 01330 of these Specifications.
- C. The operating and instruction manuals shall include the following information:
 - 1. List of all equipment and/or components furnished, including manufacturer model numbers, correct pressure and temperature settings, alarm points, operating ranges, etc.
 - 2. Manufacturer's standard literature of equipment and/or components, together with detailed specification sheets.
 - 3. For equipment: installation, operation, assembly, disassembly and maintenance procedures, including detailed written instructions.

PART 2 – PRODUCTS

2.1 OWNER-FURNISHER PARTS

- A. The CONTRACTOR shall inspect OWNER-furnished parts and verify size and type for each application before installing.
- B. All needed parts not specifically called out shall be assumed to be incidental to the CONTRACTOR's scope. Where not otherwise shown, parts shall be replaced in kind with existing. Note: Replacement in kind will not absolve the requirement for submittals as detailed in Section 1.2 above.

2.2 STANDARDS

- A. Materials used in the work shall be new, of high commercial quality, and selected for the purpose and service conditions applicable according to best practice in the industry.
- B. All materials shall be to American standards such as ASTM, AISI, ANSI, AGMA, or equivalent alternate recognized standard. The CONTRACTOR shall state the materials proposed for all of the principal parts listed along with the equivalent American standard. The requirements regarding properties, workmanship, quality and testing specified in the American standards shall apply for all equivalents proposed.
- C. Unless noted otherwise, system tests shall be in accord with ASME PTC 29-2005 "Speed-Governing Systems for Hydraulic Turbine-Generator Units".

2.3 GENERATOR AND SPEED INCREASER COMPONENTS

- A. As required, gears and bearings shall be replaced in kind, matching original manufacturer's specification, and in addition shall meet the minimum requirements of B and C below.
- B. Bearings shall have an L10 life of 100,000 minimum under the worst loading conditions. Bearings will also be capable of being operated continuously without injury at any speed from half rated speed to 110 percent rated speed, for one-half hour at any speed from 110 percent rated speed to the maximum turbine runaway speed and for at least one-half hour at any speed as low as 10 revolutions per minute. Bearing replacements shall include oil seal collars (inner and outer), oil rings locknuts and lockwashers applicable.
- C. Gears shall have an AGMA service factor of 1.5 minimum and shall meet AGMA 390, quality class 11. Replacement shall include keys, lockwashers or other fasteners as required. Type and material shall match original component.

PART 3 – EXECUTION

3.1 GENERAL

- A. The CONTRACTOR shall provide qualified personnel for installation of the equipment and components designated by this Contract.
- B. The CONTRACTOR shall insure that this work is done in conformance within the applicable codes, standards and recommendations of equipment and component manufacturers.

- C. No alterations to the buildings structure or enclosure, such as cutting or gas torch burning, shall be made by the CONTRACTOR as a means of correcting deviations or errors in his own work, unless such alterations are specifically authorized by the ENGINEER after his review.
- D. Miscellaneous items may be anchored to concrete, where approved by the ENGINEER by means of adhesive anchors. In general, the anchor material shall be stainless steel unless particular connections require a different material (e.g., high-strength bolts). Materials shall be submitted for review.
- E. The CONTRACTOR shall thoroughly lubricate all equipment and fill all lubrication systems as required for a complete running system.
- F. The CONTRACTOR shall be responsible for providing all equipment necessary for installation including cranes, jacks, temporary electrical service, pumping, etc. The CONTRACTOR may use the existing crane and trolley within the powerhouse.
- G. Any special tools required for proper maintenance shall be furnished, tagged, and placed in storage for plant use at start-up.
- H. Wiring, conduits, piping and other connections to the generator, speed increaser and other units to be carefully removed, protected and stowed on site for the duration of the project.
- I. The CONTRACTOR shall install OWNER-furnished parts as required, and shall provide hoses, piping, wiring and all secondary parts and equipment as needed to install OWNER furnished parts.
- J. Unless otherwise noted in these Specifications, all components, including for the speed increaser and generator, shall be replaced in-kind, as per the original specifications of the equipment manufacturer. Where the part manufacturer recommends a revision, this shall be submitted for review. The CONTRACTOR shall make a submittal for all replacement components for review by the ENGINEER. Submittal shall include material, size and type, industry standards, lifespan ratings, etc.

3.2 EQUIPMENT INSPECTIONS

- A. Before the hydroturbine is taken out of service, the CONTRACTOR shall perform the following operational field inspections (turbine watered and operating), and shall document findings:
 - 1. Wicket gates: Operation of gates and ancillary systems.
 - 2. Runner: Operation of runners, servo and ancillary systems.
 - 3. Vibration analysis. (This testing shall be conducted in the same locations and under the same load conditions as indicated in the Kiser report in the appendix.)
- B. The CONTRACTOR shall perform the following inspections (hydro shut down and dry) and document findings:
 - 1. Generator. See section 3.4 below.
 - 2. Gear Box/Speed increaser. See section 3.5 below.

3. Runner. Document blade clearances. Remove nose cone and inspect link arms.
4. Wicket gates. Document clearances. Inspect wicket links and bearings.
5. Runner bearing. Disassemble, measure and document clearances.

3.3 MECHANICAL REPAIRS AND REPLACEMENTS

- A. The CONTRACTOR shall perform the following equipment/component repairs:
1. Generator. See Section 3.4 below.
 2. Speed increaser. See Section 3.5 below
 3. Runner bearing. Replace with new.
 4. Lower seal. Replace with new.
 5. Wicket gate hydraulic actuator: rebuild cylinder and associated pivot bearings.
 6. Wicket blades: Repair cavitation pitting (1-inch diameter each). Use approved welding rods compatible with existing material. Grind smooth.

3.4 GENERATOR

- A. The CONTRACTOR shall remove the generator and send out for refurbishment. Scope includes:
1. Completely disconnect the unit from electrical and control circuits.
 2. Disconnect disc brake system and related piping and wiring as needed.
 3. Remove high speed shaft and couplings.
 4. Unbolt unit and remove from mounting platform.
 5. Ship unit to refurbishment facility.
- B. The CONTRACTOR's refurbishment facility shall complete the following:
1. Open the unit casing and perform inspection.
 2. Report findings to ENGINEER on condition and recommendations for refurbishment.
 3. Clean stator and rotor windings, fans ventilation grilles, and other components as needed inside the case.
 4. Inspect brushes and replace as required.
 5. Replace all bearings.

6. Perform validation testing.
 7. All related work necessary to provide a complete and functional overhaul of the equipment.
- C. The CONTRACTOR shall completely reinstall the generator following refurbishment. Scope includes the following:
1. Receive generator and unload. Store in hydro plant.
 2. Reinstall unit.
 3. Set high-speed shaft with new couplings and align.
 4. Install new brake components and make connections.

3.5 SPEED INCREASER

- A. The CONTRACTOR shall remove the speed increaser and send out for refurbishment. Scope includes:
1. Completely disconnect the unit from control circuits. Remove water and lubrication piping as required.
 2. Disconnect and remove runner blade servo.
 3. Drain and dispose of oil.
 4. Install support for turbine shaft.
 5. Remove decking at generator level.
 6. Unbolt and remove generator support.
 7. Unbolt and remove speed increaser.
 8. Ship to refurbishment facility.
- B. The CONTRACTOR's refurbishment facility shall complete the following:
1. Open the unit casing and perform inspection.
 2. Report findings to ENGINEER on condition and recommendations for refurbishment.
 3. Replace all bearings and gears.
 4. Change oil and filters.
 5. Replace all seals, shims and gaskets. Determine source of leak and repair.

6. Install new speed increaser hardware.
 7. Perform validation testing.
 8. All related work necessary to provide a complete and functional overhaul of the equipment.
- C. The CONTRACTOR shall completely reinstall the speed increaser following refurbishment. Scope includes the following:
1. Receive speed increaser and unload. Store in hydro plant as needed.
 2. Reinstall unit and connect turbine shaft. Align shaft.
 3. Install new hydraulic return line and other connections as needed on servo head.
 4. Refill with oil.
 5. Install generator support and grating.

3.6 ADDITIONAL MECHANICAL REPAIRS AND REPLACEMENTS

- A. The CONTRACTOR shall perform the following equipment/component repairs and replacements:
1. Runner servo: New seals, O-rings and flexible lines.
 2. Runner rebuild:
 - a. Blade bearings
 - b. Link-arm bearings
 - c. Cam arm refurbish
 - d. Crosshead/trunnion refurbish
 - e. New fasteners
 3. Wicket rebuild:
 - a. New bearings and O-rings
 - b. Spring link inspect and replace
 - c. Inspect spherical bearings
 - d. Clean flume and coat to make clearance spec
- B. The CONTRACTOR shall provide new seals, fasteners and O-rings for the above work.

3.7 STARTUP, TESTING AND COMMISSIONING

- A. Prior to watering the system, the CONTRACTOR shall:
1. Completely remove debris from all water passageways. Sweep surfaces clean and power-wash, preventing wash water from entering the wicket assembly or other machinery;
 2. Flush all piping systems connected to the turbine operation.
 3. A final checkout shall be made of the operational readiness of the generator, turbine, and associated auxiliaries.
 4. Verify operation of all ancillary equipment, including: valves, seal water and bearing water mechanical, hydraulic actuation, electrical and control, etc. All water supply lines, including strainers, shall be checked to be sure of proper flow to the various parts of the unit.
 5. All equipment including gauges, instruments, controls, valves, lubricating devices, flow indicators, filters, pumps, etc., shall be carefully checked for proper operation before starting the unit. All gauges, instruments, controls, temperature devices, relays, meters, and associated electrical and mechanical devices shall be calibrated as required. Oil pumps and piping shall undergo a 24-hr period of operation and an inspection to be sure of correct performance and the absence of leaks. The intake, drains, runner, discharge ring, wicket gates, inlet, spiral case, runner chamber, draft tube, speed increaser and generator shall be carefully inspected to be certain that all foreign matter has been removed.
 6. Perform an operation test on all relays, indicators, thermometers, speed switches, resistance temperature detectors, and flow switches to verify correct calibration, adjustment, and operational readiness.
 7. Pressure test piping systems.
 8. Check timing and operation of wicket gates and related flow control equipment.
 9. Check operation of runner servo.
 10. Perform final check of waterway and hydro equipment to ensure there are no loose bolts, tools or equipment.
- B. As part of Start Up, Testing and Commissioning, CONTRACTOR shall prepare a record of all efforts. Information shall be organized and bound in a 3-ring binder with a Table of Contents and divider pages. Record shall include:
1. All parts, model numbers, manufacturers, cut sheets, etc.
 2. Photographs of all work and parts.
 3. All measurements pre- and post- repair work.

4. All test results pre- and post- repair work.
 5. Any other information used to document the project.
- C. The CONTRACTOR shall provide all necessary personnel to perform operating functions during start-up and initial operation. The OWNER's operating staff will witness all operating functions during start-up and initial operation, and will operate gates, valves, and breakers.
1. The required instrumentation for testing shall be provided by the CONTRACTOR.
 2. The CONTRACTOR will establish a checkoff list procedure in preparation for starting the unit.
 3. The OWNER and ENGINEER will review the proposed testing program and may make suggestions as necessary. The CONTRACTOR shall revise the proposed testing program to include the ENGINEER's comments.
- D. Start-Up, Testing and Commissioning. This work shall be performed by Utilities Instrumentation Services (UIS), out of Dexter, Michigan. CONTRACTOR shall hire, pay for, coordinate and oversee the services of UIS.
1. Before watering the hydroturbine, perform and document the following tests according to ASME PTC 29-2005:
 - a. Droop
 - i. Permanent
 - ii. Temporary
 - b. Deadband and deadtime
 - i. Speed
 - ii. Position
 - iii. Power
 - c. Stability index
 - i. Governing speed band
 - ii. Governing power band
 - d. Step response
 - e. Gain
 - i. Proportional
 - ii. Integral
 - iii. Derivative

- f. Setpoint adjustment
 - i. Range of adjustment
 - ii. Ramp rate

2. Initial No-Load Run

- a. The first operation after watering the unit and intake will be a no-load run to check the shaft runouts and bearing temperatures and to run in the bearings. The CONTRACTOR shall shut down the unit in order to make any desired adjustments or at the request of the OWNER. In some cases, unwatering and inspecting of internal turbine parts or water passages may be required.
- b. During the no-load run, the following checks and adjustments shall be made:
 - i. Adjustment for operation of gate control system timing at rated speed.
 - ii. Operation of starting and stopping controls including emergency shut-down devices.
 - iii. Operation of speed switches.
 - iv. Setting of all devices such as thermometers, pressure gauges, electric indicating instruments, and other similar devices.
 - v. Strainers shall be checked frequently and kept clean.
 - vi. Generator rotor balancing and synchronization.
 - vii. Automatic start-stop control sequencing.
 - viii. Normal operation of remote control.

3. Load Run

- a. After the unit has been synchronized and connected to the electrical system, incremental load tests shall be performed with load increased in small steps and with observations of temperature rise and of the operation of the equipment. When full load has been reached, it shall be maintained for 8 hrs to allow a careful check of temperature rise of bearings and generator windings, observations of general unit operation, and make any adjustments necessary to assure continued successful operation.
 - i. Record wicket opening, runner blade pitch, and speed at the following generation levels:
 - a) 100 kW
 - b) 150 kW

- c) 200 kW
- d) 450 kW
- e) 600 kW
- f) Full

4. Load Rejection Testing

- a. Startup and place unit on-line at speed-no-load.
- b. Allow bearing temperatures to stabilize.
- c. Apply load incrementally as per manufacturer recommendation for unit. Suggested increments as follows:
 - i. 100 kW
 - ii. 150 kW
 - iii. 300 kW
 - iv. 450 kW
 - v. 600 kW
 - vi. Full.
- d. At each successive increment, after bearing temperatures have stabilized, reject load by opening generator breaker.
- e. Record wicket open, runner blade position, headwater and tailwater elevations before each load rejection.
- f. At each stage, check and record: shaft runouts, governor response, and transients (hydraulic and electric). This information shall be used to determine whether or not to initiate the next level of the test. Initiate successive tests only if the lower level tests have been completed and provided results satisfactory to the City and the ENGINEER.

5. Defects and Inadequacies

- a. Any defects or inadequacies uncovered as a result of the start-up and commissioning tests or the performance tests specified shall be corrected and tests continued until the entire testing program is completed and the equipment found satisfactory by the OWNER. All defects and inadequacies found during the testing program shall be corrected by the CONTRACTOR at no cost to the purchaser, provided such defects are within the CONTRACTOR's responsibility as defined herein.

- C. After the hydroturbine is returned to service, the CONTRACTOR shall perform the following operational field inspections (turbine watered and operating), and shall document findings:
1. Wicket gates: Operation of gates and ancillary systems.
 2. Runner: Operation of runners, servo and ancillary systems.
 3. Vibration analysis. (This testing shall be conducted in the same locations and under the same load conditions as indicated in the Kiser report in Appendix C.).

END OF SECTION

SECTION 16000

ELECTRICAL GENERAL PROVISIONS

PART 1 – GENERAL

1.1 REFERENCE TO GENERAL CONDITIONS

- A. The requirements of the General Conditions shall be reviewed for their application to the work within the Electrical Division.

1.2 WORK INCLUDED

- A. The work included in this Division consists of providing all labor and material required for the installation of the complete electrical system, ready for operation.
- B. The work shall include the following:
 - 1. All wiring and equipment for instrumentation and controls;
 - 2. All items incidental to and/or required to disconnect the generator;
 - 3. 120 volt power to control equipment if required;
 - 4. Building and equipment grounding;
 - 5. Assistance to UIS on electrical system and instrumentation and control start-up and testing.
 - 6. Associated incidental wiring with raceways and conductors which is not shown on the Plans will be required with, but not limited to, the following equipment specified under separate sections:
 - a. Instrumentation and Control.
 - b. Connectivity by UIS scope of services.

1.3 CHARACTER OF WORK

- A. The work shall be done in a first-class and workmanlike manner by skilled tradesmen and shall be complete in all details. It shall be executed so that the installation conforms and accommodates itself to the building structure, facilities, equipment and usage.

1.4 MATERIALS

- A. All materials and equipment shall be new and, to the extent possible, standard products of the same manufacturer for similar equipment. Equipment or material not specifically identified shall conform to the general standard of quality established herein.
- B. All materials and equipment shall be listed and labeled by a nationally recognized testing laboratory.
- C. All mounting hardware installed outdoors, in wet locations, or in contact with concrete shall be stainless steel.

1.5 PERMITS

- A. The CONTRACTOR shall obtain and pay for all permits and certificates of inspection for work herein specified. The cost of such permits and certificates shall be included in the CONTRACTOR's bid price.

1.6 LAWS, ORDINANCES, REGULATIONS

- A. The CONTRACTOR shall comply with, and all work and materials shall conform to, the requirements of all applicable federal, state and local laws, ordinances, regulations, as well as the rules and standards of the National Board of Fire Underwriters.

1.7 TEMPORARY CONSTRUCTION POWER

- A. The CONTRACTOR shall provide facilities for temporary light, power, and heat as necessary and as indicated under the General Conditions.
- B. Temporary wiring shall be removed as soon as permanent wiring is completed and the service connected.
- C. If additional power or current characteristics are required, the CONTRACTORS requiring same shall pay for providing this service.

1.8 RECEIPT OF PORTABLE AND DETACHABLE PARTS

- A. All portable and detachable portions of the installation, such as keys, etc., shall be retained. At the completion of the work, they shall be turned over to the OWNER and itemized receipts obtained.

1.9 SHOP DRAWINGS

- A. Shop Drawings shall be prepared as defined in the General Conditions for all equipment supplied under Division 16.00, Electrical.

PART 2 – INSTALLATION

2.1 FIELD MEASUREMENTS

- A. The CONTRACTOR shall make all necessary field measurements where electrical installations are involved to insure the ability to execute the work.
- B. Should interferences occur which will necessitate changes, the ENGINEER shall be notified for his review of the changes before proceeding with the work.

2.2 COORDINATION OF WORK

- A. The CONTRACTOR shall coordinate his work with that of subcontractors on the job.
- B. The CONTRACTOR shall check with the ENGINEER before placing equipment installed in masonry walls and partitions.
- C. The CONTRACTOR shall install items or material used in connection with equipment in accordance with supplier's requirements and diagrams.

2.3 DEMOLITION

- A. The CONTRACTOR shall remove and/or relocate necessary to accomplish the installation and the of the turbine.
- B. Equipment, materials, and devices removed shall remain the property of the OWNER and shall be stored at locations as directed by the ENGINEER. Such items shall only be reused if specifically designated on the Drawings.

2.4 POWER INTERRUPTIONS

- A. The CONTRACTOR shall coordinate with the ENGINEER any interruptions to power. Every effort shall be made to give enough advance notice to allow proper scheduling of the affected work activities.
- B. The CONTRACTOR shall provide temporary wiring or power generation to minimize the duration of electrical interruptions and to keep critical load energized.

2.5 CONCRETE WORK

- A. Concrete work for foundations, manholes, concrete encased conduit, etc., shall be provided by the CONTRACTOR and performed as shown on the Plans and shall conform to the Concrete Work Section of these Specifications.

2.6 LEGEND PLATES

- A. Electrical equipment shall be equipped with laminated plastic legend plates with black lettering engraved on white background. The legend plates shall be 1-1/4 inches high and 3-1/2 inches wide and shall be attached to the equipment by means of stainless steel machine screws. The plates shall be approximately 3/32-inch thick and shall have letter sizes and legends as reviewed by the ENGINEER.
- B. Legend plates shall be installed on the doors or covers of all enclosed electrical equipment.

2.7 MOUNTING HEIGHTS

- A. Devices shall be installed at heights as listed below unless otherwise shown on the Drawings or directed in the field. Dimensions given are from the finished floor to the centerline of the device unless otherwise noted:

Push button stations	4'-0"
Hand-off-auto selector switches	4'-0"
Receptacles	1'-6"
Lighting switches	4'-0"
Telephone outlets (for desk phones)	1 -6"
Telephone outlets (for wall phones)	4'-10"
Outdoor receptacles	30" above ground
Lighting panelboards	6'-6" to top of panel
Power panelboards, starters, disconnect switches, actuating handle	6'-6" to highest

2.8 ENCLOSURES

- A. Unless noted otherwise, enclosures shall be NEMA 12 for interior locations; NEMA 4 for outdoor locations and for units indicated weatherproof on the Plans; and explosion proof in Class I, Division I, Group D areas.

2.9 CUTTING AND PATCHING

- A. The CONTRACTOR shall be responsible for the proper location of all chases, recesses and openings required for the electrical work and shall advise other trades of the sizes and locations of those required for his work.
- B. The CONTRACTOR shall provide all sleeves, etc., required for the introduction and placement of his work and shall be responsible for their correct location.
- C. Cutting, coring, and patching required as a result of the omission or opening of sleeve shall be done by the CONTRACTOR at his own expense.
- D. All cutting, coring, and patching shall be done by workers skilled in that trade.

2.10 ACCESS DOORS

- A. The CONTRACTOR shall provide access doors for concealed pull boxes and other work items that require accessibility for operation and maintenance.

2.11 EQUIPMENT SUPPORTS, FOUNDATIONS AND STANDS

- A. The CONTRACTOR shall provide supports, foundations, stands, and platforms for electrical equipment when specified or required for proper installation.
- B. Supporting structures shall be designed and constructed of a strength to withstand stresses and to distribute the load over building areas.

2.12 EXCAVATION, TRENCHING AND BACKFILLING

- A. The CONTRACTOR shall perform all excavation and backfilling required for the complete installation of the electrical systems.
- B. Excavations and backfilling shall be made at such time as will permit the uninterrupted progress of the work.
- C. Trenches for conduit may be excavated manually or with mechanical trenching equipment. Where underground utilities are encountered, the trenching shall be done by hand. Trenches shall be opened the complete length and depth before conduit is placed so that if any obstructions are encountered proper provisions can be made to avoid them. The CONTRACTOR shall sheet and brace the trenches, where necessary, and shall furnish and keep in place such bridges and crossing as may be required.
- D. All conduits shall be securely fastened in place during construction and shall be plugged or capped to prevent entrance of grout, water or dirt. Any conduit having a defective joint shall not be installed.
- E. No conduit shall come into contact with tunnels, or gas, water or sewer pipes. The conduit where crossing gas, water or sewage pipes shall be separated therefrom by at least 6 inches of soil. Conduits laid parallel to tunnels or gas or water mains or sewers must be separated therefrom by at least 12 inches of soil.
- F. Where it is necessary to cut existing paving, the CONTRACTOR shall restore the paving to its original condition.

- G. Restore any disturbed grading or seeded areas to their original conditions.
- H. The appropriate sections of Division 2.00, Sitework, shall be referred to for additional requirements of the listed work.

2.13 ELECTRIC SERVICE

- A. The electric service from the power company shall be coordinated by the CONTRACTOR and all cost for obtaining the service shall be paid by the CONTRACTOR. The CONTRACTOR shall make connection to the power company equipment and conform to the power company requirements.

PART 3 – TESTS

3.1 GENERAL

- A. Following installation but not more than 120 hrs before energization, the CONTRACTOR shall test the electrical system and components in the manner described below. All test results shall be recorded in writing. If requested, the CONTRACTOR shall use test documents supplied by the ENGINEER to record data. A certified copy of all test results shall be submitted to the ENGINEER immediately after completion.
- B. All necessary test instruments and equipment shall be furnished by the CONTRACTOR.
- C. Tests shall be performed and the system reviewed by the ENGINEER for acceptability before any work is covered up or concealed. If such work is concealed, it shall be re-opened so that the test may be performed.
- D. The ENGINEER shall be given ample notification of tests to permit him or the OWNER to be present. If tests are conducted without notification, they shall be required to be redone.
- E. A representative of the CONTRACTOR shall accompany the ENGINEER during the final inspection and checking out of the electrical system.

3.2 TESTS REQUIRED

- A. All work shall be given a visual inspection for good workmanship and conformance with standard practice.
- B. The CONTRACTOR shall make any tests or adjustments required or recommended in the manufacturer's installation instructions.
- C. The direction of rotation of all generators shall be checked. The motor shall be mechanically uncoupled from the driven load where reverse rotation could damage equipment.
- D. All motor control circuits shall be checked for correct operation, as well as all control functions, all actuating mechanisms and sensors. All adjustable circuit breakers and overload protection devices for motor circuits shall be adjusted to allow the motors to start and run. Furnish and install the proper size heaters if required.
- E. After the ground system is completed, the CONTRACTOR shall test the resistance of the mat to earth. The test shall be conducted in the presence of the ENGINEER or OWNER. Testing shall be performed during normal dry weather conditions with at least five (5) consecutive non-rain days prior to the test. The resistance to ground shall not exceed 5 ohms. All ground

paths shall be tested for continuity and all connection points inspected. The ENGINEER shall be notified after installation of the grounding system but before backfilling in order to have an opportunity to inspect all connection points.

END OF SECTION

APPENDIX A

INSURANCE AND ENDORSEMENT TEMPLATE

CERTIFICATE OF LIABILITY INSURANCE

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement.

PRODUCER, CONTACT, INSURED, INSURER A-E, NAIC #

COVERAGES CERTIFICATE NUMBER: REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED.

Table with columns: INSR LTR, TYPE OF INSURANCE, ADDL SUBR INSR WVD, POLICY NUMBER, POLICY EFF (MM/DD/YYYY), POLICY EXP (MM/DD/YYYY), LIMITS. Rows include General Liability, Automobile Liability, Umbrella Liab, Workers Compensation, and Lease/Rented Eqpt.

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101. Additional Remarks Schedule, if more space is required) RE: Job Description: Water Treatment Plant, ITB#4, City of Ann Arbor is included as additional insured in accordance with the (See Attached Descriptions)

CERTIFICATE HOLDER: City of Ann Arbor Michigan, Attn: Water Treatment Plant, 301 East Huron St, Ann Arbor, MI 48104. CANCELLATION: SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE

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

Policy Number	Agency Number	Policy Effective Date
Policy Expiration Date	Date	Account Number
Named Insured	Agency	Issuing Company

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;">ADDITIONAL INSURED - OWNERS, LESSEES OR CONTRACTORS (FORM B)</p> <p>This endorsement modifies insurance provided under the following:</p> <p style="text-align: center;">COMMERCIAL GENERAL LIABILITY COVERAGE PART. SCHEDULE</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</p> <p>(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>CG 20 10 11 85</p>

- 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.

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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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AGENT COPY

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:

Effective Date:

Named Insured:

Form Number

Description

COMMON FORMS

IL 70 68 07 14

NOTICE OF CANCELLATION, NONRENEWAL OR MATERIAL CHANGE - THIRD PARTY

APPENDIX B

**FINAL INSPECTION REPORT -
BARTON HYDRO DAM - PHASE 1 Wet Inspection
(Dated: November 30, 2016)**



KISER HYDRO, LLC • HYDROELECTRIC SYSTEMS

1001 Stephenson Street • Norway, MI 49870 • (906) 563-5265 • Fax (906) 563-9344

FINAL INSPECTION REPORT

DATE: November 30, 2016

CUSTOMER

City of Ann Arbor
919 Sunset Road
Ann Arbor, MI 48103

PROJECT

Barton Hydro Dam – Phase I Wet Inspection

PO/KISER HYDRO JOB NUMBER

2017-00000336 / 16-51

STATUS (On Time/Delayed X Weeks, Work Underway/Work Stopped)

Work Completed – November 8, 2016

SUMMARY OF PROJECT

In preparation of a Ten Year Inspection & Overhaul of the Barton Dam Hydroelectric Plant, a top level, visual inspection was completed by Kiser Hydro field services in 2015. The visual inspection was completed on a dry unit and did not include any readings or visual inspections while the unit was running under loaded conditions. Kiser Hydro was contracted to perform a one-day wet inspection of the unit, where vibration and runout readings would be documented at various load conditions. This inspection is to be considered as a part of Phase I in completing the Ten Year Inspection & Overhaul of this unit.

FIELD SERVICES

A Kiser Hydro Field Technical Advisor and Project Manager completed a one-day wet inspection of the Barton Dam Hydroelectric Plant with the assistance of the plant operator. A vibration detector along with dial indicators were used to monitor vibration levels and runouts at critical points on the unit. Due to safety constraints with limited access during operation of the unit, not all areas were accessible for vibration and runout readings. Figure 1 below depicts the areas where readings were witnessed and recorded throughout this inspection.

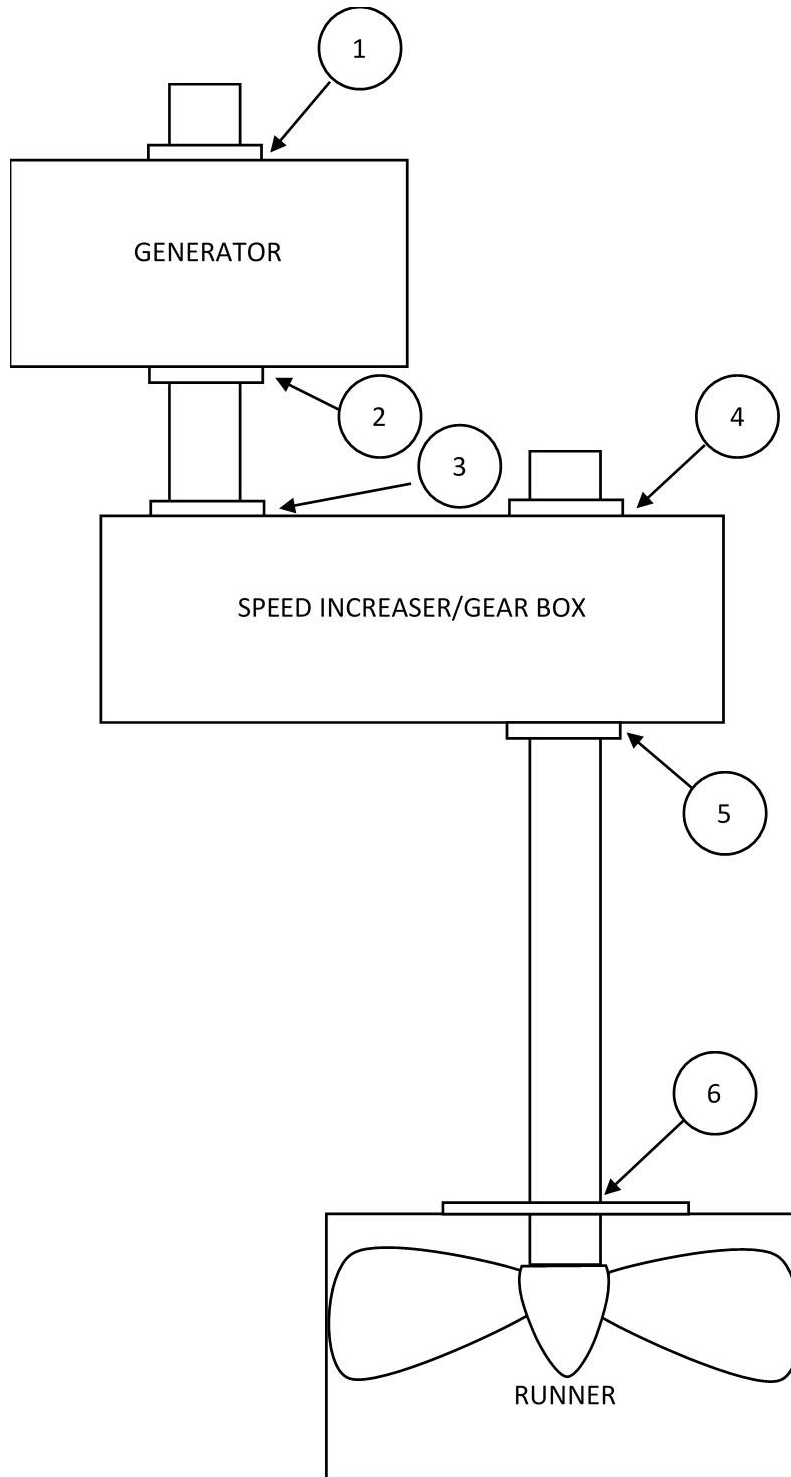


Figure 1: Inspection Identification Points

Vibration and runout readings were taken at various levels of gate opening ranging from 100 kW to Full Gate. The table below summarizes the readings taken during this inspection.

Table 1: Vibration & Runout Readings

READING LOCATION	OUTPUT	AVERAGE VIBRATION (in/s ²)	MAX RUN OUT (in)	AVERAGE AMBIENT TEMPERATURE (°F)
1	100 kW	0.03	NA	84
	300 kW	0.02	NA	85
	600 kW	0.04	NA	86
	Full Gate	0.04	NA	87
2	100 kW	0.02	NA	84
	300 kW	0.01	NA	82
	600 kW	0.02	NA	80
	Full Gate	0.02	NA	78
3	100 kW	0.02	.015 - .020	130
	300 kW	0.02		130
	600 kW	0.02		130
	Full Gate	0.04		130
4	100 kW	0.02	Rough Surface Unable to Get Readings	113
	300 kW	0.02		114
	600 kW	0.03		110
	Full Gate	0.03		106
5	100 kW	0.02	0.004	145
	300 kW	0.02	0.004	146
	600 kW	0.03	0.004	146
	Full Gate	0.04	0.004	147
6	100 kW	0.02	0.008	56
	300 kW	0.02	0.008	56
	600 kW	0.02	0.008	56
	Full Gate	0.02	0.008	56

The upper generator bearing, Location #1, indicates an increasing vibration with an increase in load, which indicates that the vibration is likely coming solely from the gearbox. The generator rotor should have a constant vibration level due to rotor imbalance at a constant speed.

Location #3, the high speed gearbox shaft, has excessive runout, measured from 0.015” to 0.020”, which is likely caused by a worn bearing(s). With new bearings, an acceptable runout would be less than 0.001”. Kiser Hydro recommends that this must be addressed and repaired prior to continued operation. Based on the readings taken, it is likely that the gear set also may

have some levels of wear due to the worn bearing/excessive runout. The temperatures recorded at this location are also a bit higher than expected. The increase in temperature is likely linked to the worn bearing and/or possible misalignment. Kiser Hydro recommends completing an alignment during the next outage where the gearbox and bearings are also replaced or repaired.

Location #5, the low speed gearbox shaft also has excessive runout 0.004", which is likely from a worn bearing(s). The vibration increased as the load increased, which may indicate that the gears, guide bearings, and/or thrust bearing are worn. The temperature at this location appeared to be a bit higher than at the upper bearing, Location #4. This variance in temperature is likely a result of a worn bearing and/or misalignment of the low speed shaft and turbine. Kiser Hydro recommends that all gear box bearings and gear sets be replaced to prevent further or future damage.

Location #6, the turbine bearing has a higher than recommended runout, 0.008". This runout could be due to excessive clearances due to bearing wear. Kiser Hydro does not know the age of the turbine bearing, but if the bearing is relatively new, then there may be excessive loads on the bearing. This should be investigated by the City of Ann Arbor prior to the ten-year inspection, so a more thorough recommendation of the inspection can be completed.

RECOMMENDATIONS

After completing the Phase I - Wet Inspection the main recommendations do not differ from the recommendations that were given in the Phase I – Dry Inspection from 2015. All recommendations listed below were previously listed along with budgetary figures for preparation of the ten-year overhaul.

- I. Recommendations As Found During Wet Inspection
 - a. Turbine Bearing
 - i. Remove, inspect and document clearances of the bearing
 - ii. City of Ann Arbor to confirm age of bearing
 - b. Gear Box
 - i. Kiser Hydro recommends having a detailed inspection and refurbishment performed by the Gear Box Manufacturer, Philadelphia Gear (or equivalent). This would include removal of the gear box for the work to be performed off site
 - ii. Based on the vibration readings of this inspection, it is likely that all bearings will need replacement. Due to the suspected wear, it may also be likely that the gear sets will need repair or replacement as well.
 - c. Unit Alignment
 - i. It is recommended that a full unit alignment be completed pending replacement and inspection of the generator, gear box and turbine bearings. This will ensure bearing life remains as designed and that excessive loading conditions are not being induced due to a mis-alignment.

Please let us know if there are any further questions regarding the wet inspection and the data collected. We appreciate this opportunity and look forward to continuing our relationship with the City of Ann Arbor on future projects.

Sincerely,

A handwritten signature in cursive script that reads "Amy Pitcher". The signature is written in black ink and is positioned above the typed name and contact information.

Amy Pitcher
General Manager of Field Services & Engineering
apitcher@kiserhydro.com
906-281-1623