CITY OF ANN ARBOR

INVITATION TO BID

GEDDES DAM – TAINTER GATE #4 REPLACEMENT

ITB #4356
Due Date: Tuesday, November 25, 2014 at 2:30 PM

Public Services Area
Administering Service Area/Unit

Issued By:

City of Ann Arbor
Procurement Unit
301 E. Huron Street
Ann Arbor, MI 48107

TABLE OF CONTENTS

Detailed Specifications

Division 1 – General Requirements

Section 01010	Summary of Work
Section 01140	Work Restrictions
Section 01210	Allowances
Section 01290	Payment Procedures
Section 01330	Submittal Procedures
Section 01370	Lead Based Paint Removal
Section 01420	References
Section 01500	Temporary Facilities and Controls
Section 01600	Product Requirements
Section 01740	Cleaning and Waste Management
Section 01770	Closeout Procedures
Section 01780	Closeout Submittals
Section 01810	Testing and Materials Inspection

Division 2 – Site Construction

Section 02220	Demolition

Division 3 – Concrete

Section 03300	Cast-In-Place Concrete

Division 5 – Steel

Section 05010	Metal Materials
Section 05050	Metal Fastening
Section 05120	Structural Steel
Section 05500	Metal Fabrications

Division 9 – Finishes

Section 09900	Painting

Division 15 – Mechanical

Section 015601	Tainter Gate Accessories

APPENDIX A	Paint Lead Test Results

Drawings

GENERAL

G-001 COVER SHEET

CIVIL

C-101 GENERAL SITE PLAN
C-301 NEW WORK PLAN

STRUCTURAL

S-000 NOTES
S-300 PLAN AND SECTIONS
S-301 SECTIONS AND DETAILS I
S-302 SECTIONS AND DETAILS II
S-303 SECTIONS AND DETAILS III

ADVERTISEMENT
FOR THE
GEDDES DAM – TAINTER GATE #4 REPLACEMENT
CITY OF ANN ARBOR

ITB NO. 4356

Sealed Bids will be received by the City of Ann Arbor Procurement Unit, 301 East Huron Street, c/o Customer Service Department, 1st Floor, Larcom City Hall, on or before Tuesday, November 25, 2014 at 2:30 PM (Local Time) for the construction of Geddes Dam – Tainter Gate #4 Replacement. Bids will be publically opened and read aloud at this time.

A pre-bid conference will be held Wednesday, November 12, 2014 at 9:00 AM at the City of Ann Arbor Water Treatment Plant located at 919 Sunset Road, Ann Arbor, MI 48103, followed by a site visit. Attendance is highly recommended.

Work to be done includes: demolition of an existing tainter gate, and fabrication and installation of a new tainter gate, replacement of gate sill, replacement of all gate chains at Geddes Dam, and all related work.

Bid documents, plans, specifications, and addenda shall be downloaded by Bidders at either of the following websites: Michigan Inter-governmental Trade Network (MITN) www.mitn.info or City of Ann Arbor Purchasing website: www.A2gov.org. It is the Bidder's responsibility to verify they have obtained all information before submitting a bid.

Each Bid shall be accompanied by a certified check, or Bid Bond by a recognized surety, in the amount of 5% of the total of the bid price. A Bid, once submitted, becomes the property of the City. In the sole discretion of the City, the City reserves the right to allow a bidder to reclaim submitted documents provided the documents are requested and retrieved no later than 48 hours prior to the scheduled bid opening.

The successful Bidder will be required to furnish satisfactory performance and labor and material bonds in the amount of 100% of the bid price and satisfactory insurance coverage.

Precondition for entering into a Contract with the City of Ann Arbor is compliance with Chapter 112 of Title IX of the Code of the City of Ann Arbor. The successful Bidder may also be required to comply with Chapter 23 of Title I of the Code of the City of Ann Arbor. Further information is outlined in the Contract Documents. All bidders are required to complete and submit the City of Ann Arbor Conflict of Interest Disclosure Form with the bid.

After the time of opening, no Bid may be withdrawn for a period of 90 days. The City reserves the right 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.

Technical questions regarding this project may be submitted in writing to the Consulting Engineer, Stantec Consulting, Attn: Paul Malocha, PE via email at paul.malocha@stantec.com. Questions by telephone call are prohibited. Technical questions directed to the Owner are prohibited. The deadline for questions shall be seven (7) calendar days before bids; questions are due on or before Tuesday, November 18, 2014 at 5:00 PM. Questions will not be received after this date.

Any further information on bid documents may be obtained from the Procurement Office, (734) 794-6500.

CITY OF ANN ARBOR PROCUREMENT UNIT

NOTICE OF PRE-BID CONFERENCE

A pre-bid conference for this project will be held on Wednesday, November 12, 2014 at 9:00 AM at the City of Ann Arbor Water Treatment Plant located at 919 Sunset Road, Ann Arbor, MI 48103. A site visit will follow the pre-bid conference to allow potential bidders the opportunity to view the project site. This will be the only opportunity for bidders to view the project site.

Attendance at this conference is highly recommended. Administrative and technical questions regarding this project will be answered at this 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.

The City shall make available to all prospective Bidders, prior to receipt of the Bids, access to the area in which the work is to be performed. Advance notice should be given to the Administering Service Area/Unit in cases where access to the site must be arranged by the City.

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 Page Numbers ITB 1-3 and on the "Bid Forms" provided with each blank properly filled in. If forms are not fully completed it may disqualify the bid.

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 submitted by Tuesday, November 18, 2014 at 5:00 PM and should be addressed as follows:

Specification/Scope of Work questions emailed to paul.malocha@stantec.com
Bid Process and HR Compliance questions emailed to mberryman@a2gov.org.

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, November 25, 2014 at 2:30 PM Local Time. Bids submitted late or via oral, telephonic, telegraphic, electronic mail or facsimile **will not** be considered or accepted.

Each Bidder must submit one (1) original Bid and two (2) additional Bid copies in a sealed envelope clearly marked: **ITB No. 4356 – Geddes Dam – Tainter Gate #4 Replacement.**

Bids must be addressed and delivered to:

City of Ann Arbor
Procurement Unit
c/o Customer Service Department, 1st Floor
301 East Huron Street
P.O. Box 8647
Ann Arbor, MI 48104

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

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.

Qualifications

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

As part of the proposal, Bidders shall provide documentation that the Bidder's company has at least 10 years of experience performing construction on similar projects, specifically, the fabrication and installation of tainter gates. Bidders shall also submit the attached form, "Section 5 – References," which identifies a minimum of three projects completed in the past five years on similar projects, including construction cost, contractor and subcontractor information, that demonstrate similar work experience and complexity to that included within these contract documents.

All key staff and subcontractors are subject to the approval by the City.

Official Documents

The City of Ann Arbor shall accept no alternates to the bid documents made by the Bidder unless those alternatives are set forth in the "Alternate" section of Bid form.

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.

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 90 days specified in the Advertisement.

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-1, Article III of the Contract. If these time requirements can not 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

Section 5, beginning at page GC-3, outlines the requirements for fair employment practices under City of Ann Arbor Contracts. To establish compliance with this Ordinance, the Bidder should complete and return with its bid completed copies of the Human Rights Division Contract Compliance Forms or an acceptable equivalent. In the event Human Rights forms are not submitted with bid, the Bidder will have 24 hours to provide once requested by the City.

Wage Requirements

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

Conflict of Interest Disclosure

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

Major Subcontractors

The Bidder shall identify 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.

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.

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 most recent OSHA recordable incident rate, DART rate, and lost workday rate.

5. If applicable, bidder shall provide the organization's excavation and trench safety program. Within this program, please identify the organization's Qualified Person for excavation and trench safety that will be on-site daily.

6. Bidder shall identify the project safety team, their qualifications, duties and city(s) of residence.

7. Bidder shall identify any major 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) (at any contractual level), that had any major injury or death on a project site? If so, describe how the organization has revised the program.

City of Ann Arbor Procurement Office
INSTRUCTIONS FOR CONTRACTORS

For Completing CONTRACT COMPLIANCE FORM

City Policy

The "non discrimination in contracts" provision of the City Code, (Chapter 112, Section 9:161) requires contractors/Bidders/grantees doing business with the City not to discriminate on the basis of actual or perceived race, color, religion, national origin, sex, age, condition of pregnancy, marital status, physical or mental limitations, source of income, family responsibilities, educational association, sexual orientation, gender identity or HIV status against any of their employees, any City employee working with them, or any applicant for employment. It also requires that the contractors/Bidders/grantees include a similar provision in all subcontracts that they execute for City work or programs.

This Ordinance further requires that each prospective contractor/Bidder submit employment data to the City showing current total employee breakdown by occupation, race and gender. This allows the Human Rights Office to determine whether or not the contractor/Bidder has a workforce that is reflective of the availability of women and under-represented minorities within the contractor's labor recruitment area (the area where they can reasonably be expected to recruit employees). ***This data is provided to the City on the Human Rights Contract Compliance Forms (attached).***

To complete the form:

1) **If a company has more than one location, then that company must complete 2 versions of the form.**

- **Form #1** should contain the employment data for the **entire corporation**.
- **Form #2** should contain the employment data for those employees:
  - who will be working on-site;
  - in the office responsible for completing the contract; or,
  - in the case of non-profit grantees, those employees working on the project funded by the City grant(s).

2) If the company has only one location, fill out Form #1 only.

3) Complete all data in the upper section of the form including the name of the person who completes the form and the name of the company/organization's president.

4) Complete the Employment Data in the remainder of the form. Please be sure to complete all columns including the Total Columns on the far right side of the form, and the Total row and Previous Year Total row at the bottom of the form.

5) Return the completed form(s) to *your contact* in the City Department for whom you will be conducting the work.

For assistance in completing the form, contact:
Procurement Office of the City of Ann Arbor
(734) 794-6500

If a contractor is determined to be out of compliance, the Procurement Office will work with them to assist them in coming into compliance.

CITY OF ANN ARBOR HUMAN RIGHTS OFFICE
CONTRACT COMPLIANCE FORM

Form #1

Entire Organization (Totals for All Locations where applicable)

Name of Company/Organization_____ Date Form Completed_____

Name and Title of Person Completing this Form_____ Name of President _____

Address_____ County_____ Phone #_____
(Street address) (City) (State) (Zip) (Area Code)

Fax#_____ Email Address_____
(Area Code)

EMPLOYMENT DATA

Job Categories	Number of Employees (Report employees in only one category)												
	Male						Female						
	White	Black or African American	Asian	Hispanic or Latino	Native Hawaiian or Other Pacific Islander	American Indian or Alaska Native	White	Black or African American	Asian	Hispanic or Latino	Native Hawaiian or Other Pacific Islander	American Indian or Alaskan Native	TOTAL COLUMNS A-L
	A	B	C	D	E	F	G	H	I	J	K	L	
Exec/Sr. Level Officials													
Supervisors													
Professionals													
Technicians													
Sales													
Admin. Support													
Craftspeople													
Operatives													
Service Workers													
Laborers/Helper													
Apprentices													
Other													
TOTAL													
PREVIOUS YEAR TOTAL													

CITY OF ANN ARBOR HUMAN RIGHTS OFFICE

Form #2

CONTRACT COMPLIANCE FORM

Local Office (Only those employees that will do local or on-site work, if applicable)

Name of Company/Organization_____ Date Form Completed_____

Name and Title of Person Completing this Form_____ Name of President _____

Address_____ County_____ Phone #_____
(Street address) (City) (State) (Zip) (Area Code)

Fax#_____ Email Address_____
(Area Code)

EMPLOYMENT DATA

Job Categories	Number of Employees (Report employees in only one category)												
	Male						Female						
	White	Black or African American	Asian	Hispanic or Latino	Native Hawaiian or Other Pacific Islander	American Indian or Alaska Native	White	Black or African American	Asian	Hispanic or LatinO	Native Hawaiian or Other Pacific Islander	American Indian or Alaskan Native	TOTAL COLUMNS A-L
	A	B	C	D	E	F	G	H	I	J	K	L	
Exec/Sr. Level Officials													
Supervisors													
Professionals													
Technicians													
Sales													
Admin. Support													
Craftspeople													
Operatives													
Service Workers													
Laborers/Helper													
Apprentices													
Other													
TOTAL													
PREVIOUS YEAR TOTAL													

2/12

Questions about this form? Call 734-794-6500

ATTACHMENT C
CITY OF ANN ARBOR
LIVING WAGE ORDINANCE
DECLARATION OF COMPLIANCE

The Ann Arbor Living Wage Ordinance (Section 1:811-1:821 of Chapter 23 of Title I of the Code) requires that employers providing services to the City or recipients of grants for financial assistance (in amounts greater than $10,000 in a twelve-month period of time) pay their employees who are working on the City project or grant, a minimum level of compensation known as the **Living Wage**. This wage must be paid to the employees for the length of the contract/project.

Companies employing fewer than 5 persons and non-profits employing fewer than 10 persons are exempt from the Ordinance. If this exemption applies to your firm, please check below:

_____ This **company** is exempt due to the fact that we employ or contract with fewer than 5 individuals.

_____ This **non-profit agency** is exempt due to the fact that we employ or contract with fewer than 10 employees.

The Ordinance requires that all contractors/vendors and/or grantees agree to the following terms:

a) To pay each of its employees performing work on any covered contract or grant with the City, no less than the living wage, which is defined as $12.70/hour when health care is provided, or no less than $14.18/hour for those employers that do *not* provide health care. It is understood that the Living Wage will be adjusted each year on April 30, and covered employers will be required to pay the adjusted amount thereafter. The rates stated above include any adjustment for 2014.

b) Please check the boxes below which apply to your workforce:

Employees who are assigned to *any covered* City project or grant will be paid at or above the applicable living wage without health benefits Yes_____ No_____

OR

Employees who are assigned to *any covered* City project or grant will be paid at or above the applicable living wage with health benefits Yes_____ No_____

c) To post a notice approved by the City regarding the Living Wage Ordinance in every work place or other location in which employees or other persons contracting for employment are working.

d) To provide the City payroll records or other documentation as requested; and,

e) To permit access to work sites to City representatives for the purposes of monitoring compliance, investigating complaints or non-compliance.

The undersigned authorized representative hereby obligates the contractor/vendor or grantee to the above stated conditions under penalty of perjury and violation of the Ordinance.

Company Name	Address, City, State, Zip
Signature of Authorized Representative	Phone (area code)
Type or Print Name and Title	Email address
Date signed	

Questions about this form? Please contact:
Procurement Office City of Ann Arbor
Phone: 734/794-6500

Revised 3/2014 rev.0 LW-2

CITY OF ANN ARBOR
LIVING WAGE ORDINANCE

RATE EFFECTIVE APRIL 30, 2014 - ENDING APRIL 29, 2015

$12.70 per hour
If the employer provides health care benefits*

$14.18 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
Mark Berryman at 734/794-6500 or mberryman@a2gov.org

Revised 3/2014 Rev.0 LW-1

Vendor Conflict of Interest Disclosure Form

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

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

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

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

Vendor Name	**Vendor Phone Number**
Conflict of Interest Disclosure *	
Name of City of Ann Arbor employees, elected officials, or immediate family members with whom there may be a potential conflict of interest.	( ) Relationship to Employee_____ ( ) Interest in vendor's company_____ ( ) Other_____

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

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

Signature of Vendor Authorized Representative | Date | Printed Name of Vendor Authorized Representative

PROCUREMENT USE ONLY

☐ Yes, named employee was involved in Bid / Proposal process.

☐ No, named employee was not involved in procurement process or decision.

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 Advertisement, Human Rights Division Contract Compliance Forms, Conflict of Interest Disclosure 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 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 1:319 (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 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 _____, 20__.

_____	_____
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 two.)

By signing below the authorized representative of the Bidder hereby certifies that:

The Bidder 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 proposal, is authorized to execute contracts on behalf of respondent.*

  *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 with the county of _____ , whose members are (attach list including street and mailing address for each.)

- An individual, whose signature with address, is affixed to this Bid.

_____Date: _____,
Signature

(Print) Name _____ Title _____

Firm: _____

Address: _____

Contact Phone _____ Fax _____

Email _____

BID FORM

Section 1 – Schedule of Prices

Project: Geddes Dam – Tainter Gate #4 Replacement
ITB No.: 4356

Bidder's Name: _____

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

Bid Items

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

GEDDES DAM TAINTER GATE #4 REPLACEMENT – BASE BID					
Item No.	**Item Description**	**Qty**	**Unit**	**Unit Price**	**Total Price**
1.	General Conditions, Insurance, Bonds, Mobilization (max. 5% of bid).	1	LS	$	$
2.	Demolish Existing Gate.	1	LS	$	$
3.	Construct and Install New Tainter Gate.	1	LS	$	$
4.	Repair Existing Chain Guard and Paint Hoist Spooler Shaft.	1	EA	$	$
5.	Reconstruct Gate Sill.	1	LS	$	$
6.	Replace Chains on Gates #1, #2 and #3.	6	EA	$	$
7.	Miscellaneous Repairs Allowance.	1	LS	$ 20,000.00	$ 20,000.00
8.	Project Close Out.	1	LS	$	$
				TOTAL BASE BID (ITEMS 1 THROUGH 8)	**$**

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

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

A. GENERAL

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

Quantities of work completed under the Contract will be measured by the ENGINEER according to the United States standard measures. When tons are specified, the unit shall be the ton of 2000 pounds. When measurements are stated in miles, stations, acres, they will be horizontal measurements unless specified otherwise. 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

In each and every instance in the schedule attached, 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.

MEASUREMENT AND PAYMENT SCHEDULE

BASE BID ITEMS

ITEM IN PROPOSAL	METHOD OF MEASUREMENT	BASIS OF PAYMENT
General Conditions, Insurance, Bonds, Mobilization.	By the unit lump sum (LS).	The cost of mobilization at the beginning of the construction period at the job site including offices, stores, conveniences, and other temporary facilities. Includes whatever means the CONTRACTOR deems necessary for accessing the work, organizing the project, coordination with OWNER, ENGINEER, third parties and sub-contractors, obtaining all permits, permit inspection fees, permit bond fees, permit requirements, Shop Drawings, paperwork, insurance and bonds, bringing equipment to the site as required, management of job, and meeting all requirements of the general conditions. Any costs assumed to be above and beyond the value of this pay item shall be incidental to other pay items in the Contract. Maximum 5% of total Contract amount.
Demolish Existing Tainter Gate.	By the unit lump sum (LS).	Complete demolition of tainter gate and related structures as indicated on the Drawings. Includes loading transport and installation of existing stoplogs, sawcutting and demolition of existing trunnion pins, demolition of steel inserts not called out elsewhere, removal, transportation and disposition of materials off site.
Construct and Install New Tainter Gate.	By the unit lump sum (LS).	Field measurement, verification of all dimensions, fabricate new tainter gate, paint, and install. Includes trunnion pins and wall inserts, new concrete at pins, new chains, and all related work. Startup and testing. Calibrate existing instrumentation for new gate.
Repair Existing Chain Guard and Paint Hoist Spooler Shaft.	By the unit each (EA).	Remove, repair, full blast, paint and reinstall chain guard. Scaffolding, containment, blast and paint shaft.
Reconstruct Gate Sill.	By the unit lump sum (LS).	Demolish existing sill, furnish and install new sill. Includes all concrete work.
Replace Chains on Gates #1, #2 and #3.	By the unit each (EA).	Remove existing chains and install new chains at each location. Includes diving services, connections, alignment and all related work.
Miscellaneous Repairs Allowance.	By the unit lump sum (LS).	Repairs not called out elsewhere which are determined to be necessary during construction. Pays only for pre-approved items and only to amount indicated.

ITEM IN PROPOSAL	METHOD OF MEASUREMENT	BASIS OF PAYMENT
Project Closeout.	By the unit lump sum (LS).	Removal of all equipment from and complete restoration of all areas. Remove, transport and unload stoplogs on OWNER's property. Closeout paper work including reports, record drawings, waivers of lien, warranty, etc.

END OF SECTION

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.

Item Number	Description	Add/Deduct Amount

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 _____

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-1, 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 _____

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.

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

Subcontractor (Name and Address)	Work	Amount
	Demolition	
	Gate Fabrication	
	Painting	
	Weld Inspection	
	Paint Inspection	
	Other	

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 _____

BID FORM

Section 5 – References

GENERAL CONTRACTOR (Name: _____)

Include a minimum of three references from similar projects completed within the past ten (10) years involving tainter gate fabrication and installation.

Refer also to Instructions to Bidders for additional requirements.

1) _____ _____ _____
Project Name Cost Date Constructed

_____ _____
Contact Name Phone Number

2) _____ _____ _____
Project Name Cost Date Constructed

_____ _____
Contact Name Phone Number

3) _____ _____ _____
Project Name Cost Date Constructed

_____ _____
Contact Name Phone Number

BID FORM

Section 6 – References

SUBCONTRACTOR (Name: _____)

Include a minimum of three references from similar projects completed within the past five (5) years.

Refer also to Instructions to Bidders for additional requirements.

1) _____ _____ _____
Project Name Cost Date Constructed

_____ _____
Contact Name Phone Number

_____
Description

2) _____ _____ _____
Project Name Cost Date Constructed

_____ _____
Contact Name Phone Number

_____
Description

3) _____ _____ _____
Project Name Cost Date Constructed

_____ _____
Contact Name Phone Number

_____
Description

CONTRACT

THIS AGREEMENT is made on the _____ day of _____, 20__, 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 "Geddes Dam – Tainter Gate #4 Replacement" 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:

Human Rights Division Contract
Living Wage Declaration of Compliance Forms (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.

Supervising Professional or Owner means Senior Utilities Engineer or other persons acting under the authorization of the Administrator/Manager of the Administering Service Area/Unit.

Engineer or Owner's Representative means Consulting Professional acting under the authorization of the Supervising Professional/Owner.

Project means, Geddes Dam – Tainter Gate #4 Replacement, Bid No. ITB-4356

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 eighteen (18) consecutive weeks. Shorter completion times for certain portions of the work may be specified in the Detailed Specifications. Liquidated damages shall also apply to these intermediate milestones based on the amounts listed in the Detailed Specifications.

(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 $500.00 for each calendar day of delay in the completion of all the work. If any liquidated damages are unpaid by the Contractor, the City shall be entitled to deduct these unpaid liquidated damages from the monies due the Contractor.

As an independent requirement, where the Detailed Specifications or Plans identify certain portions of the work to be completed within a shorter period of time and the Contractor fails to complete each portion within the shorter period specified for each portion, including any extension granted in writing by the Project Supervisor, the City is entitled to deduct from the monies due the Contractor, as liquidated damages and not as a penalty, the amount equal to that identified in Specifications or Plans for each portion or Phase of the work not timely completed for each calendar day of delay in completion of each portion of the work.

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

Liquidated damages under this section are in addition to any liquidated damages due under Section 5 of the General Conditions.

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 Forms 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 without the written consent of 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.

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.

ARTICLE X - Entire Agreement

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

By_____
Jacqueline Beaudry, City Clerk

Approved as to substance

By_____
Steven D. Powers, City Administrator

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 _____, 20__, 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 _____, 20__.

_____
(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:

_____

_____

_____

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 _____, 20__, 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 _____, 20__.

_____
(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.

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.

Further, to the extent that any employees of the Contractor providing services under this contract are not part of the class of craftsmen, mechanics and laborers who receive a prevailing wage in conformance with Section 1:319 of Chapter 14 of Title I of the Code of the City of Ann Arbor, the Contractor agrees to conform to Chapter 23 of Title I of the Code of the City of Ann Arbor, as amended, which in part states:

1:814. Applicability.

(1) This Chapter shall apply to any person that is a contractor/Bidder or grantee as defined in Section 1:813 that employs or contracts with five (5) or more individuals; provided, however, that this Chapter shall not apply to a non-profit contractor/Bidder or non-profit grantee unless it employs or contracts with ten (10) or more individuals.

(2) This Chapter shall apply to any grant, contract, or subcontract or other form of financial assistance awarded to or entered into with a contractor/Bidder or grantee after the effective date of this Chapter and to the extension or renewal after the effective date of this Chapter of any grant, contract, or subcontract or other form of financial assistance with a contractor/Bidder or grantee.

1:815. Living Wages Required.

(1) Every contractor/Bidder or grantee, as defined in Section 1:813, shall pay its covered employees a living wage as established in this Section.

(a) For a covered employer that provides employee health care to its employees, the living wage shall be $12.52 an hour, or the adjusted amount hereafter established under Section 1:815(3).

(b) For a covered employer that does not provide health care to its employees, the living wage shall be $13.96 a hour, or the adjusted amount hereafter established under Section 1:815(3).

(2) In order to qualify to pay the living wage rate for covered employers providing employee health care under subsection 1:815(1)(a), a covered employer shall furnish proof of said health care coverage and payment therefor to the City Administrator or his/her designee.

(3) The amount of the living wage established in this Section shall be adjusted upward no later than April 30, 2002, and every year thereafter by a percentage equal to the percentage increase, if any, in the federal poverty guidelines as published by the United States Department of Health and Human Services for the years 2001 and 2002. Subsequent annual adjustments shall be based upon the percentage increase, if any, in the United States Department of Health and Human Services poverty guidelines when comparing the prior calendar year's poverty guidelines to the present calendar year's guidelines. The applicable percentage amount will be converted to an amount in cents by multiplying the existing wage under Section 1.815(1)(b) by said percentage, rounding upward to the next cent, and adding this amount of cents to the existing living wage levels established under Sections 1:815(1)(a) and 1:815(1)(b). Prior to April 1 of each calendar year, the City will notify any covered employer of this adjustment by posting a written notice in a prominent place in City Hall, and, in the case of a covered employer that has provided an address of record to the City, by a written letter to each such covered employer.

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 Section 209 of the Elliot-Larsen Civil Rights Act (MCL 37.2209). The Contractor further agrees to comply with the nondiscrimination provisions of Chapter 112 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. The Contractor further agrees to comply with the provisions of Section 9:161 of Chapter 112 of the Ann Arbor City Code and in particular the following excerpts:

9:161 NONDISCRIMINATION BY CITY CONTRACTORS

(1) All Contractors proposing to do business with the City of Ann Arbor shall satisfy the nondiscrimination administrative policy adopted by the City Administrator in accordance with the guidelines of this section. All Contractors shall receive approval from the Director prior to entering into a contract with the City, unless specifically exempted by administrative policy. All City Contractors shall take affirmative action to insure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity and tends to eliminate inequality based upon race, national origin or sex.

(2) Each prospective contractor shall submit to the City data showing current total employment by occupational category, sex and minority group. If, after verifying this data, the Director concludes that it indicates total minority and female employment commensurate with their availability within the contractor's labor recruitment area, i.e., the area from which the contractor can reasonably be expected to recruit, said contractor shall be accepted by the Director as having fulfilled affirmative action requirements for a period of one year at which

time the Director shall conduct another review. Other Contractors shall develop an affirmative action program in conjunction with the Director. Said program shall include specific goals and timetables for the hiring and promotion of minorities and females. Said goals shall reflect the availability of minorities and females within the Contractor's labor recruitment area. In the case of construction Contractors, the Director shall use for employment verification the labor recruitment area of the Ann Arbor-Ypsilanti standard metropolitan statistical area. Construction Contractors determined to be in compliance shall be accepted by the Director as having fulfilled affirmative action requirements for a period of six (6) months at which time the Director shall conduct another review.

(3) In hiring for construction projects, contractors shall make good faith efforts to employ local persons, so as to enhance the local economy.

(4) All Contracts shall include provisions through which the Contractor agrees, in addition to any other applicable Federal or State labor laws:

(a) To set goals, in conference with the Human Resources Director, for each job category or division of the work force used in the completion of the City work;

(b) To provide periodic reports concerning the progress the Contractor has made in meeting the affirmative action goals it has agreed to;

(c) To permit the Director access to all books, records and accounts pertaining to its employment practices for the purpose of determining compliance with the affirmative action requirements.

(5) The Director shall monitor the compliance of each contractor with the nondiscrimination provisions of each contract. The Director shall develop procedures and regulations consistent with the administrative policy adopted by the City Administrator for notice and enforcement of non-compliance. Such procedures and regulations shall include a provision for the posting of Contractors not in compliance.

(6) All City Contracts shall provide further that breach of the obligation not to discriminate shall be a material breach of the Contract for which the City shall be entitled, at its option, to do any or all of the following:

(a) To cancel, terminate, or suspend the Contract in whole or part and/or refuse to make any required periodic payments under the Contract;

(b) Declare the Contractor ineligible for the award of any future contracts with the City for a specified length of time;

(c) To recover liquidated damages of a specified sum, said sum to be that percentage of the labor expenditure for the time period involved which would have accrued to minority group members had the affirmative action not been breached;

(d)Impose for each day of non-compliance, liquidated damages of a specified sum, based upon the following schedule:

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

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

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 l3. 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 l80 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 l0 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

A. The Contractor shall procure and maintain during the life of this Contract, including the guarantee period and during any warranty work, such insurance policies, including those set forth below, as will protect itself and the City from all claims for bodily injuries, death or property damage which may arise under this Contract; whether the acts were made by the Contractor or by any subcontractor or anyone employed by them directly or indirectly. The following insurance policies are required:

1. Worker's Compensation Insurance in accordance with all applicable state and federal statutes. Further, Employers Liability Coverage shall be obtained in the following minimum amounts:

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

2. Commercial General Liability Insurance equivalent to, as a minimum, Insurance Services Office form CG 00 01 07 98. The City of Ann Arbor shall be named as an additional

insured. There shall be no added exclusions or limiting endorsements including, but not limited to: Products and Completed Operations, Explosion, Collapse and Underground coverage or Pollution. Further, the following minimum limits of liability are required:

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

$2,000,000 Per Job General Aggregate

$1,000,000 Personal and Advertising Injury

$2,000,000 Products and Completed Operations Aggregate

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

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

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

C. In the case of all Contracts involving on-site work, the Contractor shall provide to the City before the commencement of any work under this Contract documentation demonstrating it has obtained the above mentioned policies. Documentation must provide and demonstrate an unconditional 30 day written notice of cancellation in favor of the City of Ann Arbor. Further, the documentation must explicitly state the following: (a) the policy number; name of insurance company; name and address of the agent or authorized representative; name and address of insured; project name; policy expiration date; and specific coverage amounts; (b) any deductibles or self-insured retentions which shall be approved by the City, in its sole discretion; (c) that the policy conforms to the requirements specified. An original certificate of insurance may be provided as an initial indication of the required insurance, provided that no later than 21 calendar days after commencement of any work the Contractor supplies a copy of the endorsements required on the policies. Upon request, the Contractor shall provide within 30 days a copy of the policy(ies) to the City. If any of the above coverages expire by their terms during the term of this Contract, the Contractor shall deliver proof of renewal and/or new policies to the Administering Service Area/Unit at least ten days prior to the expiration date.

D. Any Insurance provider of Contractor shall be admitted and authorized to do business in the State of Michigan and shall carry and maintain a minimum rating assigned by A.M. Best & Company's Key Rating Guide of "A-" Overall and a minimum Financial Size Category of "V". Insurance policies and certificates issued by non-admitted insurance companies are not acceptable unless approved in writing by the City.

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 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.

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 Geddes Dam – Tainter Gate #4 Replacement, 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.

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 Geddes Dam – Tainter Gate #4 Replacement. 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:

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 Advertisement. 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.

A copy of the Public Services Department Standard Specifications may be purchased from the Engineering Division, (Fourth Floor, City Hall, Ann Arbor, Michigan), for $35.00 per copy. In addition, a copy of these Standard Specifications is available for public viewing at the Engineering Division office, for review Monday through Friday between the hours of 8:30 a.m. and 4:00 p.m. Copies of the Standard Specifications can also be downloaded from the web link:

http://www.a2gov.org/government/publicservices/project_management/privatedev/pages/standardspecificationsbook.aspx.

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 subcontractor 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.

DETAILED SPECIFICATIONS

SECTION 01010

SUMMARY OF WORK

PART 1 – GENERAL

1.1 SUMMARY OF WORK

A. Work under this Contract consists of demolition of an existing tainter gate; and fabrication, painting and installation of a new tainter gate at Geddes Dam, and all related work.

B. The foregoing descriptions shall not be construed as a complete description of all work required.

1.2 CONTRACT DOCUMENTS

A. The Work to be done is shown on the set of Drawings entitled Geddes Dam – Tainter Gate #4 Replacement. The numbers and titles of all Drawings appear on the cover sheet of the Drawings. 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. Where references in the Contract Documents are made to CONTRACTORs for specific disciplines of work (e.g., Electrical CONTRACTOR, etc.), these references shall be interpreted to be the single prime CONTRACTOR when the project is bid or awarded as a single prime contract.

D. The prime CONTRACTOR shall be responsible for all work in the Contract Documents regardless of the division of disciplines.

E. ENGINEER shall provide the CONTRACTOR an electronic copy on CD of the Specifications and Contract Drawings. The CONTRACTOR shall be responsible for the production of his construction sets.

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 that the 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 CONSTRUCTION PERMITS, EASEMENTS AND ENCROACHMENTS

A. The OWNER shall obtain or cause to be obtained all permanent and temporary construction easements required. No easements are anticipated for this project.

B. The CONTRACTOR shall obtain, keep current and pay all fees for any other necessary construction permits from those authorities, agencies, or municipalities having jurisdiction over land areas, utilities, or structures which are located within the Contract limits and which will be occupied, encountered, used, or temporarily interrupted by the CONTRACTOR's operations unless otherwise stated. CONTRACTOR shall pay plan review fees and any other fees for required permits. Record copies of all permits shall be furnished to the ENGINEER and OWNER.

C. When construction permits are accompanied by regulations or requirements issued by a particular authority, agency or municipality, it shall be the CONTRACTOR's responsibility to become familiar with and comply with such regulations or requirements as they apply to CONTRACTOR’s operations on this Project.

D. The CONTRACTOR will be required to follow the requirements established by all permits necessary for the construction of this project. The following is a list of all permits that must be obtained prior to the beginning of construction.

1. MDEQ Joint Permit (Part 315 and other sections as required)

2. Applicable City Building Permits (all trades).

E. The MDEQ joint permit will be applied for and obtained by the OWNER through the Michigan Department of Environmental Quality. The CONTRACTOR shall obtain a copy of this permit from the ENGINEER prior to construction.

F. The permits for the various trades shall be applied for and paid for by the CONTRACTOR.

1.5 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. Structural design shown on the Contract Drawings is based upon typical weights for major items of equipment as indicated on the Contract Drawings and specified. If the equipment furnished exceeds the weights of said equipment, the CONTRACTOR shall assume the responsibility for all costs of redesign and for any construction changes required to accommodate the equipment furnished, including the ENGINEER's expenses in connection therewith.

C. 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.

1.6 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 assessed to the CONTRACTOR for additional engineering and inspection costs will be determined based on actual hours charged to the job by the ENGINEER. Daily rates will depend on the number and classifications of employees involved, but in no case shall such charges exceed $900 per day for field personnel and $1,100 per day for engineering personnel, based on an eight hour workday.

C. Charges for additional OWNER's expenses shall be in addition to any liquidated damages assessed in accordance with the Contract.

1.7 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.

1.8 SURVEYS AND LAYOUT

A. All work under this Contract shall be constructed in accordance with the lines and grades shown on the Drawings or as directed by the ENGINEER or OWNER. Elevation of existing ground and appurtenances are believed to be reasonably correct but are not guaranteed to be absolute and therefore are presented only as an approximation. Any error or apparent discrepancy in the data shown or omissions of data required for accurately accomplishing the stake out survey shall be referred immediately to the ENGINEER for interpretation or correction.

B. All survey work for construction control purposes, staking, and all related work shall be performed by the CONTRACTOR.

C. CONTRACTOR shall have the responsibility to carefully preserve the bench marks, reference points and stakes, and in the case of destruction thereof by the CONTRACTOR or resulting from CONTRACTOR's negligence, the CONTRACTOR shall be charged with the expense and damage resulting therefrom and shall be responsible for any mistakes that may be caused by the unnecessary loss or disturbance of such bench marks, reference points and stakes.

D. Existing or new control points, property markers and monuments that will be or are destroyed during the normal causes of construction shall be reestablished by the CONTRACTOR and all reference ties recorded therefore shall be furnished to the OWNER and ENGINEER. All computations necessary to establish the exact position of the work shall be made and preserved by the CONTRACTOR.

E. The OWNER or ENGINEER may check all or any portion of the work and the CONTRACTOR shall afford all necessary assistance to the OWNER and ENGINEER in carrying out such checks. Any necessary corrections to the work shall be immediately made by the CONTRACTOR. Such checking by the OWNER or ENGINEER shall not relieve the CONTRACTOR of any responsibilities for the accuracy or completeness of CONTRACTOR's work.

1.9 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.

1.10 FIRE PROTECTION

A. CONTRACTOR shall take all necessary precautions to prevent fires at or adjacent to the work 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.

F. All material demolished from site should not be stored on location.

1.12 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 MSDS sheets for all chemicals to OWNER.

1.13 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.

3. 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.

1.14 ULTIMATE DISPOSITION OF CLAIMS BY ONE CONTRACTOR ARISING FROM ALLEGED DAMAGE BY ANOTHER CONTRACTOR

A. During the progress of the work, other CONTRACTORS may be engaged in performing other work or may be awarded other Contracts for additional work on this project and/or on this site. In that event, the CONTRACTOR shall coordinate the work to be done hereunder with the work of such other CONTRACTORS and the CONTRACTOR shall fully cooperate with such other CONTRACTORs and carefully fit its own work to that provided under other Contracts as may be directed by the OWNER. The CONTRACTOR shall not commit or permit any act which will interfere with the performance of work by any other CONTRACTOR.

B. If the OWNER shall determine that the CONTRACTOR is failing to coordinate this work with the work of the other CONTRACTORS as the OWNER directed, then the OWNER shall have the right to withhold any payments otherwise due hereunder until the CONTRACTOR completely complies with the OWNER's directions.

C. If the CONTRACTOR notifies the OWNER in writing that another CONTRACTOR is failing to coordinate his work with the work of this Contract as directed, the OWNER will promptly investigate the charge. If the OWNER finds it to be true, he will promptly issue such directions to the other CONTRACTOR with respect thereto as the situation may require. The OWNER, the ENGINEER, nor any of their agents shall not, however, be liable for any damages suffered by the CONTRACTOR by reason of the other CONTRACTOR's failure to promptly comply with the directions so issued by the OWNER, or by reason of another CONTRACTOR's default in performance, it being understood that the OWNER does not guarantee the responsibility or continued efficiency of any CONTRACTOR.

D. The CONTRACTOR shall indemnify and hold the OWNER and the ENGINEER harmless from any and all claims of judgments for damages and from costs and expenses to which the OWNER may be subjected or which it may suffer or incur by reason of the CONTRACTOR's failure to comply with the OWNER's directions promptly.

E. Should the CONTRACTOR sustain any damage through any act or omission of any other CONTRACTOR having a Contract with the OWNER for the performance of work upon the site or of work which may be necessary to be performed for the proper execution of the work to be performed hereunder, or through any act or omission of a Subcontractor of such Contract, the CONTRACTOR shall have no claim against the OWNER or the ENGINEER for such damage, but shall have a right to recover such damage from the other CONTRACTOR.

F. Should any other CONTRACTOR having or who shall hereafter have a Contract with the OWNER for the performance of work upon the site sustain any damage through any act or omission of the CONTRACTOR hereunder or through any act or omission of any Subcontractor of the CONTRACTOR, the CONTRACTOR agrees to reimburse such other CONTRACTOR for all such damages and to defend at his own expense any suit based upon such claim and if any judgment or claims against the OWNER shall be allowed, the CONTRACTOR shall pay or satisfy such judgment or claim and pay all costs and expenses in connection therewith and shall indemnify and hold the OWNER harmless from all such claims.

G. The OWNER's right to indemnification hereunder shall in no way be diminished, waived or discharged, by its recourse to assessment of liquidated damages as provided in the Contract, or by the exercise of any other remedy provided for by Contract Documents or by law.

1.15 BLASTING AND EXPLOSIVES

A. The use of blasting or explosives shall not be allowed under this project.

1.16 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.

1.17 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 mixing and placing of concrete or pavement courses, the laying of masonry, and installation of sewers and water mains shall be stopped during rainstorms and when ordered by the OWNER; and all freshly placed work shall be protected by canvas or other suitable covering in such manner as to prevent running water from coming in contact with it. Sufficient coverings shall be provided and kept ready at hand for this purpose. The limitations and requirements for mixing and placing concrete, or laying of masonry, 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, ground thawing equipment 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.).

1.18 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.

1.19 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.

1.20 PROTECTION OF TREES

A. All trees which are to be preserved and which, in the opinion of the ENGINEER, might be subject to damage by the CONTRACTOR's operations, shall be adequately protected against damage to the bark by 2-inch thick vertical planking securely wired or tied completely around the tree trunk. Such protection shall not be removed until authorized by the ENGINEER.

B. Machine excavation shall not be made within a circular area of any tree, the diameter of the area in feet being equal to the radius of the tree in inches. Snow fencing shall be placed around this area for any tree in or facing the work area. If hand excavation within this area cuts across a large root of a tree, the butting of which, in the opinion of the ENGINEER, would be injurious to the tree, the CONTRACTOR shall tunnel under such root and protect it from injury throughout the work.

C. Trees which interfere with the work, and the removal of which is permitted, shall be removed by the CONTRACTOR at his expense and in a safe manner. Such tree removal shall be considered incidental to the work. No trees are to be removed without the expressed approval of the governmental body having jurisdiction thereof, and of the ENGINEER.

PART 2 – PRODUCTS

(NOT USED)

PART 3 – EXECUTION

(NOT USED)

END OF SECTION

SECTION 01140

WORK RESTRICTIONS

PART 1 - GENERAL

1.1 SUMMARY

A. The proposed tainter gate shall be fabricated, installed, tested and put into operation while the existing dam and other gates remain in service.

1.2 GENERAL REQUIREMENTS

A. The work area is encompassed by a public park. The CONTRACTOR's activities shall not interfere with continued public access to park areas, except the staging area as designated on the Drawings.

B. Except for closure of Bay #4 for construction, river flow shall not be impeded by the CONTRACTOR's activities. If Gate #3 needs to be temporarily closed and locked out, the CONTRACTOR shall give the OWNER a minimum of 14 days notice to coordinate closure of gate.

C. The CONTRACTOR shall prevent paint, metal shavings, oil products, or any construction debris from entering the Huron River. The CONTRACTOR's personnel shall not deposit cigarette butts or other garbage into the river. The CONTRACTOR shall be responsible to immediately remove and mitigate any materials entering the river as a consequence of his activities or those of his personnel.

D. The OWNER shall have the authority to order work stopped or prohibited that would, in his opinion, result in harm to the river, park areas or public.

E. After any damage to the existing facilities by the CONTRACTOR's Work that, in the opinion of the OWNER, constitutes an emergency, the CONTRACTOR shall be immediately available to provide services for the repair of damage and mitigation of the emergency.

F. Access to Pathways, Roadways, and Parking Areas

1. An unobstructed vehicular traffic route into parking areas shall be maintained at all times. Existing pedestrian pathways shall remain open and unobstructed at all times.

2. It shall be the responsibility of the General CONTRACTOR to obtain any permits required from the Michigan Department of Transportation and City of Ann Arbor and pay all associated fees.

3. The CONTRACTOR shall be responsible for removal of snow in areas of the CONTRACTOR's work.

4. The CONTRACTOR will not disturb the OWNER's operation and maintenance of the dam without a written and approved plan.

G. Equipment Lockouts.

1. Power feet to Gate #4 shall be locked out jointly by the CONTRACTOR and OWNER.

2. Lockouts shall not be removed without agreement by the CONTRACTOR and OWNER.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01210

ALLOWANCES

PART 1 - GENERAL

1.1 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. In advance of beginning additional work, the CONTRACTOR shall submit a detailed proposal to indicate the work to be performed.

B. The OWNER will review the proposal within 10 days, and determine whether or not to authorize the additional work.

1.4 OWNER'S INSTRUCTIONS

A. Before commencement of additional proposed work, the CONTRACTOR shall notify the OWNER of additional scope.

B. Allowances will be used only as directed by the OWNER for his purposes, and only by Change Orders which designate amounts to be charged to the allowance.

C. 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.

D. 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. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related construction activities.

3.2 CASH ALLOWANCE

A. Include in the Contract Price a cash allowance of $20,000 for additional un-anticipate work.

B. The cash allowance will not be applied to any items identified in the Drawings or Specifications, or to related items that are required to provide a finished and complete product as specified.

END OF SECTION

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. 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.

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 six (6) 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.

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. Occupancy permits and similar approvals.

2. Warranties (guarantees) and maintenance agreements.

3. Test records.

4. Maintenance instructions.

5. Start-up performance reports and inspection reports.

6. Changeover information related to OWNER's occupancy, use, operation and maintenance.

7. Final cleaning.

8. Application for reduction of retainage, and consent of surety.

9. Advice on shifting insurance coverage.

10. List of incomplete work, recognized as exceptions to ENGINEER's Certificate of Substantial Completion.

11. 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 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 parities 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 parities 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 01370

LEAD BASED PAINT REMOVAL

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. The scope of work for this project covers the supplying of all labor, tools, materials, equipment, services and appurtenances to accomplish the work described below and shown on the Drawings. The work shall be performed to the complete satisfaction of the OWNER or the ENGINEER, in accordance with the current EPA and OSHA regulations, State Labor and Industry and Department of Environmental Resources regulations (if applicable) and any other applicable state and local government.

B. Work under this project includes but is not limited to the following:

1. Demolition and removal of lead-based paint materials. For the purposes of bidding, it shall be assumed that all materials are coated with lead-based paint

2. The CONTRACTOR will be responsible for the abatement and demolition of any lead-based paint materials and any other painted surfaces in the locations identified above to the extent needed to properly remove and dispose of the items.

3. The CONTRACTOR will be responsible for the abatement of any other lead-based paint that is disturbed as part of any demolition work or new work included in this project.

4. The CONTRACTOR will be responsible for the removal, storage, transportation, and disposal of all lead-based paint and hazardous materials generated by this work.

5. Existing paint has been determined to contain lead. Available lead testing results are provided in **Appendix A**.

6. Coordination of all lead-based paint abatement work with the OWNER and the CONTRACTOR.

1.2 CONTROL OF WORK

A. All work which does not conform to the requirements of this Section will be considered unacceptable.

B. Unacceptable work, whether the result of poor workmanship, use of defective materials, damage through carelessness, or any other cause found to exist prior to the final acceptance of the work, shall be removed immediately and replaced in an acceptable manner.

C. If the OWNER or ENGINEER finds the materials furnished or the work performed has resulted in an unacceptable finished product the affected work or material shall be removed and replaced or otherwise corrected by and at the expense of the CONTRACTOR.

1.3 STIPULATIONS

A. For bidding and project execution purposes, it shall be assumed that all existing surfaces are coated with lead based paint (LBP).

B. The procedures specified in this section are guidelines for minimum performance. The CONTRACTOR is responsible for his own methods of operations and conformance to regulatory codes, rules and guidelines. The CONTRACTOR is required to obtain all permits, licenses and approvals (if required) to perform the work, including any rights to use patented systems.

1.4 QUALITY ASSURANCE

A. Compliance with Standards and Regulations

1. The CONTRACTOR is solely responsible for compliance with all Federal, State, and Local laws and regulations and all Industry Standard practices associated with the abatement, demolition, storage, transport, and disposal of Hazardous Wastes, as well as all general conditions, special conditions, and all other sections within the contract document.

2. CONTRACTOR shall demonstrate to the satisfaction of the OWNER or ENGINEER that the project was completed in accordance with this Section and any applicable EPA arid MDEQ standards and regulations.

B. Worker Requirements

1. The CONTRACTOR shall furnish proof that each employee has had previous instruction on the hazards of lead exposure, on use and fitting of respirators, on protective dress, on use of decontamination procedures, on entry and exit from work areas, and on all aspects of work procedures and protective measures and all other requirements.

2. Submit verification, signed by an occupational health physician, that each employee has been recently examined as required by OSHA regulations. Medical examination will be required prior to entering the work area.

3. Submit names and training certificates of the superintendent and foreman who will be performing work related to this project.

4. Provide verification that the CONTRACTOR has provided the following information to the examining physician:

a. A copy of OSHA Standard (29 CFR 1910.1025)

b. A description of the affected employee's duties as they relate to the employee's exposure.

c. The employee's current or anticipated exposure level.

d. A description of any personal protective and respiratory equipment to be used.

e. Prior lead determination and information from previous medical examinations of the affected employee that is not otherwise available to the examining physician.

1.5 PLACEMENT OF WARNING SIGNS

A. Post warning signs in and around the work area. Locate signs at such a distance that personnel may read the sign and take necessary protective steps required before entering the work area.

B. Inform other employers on-site of the nature of the CONTRACTOR's work and requirements pertaining to regulated areas in order to comply with OSHA regulation 29 CFR 1910.120. Such notification shall be coordinated with, and approved by the OWNER.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 LEAD ABATEMENT

A. All demolition and abatement work to be coordinated with OWNER so as not to disrupt operation of the dams or run of river flow.

B. The CONTRACTOR shall protect all process equipment from lead dust during abatement.

C. The CONTRACTOR shall be responsible for the removal, storage, transportation, and dispose of all lead based paint materials.

3.2 REMOVAL

A. Removal work shall not commence until:

1. Work has been coordinated with the OWNER.

2. Arrangements have been made for disposal of waste at an acceptable site.

3. Work areas and parts of the building required to remain in use are effectively segregated.

4. Tools, equipment, and material waste receptors are on hand.

5. Arrangements have been made for building security.

6. All preparatory steps have been taken and applicable notices posted and permits obtained (if required).

3.3 DAMAGES

A. The CONTRACTOR shall protect adjacent areas from contamination.

3.4 DAILY CLEANUP

A. A thorough cleanup of the entire area under active abatement shall occur daily during the entire abatement process

3.5 STORAGE OF LIQUID AND SOLID WASTE

A. The CONTRACTOR must make provisions for the safe storage of waste on-site prior to disposal. For safety reasons, waste storage areas must be treated as abatement areas and access restricted.

3.6 CONTROLLING OFFSITE DISPERSAL

A. Basic control measures to minimize the dispersal of lead dust and debris from the work area are:

1. Control and limit access to the abatement work areas.

2. Limit tracking of dust and debris.

3. Implement a program of ongoing cleanup.

3.7 CLEANUP AND CLEARANCE TESTING

A. The CONTRACTOR shall perform air, wipe, water, and/or Toxicity Characteristics Leaching Procedure (TCLP) sample collection during the abatement under the supervision of the OWNER or the ENGINEER.

B. Final cleanup shall proceed as follows:

1. The entire abatement area shall be washed down with a Tri-Sodium Phosphate (TSP) solution. To avoid recontaminating the cleaned area, this solution should be changed according to the manufacturer's recommendations. The dirty water from this operation is considered hazardous and shall be disposed of in watertight containers.

C. After this phase of the final cleanup is complete, a visual inspection will be performed by the OWNER or the ENGINEER to ensure that all visible dust and debris have been removed from the work surfaces and the work area. Any unsatisfactory results will cause the CONTRACTOR to re-clean the affected surfaces until the inspector is satisfied with the results.

D. Clearance testing may now take place by taking wipe samples of the abated area. The clearance criterion is 200 micrograms per square foot. Clearance testing is the responsibility of the CONTRACTOR.

E. Any areas which do not meet these criteria shall be re-cleaned and restested until the standards are met.

3.8 DISPOSAL OF LEAD WASTE

A. The lead paint chips, all wastewater from cleaning operations, all plastic used for containment, and all rags, cloths or sponges used for cleaning shall be disposed of as hazardous waste. These materials shall be removed in sealed, labeled containers at an authorized disposal site in accordance with all applicable hazardous waste regulations.

B. The waste materials shall be handled as potentially hazardous waste in accordance with applicable sections of the Natural Resources and Environmental Protection Act, 1994 PA 451. No separate payment for disposal shall be made and the cost of this work is to be included in the work. The CONTRACTOR shall furnish to the OWNER a certificate of disposal of this material at an appropriate disposal facility, issued by the office of the receiving disposal facility.

C. A waste manifest shall be forwarded to the OWNER after the disposal.

END OF SECTION

SECTION 01420

REFERENCES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Reference Standards

B. Abbreviations and Acronyms

1.02 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.

1.03 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

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 01500

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Temporary Utilities

1. Temporary Electricity
2. Temporary Lighting for Construction Purposes
3. Temporary Water Service
4. Temporary Sanitary Facilities

B. Temporary Controls

1. Dust Control
2. Barriers
3. Protection of the Work
4. Security measures
5. Water control

C. Removal of utilities, facilities, and controls.

1.2 TEMPORARY ELECTRICITY

A. A single 120V outlet is available at the project site for the CONTRACTOR's use. Electrical needs beyond this shall be provided for by the CONTRACTOR.

B. Provide and pay for additional power service required from utility source as needed for construction operation.

C. Provide temporary electric feeder from electrical service at location as directed. Provide all necessary meters, disconnections, transformers, etc. A separate meter shall be installed by the CONTRACTOR for the purpose of establishing compensation for electrical power usage.

D. Complement existing power service capacity and characteristics as required.

E. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.

F. Provide main service disconnect and over-current protection at convenient location.

1.3 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. As required, 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 WATER SERVICE

A. Potable water is not available at the construction site. CONTRACTOR shall provide his own water source as needed.

1.5 TEMPORARY SANITARY FACILITIES

A. At the time of project mobilization, provide and maintain required sanitary facilities Provide chemical toilets and provisions for replacement of chemicals and disposal of wastes for the duration of the contract.

1.6 DUST CONTROL

A. No dust migration off site shall be permitted.

B. All haul roads, detour roads, and other public and private roads, driveways and parking lots used by the CONTRACTOR must be maintained in a dust free condition for the duration of this Contract. The control of the dust shall be accomplished by the application of dust control materials and methods of application as approved and as directed by the ENGINEER. Such dust control materials shall be applied as often as is necessary to control the dust.

C. Should the CONTRACTOR be negligent of his duties in providing dust control, the OWNER may, with or without notice, cause the same to be done and deduct the cost of such work from any monies due or to become due the CONTRACTOR under this Contract, but the performance of such work by the OWNER, or at his insistence, shall service in no way to release the CONTRACTOR from his liability for dust control.

D. Dust Palliative may be any of the following:

1. Water, as required.

2. Other methods as approved by the ENGINEER.

D. Street Cleaning

1. CONTRACTOR shall provide street cleaning with water for City and plant roads and parking areas affected by spillage of excavated material or other material associated with the work.

2. CONTRACTOR shall provide street cleaning by the end of each workday when spillage has occurred, and upon request by OWNER.

3. CONTRACTOR shall sweep and clean City streets adjacent to water plant site when there is visible dust or debris on the street surfaces that came from the construction site, from vehicles coming to or from the construction site, or is in any way associated with CONTRACTOR's work on this contract.

1.7 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.

1.8 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 walkways, 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.

1.9 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 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 OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article.

1.4 PRODUCT SUBSTITUTION PROCEDURES

A. Instructions to Bidders specify requirements for submitting requests for Substitutions during the bidding period. This section specifies procedures and requirements affecting substitutions proposed by the CONTRACTOR after the Contract Date.

B. Where the term "substitutions" is used in this section, it means materials, equipment, or methods of construction which differ from the requirements in the Contract Documents. The term "substitutions" does not include:

1. Requirements provided by Addenda issued prior to the Contract date.

2. Changes made at the direction of ENGINEER.

3. Changes ordered by governing authorities.

4. Options described in the Contract Documents.

C. Substitutions will be considered in the event that:

1. They are related to "or equal" or "or approved equal" provisions in the Contract Documents.

2. The specified requirements cannot be provided within the Contract Time due to causes beyond the CONTRACTOR's control.

3. The OWNER will gain a substantial advantage if substitutions are approved.

4. Substitutions will be considered when a product becomes unavailable through no fault of the CONTRACTOR.

D. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

E. A request constitutes a representation that the CONTRACTOR:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.

2. Will provide the same warranty for the Substitution as for the specified product.

3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to OWNER.

4. Waives claims for additional costs or time extension which may subsequently become apparent.

5. Will reimburse OWNER and/or ENGINEER for review or redesign services associated with re-approval by authorities.

6. Will reimburse the OWNER and/or ENGINEER for any costs incurred in the evaluation of any “or equal” or substitution proposal. Such costs shall include, but are not limited to, related charges of the ENGINEER made necessary by the evaluation and acceptance or rejection, as the case may be, of the proposed “or equal” or substitute material or equipment.

F. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

G. Substitution Submittal Procedure:

1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.

2. Submit Shop Drawings, Product Data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.

3. Submit itemized comparison between the specified product and the substitution product demonstration equivalent.

4. The ENGINEER will notify CONTRACTOR, in writing, of decision to accept or reject request.

5. Such submittals do not relieve the CONTRACTOR of obligation to later furnish Shop Drawings, product data, samples, and other submittals required by the Contract Documents.

H. If any “or equal” or substitute material or equipment differs materially from the material or equipment named or specified, and that difference was not expressly identified in the CONTRACTOR’s request, or results in changes in the work, the ENGINEER has authority to require removal and replacement of that “or equal” or substitute material or equipment. The CONTRACTOR shall bear the delay and costs resulting from (a) any such removal and replacement of “or equal” or substitute materials or equipment; (b) making “or equal” or substitute materials or equipment conform to the requirements of the Contract Documents; and (c) any changes in the work and/or in other work required to accommodate the “or equal” or substitute material or equipment, or both.

1.5 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.

1.6 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.

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 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. Hose clean sidewalks and loading 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. Clean, wax and polish wood, vinyl, and painted floors.

9. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, and similar spaces.

11. Remove tags and labels that are not permanent.

12. 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.

13. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

14. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

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. 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. Advise OWNER of pending insurance changeover requirements.

4. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.

5. Obtain and submit releases enabling OWNER unrestricted use of the work and access to services and utilities; include occupancy permits, operating certificate, and similar releases.

6. Complete final cleanup requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

7. Provide all required demonstration and training sessions.

C. 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 for 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 final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion, or when OWNER took possession of and responsibility for corresponding elements of the work.

5. Submit consent of surety to final payment.

6. Submit a final liquidated damages settlement statement.

7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

8. Submit record drawings, maintenance manuals, damage or settlement survey, property survey, and similar final record information.

9. Deliver tools, spare parts, extra stock, and similar items.

10. Make final changeover of permanent locks and transmit keys to OWNER. Advise OWNER's personnel of changeover in security provisions.

11. Complete commissioning and training of OWNER's personnel.

12. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.

13. 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 bet 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 01780

CLOSEOUT SUBMITTALS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Project Record Documents

B. Spare Parts and Maintenance Products

C. Preventative Maintenance Instructions

E. Warranties and Bonds

1.2 PROJECT RECORD DOCUMENTS

A. Maintain on site one clean, undamaged set of the following record documents; record actual revisions to the Work:

1. Drawings.

2. Specifications.

3. Addenda.

4. Change Orders and other modifications to the Contract.

5. Reviewed Shop Drawings, Product Data, and Samples.

6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by OWNER.

C. Store record documents separate from documents used for construction.

D. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:

1. Manufacturer's name and product model and number.

2. Product substitutions or alternates utilized.

3. Changes made by Addenda and modifications.

E. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:

1. Measured depths and elevations.

2. Measured horizontal and vertical locations.

3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the work.

4. Measured horizontal and vertical locations of all concealed and exposed electrical conduits. Conduits shall be shown in plain view on the Record Drawings with their size and contents indicated.

5. Field changes of dimension and detail.

6. Details not on original Contract Drawings.

F. Indicate the date of revisions to the plans in the appropriate box on the plans.

G. Submit documents to ENGINEER with claim for final Application for Payment.

1.3 PREVENTATIVE MAINTENANCE SCHEDULE

A. Submit, in addition to the operation and maintenance data, an equipment maintenance schedule for each piece of equipment. Include the following:

1. Identity of Equipment.

2. Routine manufacturer recommended preventative maintenance

a. Daily

b. Weekly

c. Monthly

d. Quarterly

e. Semi-Annually

f. Annually

B. Equipment maintenance schedule in standard manufacturer format for all equipment.

1.4 WARRANTIES AND BONDS

A. Obtain warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers. All warranties shall begin at the Date of Substantial Completion, or at the date of acceptance by the OWNER, whichever is later.

B. Execute and assemble all transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers into one binder.

C. Verify that documents are in proper form, contain full information, and are notarized. Manufacturer's warranties shall be in the name of the Owner.

D. Provide Table of Contents and assemble in three-ring binders with durable plastic cover.

E. Submit prior to Final Application for Payment.

F. Time of submittals:

1. Make warranty submittal within ten days after Date of Substantial Completion, prior to final Application for Payment.

2. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty or bond period.

G. Rejection of Warranties: OWNER reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

H. Submit warranties per Table 01780-A, Required Warranties. Where warranty requirements in the specified section or general conditions supersede the requirements of this table, the warranty requirements in the specified section or general conditions shall apply.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01810

TESTING AND MATERIALS INSPECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Gate Testing

B. Gate Startup

C. Materials Testing and Inspection

1.2 DEFINITIONS

A. Dry Testing: Dry testing is performed by the CONTRACTOR without introducing water to the gate.

B. Wet Testing: Wet testing is testing performed by the CONTRACTOR utilizing river water introduced between the stoplogs and gate. The gate is checked for water-tightness and smooth operation.

C. Performance Testing: Performance Testing is testing performed by the CONTRACTOR after the stoplogs have been removed.

D. Manufacturer's Checkout: Manufacturer's checkout shall be performed directly by the manufacturer. Checkout by the local equipment representative or salesman is not permitted. Checkout shall include, but not be limited to, wiring and power supply, installation, tolerances, clearances, rotation, etc.

E. Startup: Startup shall be defined as the operation of gate using river water as necessary to demonstrate the operation of the equipment. Startup shall be performed by the CONTRACTOR, manufacturer, and local equipment representative.

F. System: A "system" includes all required items of equipment, devices, and appurtenances connected so that their operation or function compliments, protects, or controls the operation or function of the others.

1.3 SUBMITTALS

A. Field Installation Reports – Submit reports by Manufacturer's Representative in accordance with the Contract Documents.

B. Start up and Testing Documentation: CONTRACTOR shall prepare and submit all documentation for review and approval. The documentation shall include, but not be limited to, the following:

1. Dry testing plans and wet testing plans that describe in detail the proposed testing procedures that will show the equipment and systems performance is in accordance with the requirements of the Contract Documents.

2. Dry testing and wet testing reports including recorded test data, performance tolerances, observations, measurements taken, problems and modifications or corrective action taken for the equipment and systems to perform in accordance with the Contract Documents.

3. Certification by the preparer that he/she is the person responsible for the data, and that the data is authentic and accurate.

4. Certification by the CONTRACTOR or equipment or unit process systems supplier that the equipment or the unit process systems were operated continuously for the specified period and that the equipment or unit process systems operated in compliance with the specified operating conditions, parameters and performance.

C. Testing Schedule: Provide a testing schedule that sets forth the planned sequence for performance testing and operational demonstration work. Testing schedule shall be part of the Progress Schedule and shall conform to requirements for Progress Schedule.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 GATE TESTING

A. The CONTRACTOR shall perform all testing as required to ensure a proper functioning tainter gate installation.

B. The following procedures shall serve as a guideline for the CONTRACTOR's testing activities, but the CONTRACTOR shall perform additional testing as required to ensure a proper functioning gate.

1. Fabricator's checkout shall be performed after the gate is installed, but before it is moved. Fabricator shall ensure that all new components interface with the existing hoist and concrete structures.

2. Dry testing shall be performed to ensure proper tolerances are maintained and the gate motion is smooth and unimpeded through its full range of motion.

3. Wet testing shall check for leak free condition in the closed position and shall be used for seal or other adjustments as needed. Smooth opening under static head shall be checked. The gate shall be opened and closed a minimum of 10 times under initial static head, then moving through the full range of motion.

4. Performance testing shall be completed with the stoplogs removed. The gate shall be checked for smooth operation and flow control.

C. The OWNER's operating and maintenance staff shall be allowed to observe for the purposes of familiarization and training.

D. Modifications to the equipment and unit process systems required to meet testing requirements shall be provided, and all retesting shall be performed at no additional cost to the OWNER.

E. CONTRACTOR shall provide fuel, compressed air, temporary conduit, cable and wire, piping and appurtenances, and all other items and Work as required for testing.

3.2 GATE STARTUP

A. The CONTRACTOR and Manufacturer's Representative shall inspect equipment and systems prior to each start-up and verify their readiness for start-up. Conditions hazardous to equipment or personnel shall be corrected by the CONTRACTOR prior to start-up of equipment.

B. Start-up operations shall not precede using temporary power or temporary instrumentation and control wiring. All electrical and control connections shall be permanent and complete, and all such electrical components and equipment fully functional.

C. Use of repair parts during start-up operations shall not be permitted, except in such situations where the actual on-site verification of such repair parts' operability is specified.

D. The CONTRACTOR shall verify that all initial copies of the maintenance and operating instructions have received, from the ENGINEER, an acceptable disposition as defined in Section 01330, Submittal Procedures, and the only outstanding item is the field verification of the maintenance and operating instructions.

E. CONTRACTOR shall compare, and make adjustments to conform to; the Manufacturer's recommendations for the following minimum start up requirements:

1. Bearings and Shafting:

    a. Inspect for cleanliness, and clean and remove foreign matter.

    b. Verify alignment.

    c. Replace defective bearings and those that operate rough or noisy.

    d. Grease as necessary, in accordance with Manufacturer's recommendations.

2. Remove rust, scale, and foreign matter from equipment and renew defaced surfaces.

3.3 MATERIALS TESTING AND INSPECTION

A. Paint Inspection

1. The CONTRACTOR, at his own expense, shall hire an independent inspector to provide testing and verification of proper surface preparation and proper environmental conditions including ambient and surface temperatures, humidity and dewpoint. Surface preparation and environmental conditions shall be verified for each coat. Painting will not be permitted to proceed without demonstration of said factors to the OWNER. In addition, the independent inspector shall verify thickness of all coatings and shall check for surface defects including runs, holidays, bubbling, etc.

2. The independent inspector shall provide inspection reports to the CONTRACTOR and ENGINEER.

3. Approved testing companies are: Dixon and Nelson.

B. Weld Inspection

1. The CONTRACTOR, at his own expense, shall hire an independent inspector to provide testing and verification for welds. Welds shall be visually inspected for flaws and defects according to the AWS D1.1 standard. In addition, the independent inspector shall perform twenty four (24) magnetic particle tests on the gate in representative areas or as designated by the ENGINEER.

2. Weld testing shall be performed after removal of slag and necessary cleaning, but before application of coatings.

3. The independent inspector shall provide inspection reports to the CONTRACTOR and ENGINEER.

C. Concrete Inspection

1. The CONTRACTOR, at his own expense, shall hire an independent inspector to provide testing and verification for all concrete placed. Every load of concrete shall be tested for: slump, % entrained air, temperature and strength (5 cylinders per load).

2. The independent inspector shall provide inspection reports to the CONTRACTOR and ENGINEER.

D. Bolt torque verification

1. The CONTRACTOR, at his own expense, shall hire an independent inspector to provide verification of bolt torques.

2. The independent inspector shall provide inspection reports to the CONTRACTOR and ENGINEER.

END OF SECTION

SECTION 02220

DEMOLITION

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Demolition and removals of existing materials, equipment, or work necessary to complete the Work as shown and specified.

B. Demolitions and removals, which may be specified under other Sections, shall conform to requirements of this Section.

1.2 RELATED SECTIONS

A. Section 01440 – Work Restrictions

1.3 REFERENCES

A. Comply with all applicable requirements of the following reference standards:

1. OSHA Standard, Title 29, Code of Federal Regulations, Part 1926, Section .850 through .860.

2. OSHA Standard, Title 29, Code of Federal Regulations, Part 1926, Section .650.

3. OSHA Standard, Title 29, Code of Federal Regulations, Part 1926, Section .62 – Lead Standard.

4. MDOT, 2012 Standard Specifications for Construction.

5. United States Environmental Protection Agency (USEPA) Publication SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, henceforth SW-846.

1.4 SUBMITTALS

A. Submit a Demolition Plan in accordance with Section 01330 – Submittal Procedures. Demolition plan shall describe the proposed sequence, methods and equipment for demolition, removal and disposal of tainter gate and related items. Plan shall include lead abatement procedures.

B. Demolition plan shall include a schedule.

C. Do not proceed with demolition until the OWNER has approved the demolition plan.

1.5 DELIVERY, STORAGE, AND HANDLING

A. CONTRACTOR is responsible for determining the applicability of disposal locations for debris generated throughout the course of Work.

B. CONTRACTOR is responsible for all analytical testing required by the disposal facilities that CONTRACTOR receives approval from for debris disposal.

1.6 PROJECT CONDITIONS

A. The existing tainter gate is assumed to contain lead based paint based on previous tests taken at the site. Results are included in **APPENDIX A**.

B. Unknown Conditions: Should unforeseen facilities be encountered during demolition, notify the ENGINEER immediately. Cooperate with utility OWNER in keeping adjacent services and facilities in operations. Repair damaged utilities immediately.

B. Perform demolition and removal Work to prevent damage or injury to structures, occupants thereof, and adjacent features which might result from falling debris or other causes, and so as not to interfere with the use, and free and safe passage to and from adjacent structures.

1. Closing or obstructing of roadways, sidewalks, and passageways adjacent to the Work by the placement or storage of materials will not be permitted, and all operations shall be conducted with a minimum interference to traffic on these ways.

2. Erect and maintain barriers, lights, sidewalk sheds, and other necessary protective devices.

3. Repair damage to facilities to remain, or to property belonging to the OWNER or occupants of the facilities.

4. CONTRACTOR shall stop demolition work if demolition debris falls outside of the work limits and shall clear away the debris immediately. Demolition work may resume once debris outside of the work limits is removed. CONTRACTOR shall notify the ENGINEER of debris outside of the work limits. The CONTRACTOR shall prevent debris of any kind from entering the river.

PART 2 – PRODUCTS

SECTION NOT USED

PART 3 – EXECUTION

3.1 GENERAL

A. All materials and equipment removed from existing work shall become the property of CONTRACTOR, except for those which OWNER has identified and marked for their use. All materials and equipment marked by the OWNER to remain the property of the OWNER shall be carefully removed by CONTRACTOR so as not to be damaged, and shall be cleaned and stored on or adjacent to the Site in a protected location specified by the ENGINEER or loaded onto trucks provided by the OWNER.

B. CONTRACTOR shall dispose all demolition materials, equipment, debris, and all other items not marked by the OWNER to remain, off the Site and in conformance with all existing applicable laws and regulations.

C. CONTRACTOR shall remove demolition materials from the site daily. CONTRACTOR shall not stockpile materials or equipment on-site.

D. Concrete or other areas which are exposed by any of the removals specified herein, and which will remain as architecturally finished surfaces shall be repaired and re-finished by CONTRACTOR with the same or matching materials as the existing adjacent surface or as may be otherwise approved by the ENGINEER.

E. Pollution Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level. Comply with governing regulations pertaining to environmental protection.

1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

2. Clean adjacent structures, facilities, and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to conditions existing prior to the start of the Work.

3.1 CONCRETE REMOVALS

3.2 STEEL REMOVALS

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.1 DESCRIPTION

A. Concrete work shall include the furnishing of all labor, materials, formwork, reinforcing, tools and equipment required to manufacture, transport, place, protect, repair, cure, and finish all concrete work for a complete and functioning installation in accordance with the Contract Documents.

B. The CONTRACTOR shall be responsible for all items (openings, rebar, sleeves, inserts, anchorages, etc.) shown on the Plans and those which may not be shown on the Plans but are required to be placed in the concrete work.

C. Progress of Work

1. If unacceptable concrete strength or air content occurs and additional testing or remedial actions or modifications are required, further concrete work will not be permitted until such testing has revealed the probable cause of the low strength or low air levels and a program of remedial actions or modifications has been implemented.

1.2 DEFINITIONS

A. The following supplemental definitions cover the meanings of certain words and terms as used in this Section.

1. Reviewed or Permitted: Reviewed by the OWNER and/or OWNER's REPRESENTATIVE.

2. Exposed Construction: Exposed to view. Situated so that it can be seen from eye level from any location after completion of the structure.

3. Normal Weight Concrete: Concrete for which density is not a controlling attribute, made with aggregates of the types covered by "Specification for Concrete Aggregates" (ASTM C-33), and having unit weights in the range of 135 to 160 lb/cu ft.

B. Other words and terms used in these specifications are defined in Cement and Concrete Terminology (ACI-SP-19).

1.3 STANDARDS

A. The latest edition of the standards from the American Society for Testing and Materials, American Concrete Institute, American Welding Society, and Concrete Reinforcing Steel Institute, referred to in these Specifications, are listed below with their serial designation and are declared to be a part of these Specifications, the same as if fully set forth herein, except as modified in this Specification.

1. American Society for Testing and Materials, 1916 Race St., Philadelphia, PA 19103:

A 82-85 Standard Specification for Cold-Drawn Steel Wire for Concrete Reinforcement

A 184-86 Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement

A 185-85 Standard Specification for Welded Steel Wire Fabric for Concrete Reinforcement

A 496-85 Standard Specification for Deformed Steel Wire for Concrete Reinforcement

A 497-86 Standard Specification for Welded Deformed Steel Wire Fabric for Concrete Reinforcement

A 615-87 Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

C 31-87a (1980) Standard Method of Making and Curing Concrete Test Specimens in the Field

C 33-86 Standard Specification for Concrete Aggregates

C 39-86 Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens

C 42-84a Standard Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

C 94-86b Standard Specification for Ready-Mixed Concrete

C 109-86 Standard Method of Test for Compressive Strength of Hydraulic Cement Mortars (using 2-inch (50-mm) cube specimens)

C 138-81 Standard Method of Test for Unit Weight Yield, and Air Content (Gravimetric) of Concrete

C 143-78 Standard Method of Test for Slump of Portland Cement Concrete

C 144-87 Standard Specification for Aggregate for Masonry Mortar

C 150-86 Standard Specification for Portland Cement

C 172-82 Standard Method of Sampling Fresh Concrete

C 173-78 Standard Method of Test for Air Content of Freshly Mixed Concrete by the Volumetric Method

C 192-81 Standard Method of Making and Curing Concrete Test Specimens in the Laboratory

C 231-82 Standard Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method

C 260-86 Standard Specification for Air-Entraining Admixtures for Concrete

C 309-81 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

C 387-87 Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete

C 494-86 Standard Specification for Chemical Admixtures for Concrete

D 994-71 Standard Specification for Pre formed expansion Joint Filler for Concrete (Bituminous Type)

D 1751-83 Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)

E 329-77 Standard Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction

2. American Concrete Institute, Box 19150, Redford Station, Detroit, Michigan 48219

SP-1 5 Field Reference Manual: Specifications for Structural Concrete for Buildings ACI 301-89 with Selected ACI and ASTM References, 1989.

ACI 116 Cement and Concrete Terminology.

ACI 211.1 Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete

ACI 212.3 Chemical Admixtures in Concrete

ACI 214 Recommended Practice for Evaluation of Strength Test Results of Concrete (Reapproved for 1989)

ACI 302.1 Guide for Concrete Floor and Slab Construction

ACI 303 Guide to Cast-In-Place Architectural Concrete Practice

ACI 304 Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete (Revised 1982)

ACI 302 Placing Concrete by Pumping Methods

ACI 305 Hot Weather Concreting

ACI 306 Cold Weather Concreting

ACI 308 Standard Practice for Curing Concrete

ACI 309 Recommended Practice for Consolidation of Concrete

ACI 31 5 Details and Detailing of Concrete Reinforcement (Revised 1986)

ACI 318 Building Code Requirements for Reinforced Concrete (Revised 1987)

ACI 318.1 Building Code Requirements for Structural Plain Concrete

ACI 347 Recommended Practice for Concrete Formwork

ACI 350 Concrete Sanitary Engineering Structures

ACI 503 Use of Epoxy Compounds with Concrete

3. American Welding Society, 550 N.W. LeJenne Road, P.O. Box 351040, Miami, FL 33135; “Structural Welding Code - Reinforcing Steel” (AWS D1.4-79).

4. Concrete Plant Manufacturers Bureau, 900 Spring Street, Silver Spring, MD 20910: “Concrete Plant Mixer Standards of the Plant Mixer Manufacturer’s Division”.

5. National Ready Mix Concrete Association, 900 Spring Street, Silver Spring, MD 20910:
“Check List for Certification of Ready Mixed Concrete Production Facilities”.

6. Concrete Reinforcing Steel Institute, 228 North LaSalle Street, Chicago, Illinois 60601: “Placing Reinforcing Bars,” and “Reinforcement Anchorages and Splices,” latest editions.

B. Field Reference Manual

1. The CONTRACTOR shall keep at least one copy of “Specifications for Structural Concrete for Buildings (ACI 301) with Selected ACI and ASTM References “ACI Field Reference Manual SP-15, in the field office at all times.

1.4 SUBMITTAL REQUIREMENTS

A. Shop Drawings: Submit in accordance with the General Conditions, covering the items included under this Section.

1. Shop Drawings of Reinforcement: Submit original Shop Drawings for fabrication, bending, and placement of concrete reinforcement. Comply with Reinforcement Shop Drawing Checklist below as applicable:

a. Reinforcement Shop Drawing Checklist:

1) Specify ASTM number and grade of reinforcing on submitted Shop Drawings (e.g., ASTM A 615, Grade 60).

2) Specify clear coverages and bar support spacing per Placing Reinforcement Specification in Article 2.09.

3) Specify lap lengths as shown on the Structural Drawings.

4) Submit Bar Bending Schedule.

5) Use closed stirrups and ties with 135-degree hooks, unless noted otherwise in Drawings.

6) Specify major Contract reference Drawings on submitted detail sheets. Use same section cut numbers and letters when practical.

7) Show stirrup spacing.

8) Show details for additional reinforcing items. Examples are reinforcing around openings, control joints, equipment pads, masonry reinforcement.

9) Show numeric elevation references on sections shown on submitted Shop Drawings.

10) Locate expansion and control joints.

11) Organize and present sheets in logical sequence.

12) Submit "small" submittal packages when practical.

13) Show inside and outside or near face and far face on walls.

14) Show bar spacings and quantities on Shop Drawing submittals.

15) Immediately contact OWNER and/or OWNER's REPRESENTATIVE if Contract Documents are unclear.

16) For epoxy coated reinforcement, coating applicator must furnish written certification that the coated reinforcing bars were cleaned, coated, and tested according to ASTM D3963.99.

b. Mix Designs: Submit the following for all concrete classes:

1) Water/cement ratio (total gallons of water per cubic yard)

2) Brand, type, and quantity of cement

3) Type and quantity of aggregates

4) Type and quantity of admixtures

5) Unit weight (wet density)

6) History of composition strength based on 28-day compression test. Test reports shall be current and within 90 days of submittal. Concrete supplier must demonstrate a familiarity with his supplied mix.

7) Submit laboratory test reports and certification letters for concrete mix design, cement, aggregates (particularly deleterious materials in coarse aggregate), four weeks before scheduled pouring.

B. Product Data: Submit data for proprietary materials and items, including admixtures, patching compounds, waterstops, joint systems, curing compounds, and other materials installed under this Section.

C. Submit samples of materials as requested by OWNER and/or OWNER's REPRESENTATIVE, including names, sources and descriptions.

D. Quality Assurance Submittals:

1. Submit written reports to ENGINEER documenting testing and inspection results.

2. Submit mill test reports on reinforcement.

3. Submit materials certificates in lieu of laboratory test reports on other materials. Manufacturer and CONTRACTOR shall sign material certificates certifying that each material item complies with, or exceeds, specified requirements. Submit certification from admixture manufacturers that chloride content complies with specification requirements.

3. CONTRACTOR shall be experienced with the placement, finishing, and curing of the specified concrete mixes and admixtures, and provide a minimum of five (5) reference projects.

1.5 PROJECT CONDITIONS

A. Protection against Freezing: Cover completed Work with sufficient temporary cover to protect against possibility of freezing. Provide supplemental heat and maintain cover for curing period or until temperatures cannot affect concrete.

B. Protect adjacent finish materials against spatter during concrete placement.

1.6 MANUFACTURERS

A. Subject to compliance with the specified requirements, manufacturers which may be incorporated in Work include:

1. Air-Entraining Admixture:

   a. AEA 15, Sika Corp.

2. Corrosion Inhibitor and Bonding Agent:

   a. Armatech 110-EpoCem, Sika Corporation

3. Mid-Range Water-Reducing Admixture:

   a. "Plastocrete 161", Sika Chemical Corporation

4. Non-Shrink Grout:

   a. Dayton-Superior

   b. Euclid Chemical Co.

   c. Master Builders

   d. U.S. Grout Corporation

5. Chemical Hardener:

   a. "Burk-O-Lith", The Burke Co.

   b. "Day-Chem Hardener", Dayton-Superior

   c. "Surfhard", Euclid Chemical Co.

   d. "Mastertop CST", Master Builders

   e. "Lapidolith", Sonneborne-Rexnord

6. Moisture-Retaining Cover:

   a. Polyethylene-coated burlap.

7. Brush and Float Waterproof Finish:

   a. "Thoroseal", Standard Dry Wall Products.

8. Adhexive Anchors:

   a. “HIT ICE”, Hilti Systems

PART 2 - PRODUCTS

2.1 CEMENT

A. Cement shall be Portland cement Types I or III, and shall conform to ASTM C150 and contain less than 0.60 percent alkalies. Different cements shall not be used interchangeably in the same element or portion of the work.

2.2 ADMIXTURES

A. The following admixtures will be permitted or required in the concrete as stated.

1. Air-entraining admixture conforming to ASTM C260.

2. Water reducing, retarding and accelerating admixtures conforming to ASTM C494 will be permitted in concrete made with Type I Cement. Water reducing admixture conforming to ASTM C494 will be permitted in concrete made with Type III Cement.

3. Fly Ash

   a. Fly ash shall be Type Class C or F, meeting the requirements of ASTM C618 and the carbon content shall be less than one percent.

B. Admixtures used in the concrete shall be of the same composition as used in establishing the required concrete proportions (See paragraph 2.07 of this Section of the Specifications).

C. Calcium chloride or admixtures containing calcium chloride will not be permitted in the concrete work.

D. The name, manufacturer, and technical information for all admixtures shall be submitted for approval.

E. All admixtures shall be used in accordance with the manufacturer's instructions.

F. Admixtures shall be supplied by a single manufacturer to ensure compatibility.

2.3 WATER

A. Mixing water for concrete shall be fresh, clean, and free from injurious amounts of oil, acid, alkalies, salts, sewage, organic matter, or other deleterious substances and meet the requirements of ASTM C94.

2.4 AGGREGATES

A. Aggregates shall conform to ASTM C33. Coarse aggregates shall be limestone, and shall meet the grading requirements for size 67 for all concrete work unless noted otherwise.

B. Fine and coarse aggregates shall be regarded as separate ingredients. Each size of coarse aggregate, as well as the combination of sizes when two or more are used, shall conform to the appropriate grading requirements of the applicable ASTM specifications.

C. Aggregates shall be tested for reactivity. To minimize alkali-silica reactions, high alkali content shall not be permitted.

2.5 STORAGE OF MATERIALS

A. Cement shall be stored in weather-tight buildings, bins, or silos which will exclude moisture and contaminants.

B. Aggregate stockpiles shall be arranged and used in a manner to avoid excessive segregation and to prevent contamination with other materials or with other sizes of like aggregates. To insure that this condition is met, any test for determining conformance to requirements for cleanness and grading shall be performed on samples secured from the aggregates at the point of batching. Frozen or partially frozen aggregates shall not be used.

C. Natural or manufactured sand shall be allowed to drain until it has reached relatively uniform moisture content before it is used.

D. To prevent excessive variations in moisture content, predampened aggregates must remain in the stockpiles for a minimum of 12 hours before use.

E. Admixtures shall be stored in such a manner as to avoid contamination, evaporation, or damage. For those used in the form of suspensions or non-stable solutions, agitating equipment shall be provided to assure thorough distribution of the ingredients. Liquid admixtures shall be protected from freezing and from temperature changes which would adversely affect their characteristics.

F. Moisture retaining covers shall be one of the following, complying with ASTM C17:

Waterproof Paper
Polyethylene Film, Burleen

2.6 PROPORTIONING

A. General

1. Concrete for all parts of the work shall be of the specified quality capable of being placed without excessive segregation. When hardened, concrete shall develop all characteristics required by these Specifications.

2. Use Portland Cement Type I or III.

3. Fly ash shall be used to partially supplant cement content in concrete. Replacement quantity shall be not less than 15%, nor more than 20% of cement content by weight.

4. Concrete shall not have less than one inch slump as determined by ASTM C143.

5. The nominal maximum size of the aggregate shall not be more than one-fifth of the narrowest dimension between sides of forms, one-third of the depth of slabs, nor three-fourths of the minimum clear spacing between reinforcing bars.

B. Design Mixes

1. Locations for concrete classes are attached at the end of this section.

2. Properties for concrete classes are attached at end of this section.

3. Adjustment of Concrete Mixes: Mix designs may be adjusted when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, when approved by ENGINEER, at no additional cost to OWNER. Submit laboratory test data for revised mix design and strength results to ENGINEER before using in work.

4. Admixtures:

a. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete for placement and workability.

b. Use non-chloride accelerating admixture in concrete slabs placed at ambient temperatures below 50 degrees F (10 degrees C).

c. Add air-entraining admixture at manufacturer's prescribed rate to result in placed concrete having total air content specified.

d. Refer to the mix designs attached at the end of this section for other specific admixture usage.

2.7 FORMWORK

A. General

1. Forms shall be used to confine the concrete and shape it to the required dimensions. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete, and shall have sufficient rigidity to maintain specified tolerances.

2. Formwork shall conform to ACI 347.

3. Earth cuts may be used to form footings, trench footings, and mass footings provided that the cut is clean, reasonably straight, and meets the tolerances of this Section. Review by the ENGINEER is required in order to use earthcuts. If the earth cannot hold the shapes required by the Drawings these items shall be formed.

B. Design and Installation of Formwork

1. The design and engineering of the formwork, as well as its construction, shall be the responsibility of the CONTRACTOR.

2. The formwork shall be designed for the loads, lateral pressure, and allowable stresses outlined in ACI 347, Design of "Recommended Practice for Concrete Formwork" as well as for the design considerations, wind loads, allowable stresses, and other applicable requirements of the controlling local building code.

3. Requirements for facing materials are given in following items of this Section of the Specifications. The maximum deflection of facing materials reflected in concrete surfaces exposed to view shall be 1/240 of the span between structural members.

4. Forms shall be sufficiently tight to prevent loss of mortar from the concrete. Chamfer strips (1" x 1" x 1-1/2") shall be placed in the corners of forms to produce beveled edges on permanently exposed surfaces unless detailed otherwise. Interior corners on such surfaces and the edges of formed joints will not require beveling. Exposed surfaces include surfaces exposed to view or water in the finished construction.

5. Positive means of adjustment (wedge or jacks) of shores and struts shall be provided and all settlement shall be taken up during concrete placing operation. Forms shall be securely braced against lateral deflections. Formwork shall be cambered to compensate for anticipated deflections in the formwork prior to hardening of the concrete.

6. Temporary openings shall be provided at the base of column forms and wall forms and at other points where necessary to facilitate cleaning and observation immediately before concrete is placed.

7. Form accessories to be partially or wholly embedded in the concrete, such as ties and hangers, shall be of a commercially manufactured type. Non-fabricated wire shall not be used.

8. Form ties shall be constructed so that the end or end fasteners can be removed without causing appreciable spalling at the faces of the concrete. Form ties shall have cones on each end.

    a. Non-Exposed Concrete Work: After the ends or end fasteners of form ties have been removed, the embedded portion of the ties shall terminate not less than 2 diameters or twice the minimum dimension of the tie from the formed faces of concrete and in no case shall this distance be less than 3/4 inch.

    b. Exposed Concrete Work (this shall apply to areas where one or both faces of the work is exposed to view; i.e., retaining wall): Form, ties, assemblies for concrete exposed to water, influent, effluent, weather, freeze/thaw and similar exposures shall permit tightening of the forms and shall leave no metal or other material within 1-1/2 inch of the surface. The assembly should provide cone-shaped depressions at the form/concrete surface interface of at least one inch diameter and 1-1/2 inch deep to permit filling and patching. Tie shall be tight fitting or tie holes shall be sealed to prevent leakage. Single rod ties shall be equipped with a tightly fitted washer at midpoint when part of the tie is to remain in concrete exposed to liquids.

    c. Tie systems shall provide positive pressure at all joints to preclude mortar/grout leakage.

9. At construction joints, contact surface of the form sheathing for flush surfaces shall overlap the hardened concrete in the previous placement by not more than 1 inch. The forms shall be held against the hardened concrete to prevent offsets or loss of mortar at the construction joint and to maintain a true surface.

10. Wood forms for wall openings shall be constructed to facilitate loosening, if necessary, to counteract swelling of the forms.

11. Wedges used for final adjustment of the forms prior to concrete placement shall be fastened in position after the final check.

12. Formwork shall be so anchored to shores or other supporting surfaces or members that upward or lateral movement of any part of the formwork system during concrete placement will be prevented.

13. Runways for moving equipment shall be provided with struts or legs and shall be supported directly on the formwork or structural member without resting on the reinforcing steel.

14. Provide temporary openings at base of wall and column forms and other interior areas of formwork where it is inaccessible for cleanout, for observation before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.

15. Provisions for other trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing these items. Accurately place and securely support items built into forms.

C. Tolerances

1. The formwork shall be constructed so that the concrete surfaces will conform to the tolerance limits listed in Table 2.08.C.1.

Table 2.08.C.1
Tolerances for Formed Surfaces

(1) Variation from plumb:

a. In the lines and surfaces of columns, piers, walls, and in arises:

in any l0 ft of length	¼ - inch
maximum for entire length	1 inch

b. For exposed corner columns, control joint grooves and other conspicuous lines:

in any 20'- 0" length	¼ - inch
maximum for the entire length	½ - inch

(2) Variation from the level or from the grades specified in the Contract Documents:

a. In slab soffits, ceilings, beam soffits and in arises, measured before removal of supporting shores

in any 10 ft of length	¼ - inch
in any bay or any 20 ft length	⅜ - inch
maximum for entire length	¾ - inch

b. In exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines:

in any bay or in 20 ft length	¼ - inch
maximum for entire length	½ - inch

(3) Variation of the linear building lines from established position in plan and related position of columns, walls, & partitions:

in any bay	½ - inch
in any 20 ft of length	½ - inch
maximum for entire length	1 inch

(4) Variation in the sizes and location of sleeves, floor openings, & wall openings

± ¼ - inch

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

minus	¼ - inch
plus	½ - inch

(6) Footings

a. Variations in dimensions in plan:

minus	½ - inch
plus	2 inches

b. Misplacement of eccentricity:

2% of footing width in direction of misplacement but no more than 2 inches

c. Thickness:

decrease in specified thickness	0 inch
increase in specified thickness	1 inch

(7) Variation in steps:

a. In a flight of stairs:

Rise	± ⅛ - inch
Tread	± ⅛ - inch

b. In consecutive steps:

Rise	± 1/16 - inch
Tread	± ⅛ - inch

2. The CONTRACTOR shall establish and maintain in an undisturbed condition and until final completion and acceptance of the project sufficient control points and bench marks to be used for reference purposes to check tolerances.

3. Regardless of the tolerances listed in Table 208.C.1, no portion of the building shall extend beyond the legal boundary of the project.

D. Preparation of Form Surfaces

1. All surfaces of forms and embedded materials shall be cleaned of any accumulated mortar or grout from previous concreting and of all other foreign material before

concrete is placed in them. Local defects such as chipped plywood or kinks in steel forms will not be permitted.

2. Unless otherwise specified or approved, surfaces of forms shall be treated as follows:

   a. Before placing of either the reinforcing steel or the concrete, the surfaces of the forms shall be covered with an approved coating material that will effectively prevent absorption of moisture and prevent bond with the concrete, and will not stain the concrete surfaces. A field applied form release agent or sealer of approved type or a factory applied non-absorptive liner may be used.

   b. Excess form coating material shall not be allowed to stand in puddles in the forms nor shall such coating be allowed to come in contact with reinforcing steel or with hardened concrete against which fresh concrete is to be placed.

3. The CONTRACTOR shall submit the name of the form coating agent material proposed to be used with sufficient supportive documentation to the ENGINEER for review.

E. Removal of Forms

1. Forms shall be removed as soon as the concrete has hardened sufficiently to resist damage from removal operations after review by the ENGINEER.

2. Top forms on sloping surfaces of concrete shall be removed as soon as the concrete has attained sufficient stiffness to prevent sagging. Any needed repairs or treatment required on such sloping surfaces shall be performed at once and be followed by specified curves.

3. Wood forms for wall openings shall be loosened as soon as this can be accomplished without damage to the concrete.

4. 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.

5. Forms and shoring in the formwork used to support the weight of concrete in beams, slabs, arches and other structural members shall remain in place until the concrete has reached 28-day compressive strength.

6. When shores and other vertical supports are so arranged that the non-load-carrying form facing material may be removed without loosening or disturbing the shores and supports, the facing material may be removed at an earlier age as permitted by the ENGINEER.

F. Removal Strength

1. When removal of formwork is based on the concrete reaching a specified strength, the concrete shall be presumed to have reached this strength when the following conditions have been met:

   a. When the concrete has been cured in accordance with the provisions of Article 3.06 for the same length of time as the age at test of laboratory-cured cylinders which reached the specified strength for form removal. The length

of time the concrete has been cured in the structure shall be determined by the cumulative number of days or fractions thereof, not necessarily consecutive, during which the temperature of the air in contact with the concrete is above 50˚F and the concrete has been damp or thoroughly sealed from evaporation and loss of moisture.

2.9 REINFORCEMENT

A. General

1. Shop Drawings, showing all fabrication dimensions and locations for placing of the reinforcing steel and accessories shall be submitted for review in accordance with provisions in Article 1.04. Review shall be obtained before fabrication.

2. Details of concrete reinforcement and accessories not covered herein shall be in accordance with ACI 315.

B. Reinforcing Steel

1. All reinforcement shall be Grade 60 (fy = 60,000 psi) and shall conform to the appropriate Specification listed below, except as follows:

   a. Yield strength shall be determined by testing of full size bars.

   b. For bars, wire, or wire fabric with a specified yield strength fy exceeding 60,000 psi, fy shall be the stress corresponding to a strain of 0.35 percent.

2. Reinforcing bars shall conform to ASTM A615 Grade 60 and the supplementary requirement S1 shall apply.

3. All cutting, bending, fabrication, and erection of reinforcing steel shall conform to the "Manual for Concrete Structures". (ACI 315 latest edition).

4. All splicing of reinforcing steel shall conform to "Reinforcing Bar Splices" latest edition by the Concrete Reinforcing Steel Institute and the "Building Code Requirements for Reinforced Concrete" (ACI 318-99).

5. Mats: Bar and rod mats for concrete reinforcement shall be of the clipped type conforming to "Specification for Fabricated Steel Bar or Rod Mats for Concrete Reinforcement" (ASTM A 184).

6. The use of plain bars is not permitted.

7. Supports for reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar supports complying with CRSI specifications.

8. For slabs-on-grade, use supports with sand plates or horizontal runners where base material does not support chair legs.

9. For exposed-to-view concrete surfaces, where support legs are in contact with forms, use supports with legs which are plastic protected (CRSI, Class I) or stainless steel-protected (CRSI, Class 2).

10. Epoxy coated reinforcing steel must be coated according to ASTM D3963-99.

C. Welding

1. When required or permitted, all welding of reinforcing bars shall conform to AWS D14. Unless otherwise accepted, welding of cross bars (tack welding) for assembly of reinforcement is prohibited. Reinforcing to be welded must be certified as weldable.

2. Welding of wire to wire, and of wire or welded wire fabric to reinforcing bars or structural steels, shall conform to applicable provisions of AWS D14 and supplementary requirements specified by the Architect/ENGINEER.

D. Fabricating and Placing Tolerances

1. Bars shall be fabricated in accordance with the tolerances given in ACI 315.

2. Reinforcement shall be placed to the following tolerances:

	Tolerances, In.
Clear distance	
To formed soffits	- ¼
To other formed surfaces	¼
Minimum spacing between bars	- ¼
Clear distances from unformed surface to top reinforcement	
Members 8 in. deep or less	¼
Members more than 8 in. deep but less than 24 in. deep	- ¼, + ½
Members 24 in. deep or greater	- ¼, + 1
Uniform spacing of bars, but the required number of bars shall not be reduced	2
Uniform spacing of stirrups and ties, but the required number of stirrups and ties shall not be reduced	1
Longitudinal locations of bends and ends of reinforcement	
General	2
Discontinuous ends of members	½ - 1½
Length of bar laps	- 1½
Embedded length	
For bar sizes No. 3 through 11	- 1
For bar sizes No. 14 and 18	- 2

3. Bars may be moved as necessary to avoid interference with other reinforcing steel, or embedded items. If bars are moved more than one bar diameter, or enough to exceed the above tolerances, additional reinforcing as directed by the ENGINEER may be required.

E. Placing

1. Minimum concrete cover for reinforcement, except for extremely corrosive atmosphere, other severe exposures, or fire protection, shall be as follows unless shown otherwise on the Drawings:

	Minimum cover, in.
Concrete deposited against the ground	3
Formed surfaces exposed to weather or in contact with the ground	
For bar sizes No. 6 or larger	2

For bar sizes No. 5 and smaller, and W31 or D31 wire and smaller 1½

Formed surfaces not exposed to weather or not in contact with the ground
- Beams, girders, and columns 1½
- Slabs, walls, and joists
  - For bar sizes No. 11 or smaller ¾
  - For bar sizes No. 14 and 18 1½

2. 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. Reinforcement with rust, mill scale or a combination of both will be accepted as being satisfactory without cleaning or brushing provided the dimensions and weights, including heights of deformations, of a cleaned sample are not less than required by the applicable ASTM specification.

3. All reinforcement shall be supported and fastened together to prevent displacement by construction loads or the placing of concrete beyond the tolerances of paragraph 2.08.D. On ground, where necessary, supporting concrete blocks may be used. Over formwork, metal, plastic or other approved bar chairs and spacers shall be used. All accessories within ½ inch of the formed concrete surface shall be plastic coated.

4. Vertical bars in columns shall be offset at least one bar diameter at lapped splices. To insure proper placement, templates shall be furnished for all column dowels.

5. All splices not shown in the Contract Documents shall be subject to review by the ENGINEER.

   Splicing shall be a minimum of 48 bar diameters (typ uno)

6. Reinforcement shall not be bent after being embedded in hardened concrete.

7. Handling and Storage of Epoxy-Coated Reinforcement. All systems for handling coated bars must have padded contact areas. Pad bundling bands or use other banding to prevent damage to the coating. Lift bundles of coated bars with a strong back, spreader bar, multiple supports, or a platform bridge to prevent bar-to-bar abrasion. Do not drop or drag the bars or bundles. Store coated bars on padded wood or steel cribbing, and cover to prevent exposure to the sun's ultraviolet rays.

8. Cutting Epoxy-Coated Reinforcement. Either saw or shear bars when cutting is permitted. Repair cut or sheared ends of bars.

9. Repair of Epoxy Coating. Repair coating damage due to bending, sawing, shearing, or damage during shipping, unloading, storage, installation, and handling at the construction site. Patch all sawed or sheared ends and all defects in the coating visible to the unaided eye according to AASHTO M284. Use an MDOT approved patching/repair material. Clean areas to be patched by removing all surface contaminants and damaged coating. Roughen the area to be patched before applying the patching material. Where rust is present, remove the rust by blast cleaning or power tool cleaning immediately before applying the patching material. Promptly treat the bar according to the resin manufacturer's recommendations and before detrimental oxidation occurs. Overlap the patching material onto the original coating 2 inches or as recommended by the manufacturer. Provide a minimum 8 mils dry film thickness on the patched areas. Any bar with 5 percent or more total damaged area in any 12 inch length of bar is considered severely damaged and must be replaced. Coat mechanical splices after splice installation according to AASHTO M284 for patching damaged epoxy coatings.

2.10 JOINTS AND EMBEDDED ITEMS

A. Construction Joints

1. Joints not shown in the Contract Documents shall receive prior review by the ENGINEER and shall be so made and located at least to impair the strength of the structure. In general, they shall be located near the middle of the spans of slabs, beams, and girders unless a beam intersects a girder at this point, in which case the joint in the girder shall be offset a distance equal to twice the width of the beam. Joints in walls and columns shall be at the underside of floors, slabs, beams, or girders and at the tops of footings or floor slabs. Beams, girders, brackets, column capitals, haunches, and drop panels shall be placed at the same time as slabs. Joints shall be perpendicular to the main reinforcement.

2. All reinforcement shall be continued across joints. Keys and inclined dowels shall be provided as directed by the ENGINEER. Longitudinal keys at least 1-1/2 in. deep shall be provided in all joints in walls and between walls and slabs or footings.

3. The surface of the concrete at all joints shall be thoroughly cleaned and all laitance removed prior to placing adjoining concrete.

4. Bond shall be obtained by roughening the surface of concrete in an approved manner which will expose the aggregate uniformly and will not leave laitance, loosened particles of aggregate or damaged concrete at the surface.

5. Construction joints shall be located as shown on the Contract Documents. In general, slab and wall pours shall not exceed 1200 sq ft surface area in one concrete placement between construction joints, the longer edge shall not be greater than twice the shorter edge for any one concrete pour between construction joints, and pour sequences shall be scheduled and located so that shrinkage and creep effects are minimized.

B. Expansion Joints

1. Reinforcement or other embedded metal items bonded to the concrete (except dowels in floors bonded on only one side of joints) shall not be permitted to extend continuously through any expansion joint.

2. Premolded expansion and isolation joint filler shall be of the type required and located by the Contract Documents and shall conform to the following specifications.

   a. "Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)" (ASTM D 994), at intersections of walls and pavements unless otherwise shown.

   b. "Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)" (ASTM D 1751), at pavements where pavement to pavement is jointed.

   c. “Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction” (ASTM D1752 Type 1) at all expansion and isolation joints in structural concrete.

3. Expansion and Isolation Joint Sealant, one part polyurethane: Concrete gray color unless otherwise required by ENGINEER. Before applying, wipe surface clean with solvent supplied by manufacturer.

C. Waterstops

1. Bentonite Waterstops: Flexible specially formulated compound of bentonite-butyl that swells upon contact with water and shall be used where plastic concrete meets previously hardened concrete, or where indicated in Drawings.

2. Where indicated on Drawings, use for standard applications in vertical and horizontal reinforced concrete eight (8) inches thick or greater with two (2) rows of reinforcement. For vertical and horizontal reinforced concrete greater than (18) inches thick, or where indicated on Drawings, provide two rows of waterstop.

3. If Noted on Drawings, or for special situations, use: “Volclay Waterstop - RX 101TRH Trapezoid; Rapid Hydration”; American Colloid Company

4. Waterstop RX is not a self-adhering product. Adhesive is required to adhere Waterstop-RX to concrete or metal surfaces. Use: “Volclay Waterstop - WB Adhesive”; American Colloid Company

D. Other Embedded Items

1. All sleeves, inserts, anchors, and embedded items required for adjoining work or for its support shall be placed prior to concreting.

E. Placing Embedded Items

1. Expansion joint material, waterstops, and other embedded items shall be positioned accurately and supported against displacement. Voids in sleeves, inserts, and anchor slots shall be filled temporarily with readily removable material to prevent the entry of concrete into the voids.

2. Set and build into Work anchorage devices and other embedded items required for other work that are attached to, or supported by, cast-in-place concrete. Use setting Drawings, diagrams, instructions and directions provided by suppliers of attachment items.

3. Conduits and pipes of aluminum shall not be embedded in structural concrete unless they are effectively coated or covered to prevent aluminum-concrete reaction or electrolytic action between aluminum and steel.

4. Expanding Bentonite Waterstops:

a. Fastening Waterstop. Before installing waterstop, apply minimum 15-mil-thick coating of Waterstop-WB adhesive, for width and length of applied expanding bentonite waterstop material.

b. Verify that three-(3) inch minimum coverage of concrete placement will occur along waterstop’s entire length. Do not install waterstop in keyways.

c. Follow Manufacturer’s recommended installation procedures.

PART 3 - EXECUTION

3.1 PRODUCTION OF CONCRETE

A. Ready-Mixed Concrete

1. Except as otherwise provided in this Section, ready-mixed concrete shall be batched, mixed and transported in accordance with "Specification for Ready-Mixed Concrete" (ASTM C 94) and ACI 304. Plant equipment and facilities shall conform to the "Check List for Certification of Ready Mixed Concrete Production Facilities" of the National Ready Mixed Concrete Association.

2. Concrete produced by on-site volumetric batching and continuous mixing shall be batched and mixed in accordance with and shall conform to all requirements of ASTM C685.

B. Control of Admixtures

1. Air-entraining admixtures, and other chemical admixtures shall be measured by means of an approved mechanical dispensing device. The liquid shall be considered a part of the mixing water. Admixtures that cannot be added in solution may be weighed or may be measured by volume if so recommended by the manufacturer.

2. If two or more admixtures are used in the concrete, they shall be added separately to avoid possible interaction that might interfere with the efficiency of either admixture or adversely affect the concrete.

3. Addition of retarding admixtures shall be completed within 1 minute after addition of water to the cement has been completed, or prior to the beginning of the last three-quarters of the required mixing, whichever occurs first.

C. Tempering and Control of Mixing Water

1. Concrete shall be mixed only in quantities for immediate use. Concrete which has set shall not be retempered, but shall be discarded.

2. The addition of water at the construction site will not be permitted.

D. Weather Conditions

1. Cold Weather - Ambient Temperature 45^{o}F or below

a. In cold weather, the temperature of the concrete when delivered at the site of the work shall conform to the following temperature limitations:

Minimum Temperature °F	Minimum Concrete Temperature °F
30 to 45	60
15 to 30	65
below 15	no concreting permitted

b. If water or aggregate is heated above 100°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°F.

c. When the temperature of the surrounding air is expected to be below 40°F during placing or within 24 hours thereafter, special precautions for concrete, placing, and protection shall be followed as required by

"Recommended Practice for Cold Weather Concreting" ACI 306 and modifications herein, see Article 3.06.

d. The CONTRACTOR shall provide all labor, equipment, and materials to meet the above cold weather requirements.

2. Hot Weather Ambient Temperature 90°F or Above

a. The ingredients shall be cooled before mixing, or flake ice or well-crushed ice of a size that will melt completely during mixing may be substituted for all or part of the mixing water if, due to high temperature, low slump, flash set or cold joints are encountered.

b. Concreting under hot weather conditions shall conform to "Recommended Practice for Hot Weather Concreting" ACI 305 and modifications herein. See Article 3.06. The use of an approved set retarder will be permitted under hot weather conditions.

3.2 PLACING

A. Preparation Before Placing

1. Hardened concrete and foreign materials shall be removed from the inner surfaces of the conveying equipment.

2. Formwork shall have been completed; snow, ice and water shall have been removed; reinforcement shall have been secured in place; expansion joint material, anchors, and other embedded items shall have been positioned.

3. Semi-porous subgrades shall be sprinkled sufficiently to eliminate suction and porous subgrades shall be sealed in an approved manner. See paragraph 3.05.B.4.

4. Concrete shall not be placed on frozen ground.

B. Conveying

1. Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of ingredients and in a manner which will assure that the required quality of the concrete is maintained.

2. Conveying equipment shall be approved and shall be of a size and design such that detectable setting of concrete shall not occur before adjacent concrete is placed. Conveying equipment shall be cleaned at the end of each operation or workday. Conveying equipment and operations shall conform to the following additional requirements:

a. Truck mixers, agitators, and non-agitating units and their manner of operation shall conform to the applicable requirements of "Specification for Ready-Mixed Concrete" (ASTM C 94).

b. Belt conveyors shall be horizontal or at a slope which will not cause excessive segregation or loss of ingredients. Concrete shall be protected against undue drying or rise in temperature. An approved arrangement shall be used at the discharge end to prevent apparent segregation. Mortar shall not be allowed to adhere to the return length of the belt. Long runs shall be discharged into a hopper or through a baffle.

c. Chutes shall be metal or metal-lined and shall have a slope not exceeding 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20 feet long and chutes not meeting the slope requirements may not be used.

d. Pumping or pneumatic conveying equipment shall be of suitable kind with adequate pumping capacity and shall conform to ACI committee report 304. Pneumatic placement shall be controlled so that segregation is not apparent in the discharged concrete. The loss of slump in pumping or pneumatic conveying equipment shall not exceed 1-1/2 inches. Concrete shall not be conveyed through pipe made of aluminum or aluminum alloy.

C. Depositing

1. General: Concrete shall be deposited 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. If a section cannot be placed continuously, construction joints shall be located as shown in the Contract Documents or as approved. Placing shall be carried on at such a rate that the concrete which is being integrated with fresh concrete is still plastic. Concrete which has partially hardened or has been contaminated by foreign materials shall not be deposited. Temporary spreaders in forms shall be removed when the concrete placing has reached an elevation rendering their service unnecessary. They may remain embedded in the concrete only if made of metal or concrete and if prior approval has been obtained. Communication between the batching plant and the point of delivery shall be such that concrete placement can proceed without interruption and without trucks waiting more than 15 minutes to make delivery.

2. Placing: Placing of concrete in supported elements shall not be started until the concrete previously placed in columns and walls is no longer plastic and has been in place at least two hours. Wall and column placement and consolidation shall be in approximately horizontal layers not exceeding 2 feet in height. Concrete shall not be allowed to drop freely more than 4 ft or through a reinforcing steel cage. Sections of walls between joints shall be placed continuously to produce a monolithic unit. At least 48 hrs shall elapse between casting of adjoining wall units.

3. Segregation: Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to rehandling or flowing. Concrete shall not be subjected to any procedure which will cause segregation. Horizontal flow shall not exceed five feet. Where concrete placing operations involve dropping concrete freely more than 4 feet vertically, spouts or pipes shall be used. Such pipes or spouts shall be of suitable diameter for the large aggregate being used, shall be kept within 3 feet of the concrete, and shall have suitable hoppers on their upper ends. Temporary openings or portholes in wall or column forms may be used to limit concrete free-fall to less than 4 ft. The ports should be spaced no more than 6 to 8 ft apart to limit horizontal concrete flow.

4. Placement Time: Concrete shall be placed no more than 90 minutes after the cement is first introduced into the drum. The batch will be rejected and removed from the site if this limit is exceeded.

5. Consolidation: All concrete shall be consolidated by vibration, spading, rodding or forking so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corners of forms, eliminating all air or stone pockets which may cause honeycombing, pitting, or planes of weakness. Internal vibrators shall have a minimum frequency of 8000 vibrations per min., and sufficient amplitude to consolidate the concrete effectively. They shall be operated by competent workmen.

Use of vibrators to transport concrete within forms shall not be allowed. Vibrators shall be inserted and withdrawn at points approximately 18 inches apart. At each insertion, the duration shall be sufficient to consolidate the concrete but not sufficient to cause segregation. A spare vibrator shall be kept on the job site during all concrete placing operations. Where the concrete is to have an as-cast finish, a full surface of mortar shall be brought against the form by the vibration process, supplemented if necessary by spading to work the coarse aggregate back from the formed surface. Consolidation shall conform to "Recommended Practice for Consolidation of Concrete" (ACI 309).

D. Protection

1. Adhere to the requirements of:

b. ACI 305 Hot Weather Concreting

c. ACI 306 cold Weather Concreting

2. Unless adequate protection is provided concrete shall not be placed during rain, sleet, or snow.

3. Rainwater shall not be allowed to increase the mixing water nor to damage the surface finish.

4. Placing Temperature: When the temperature of the surrounding air is expected to be below 40°F during placing or within 24 hours thereafter, the temperature of the plastic concrete, as placed, shall be no lower than 55°F. The temperature of the concrete as placed shall not be so high as to cause difficulty from loss of slump, flash set, or cold joints and shall not exceed 90°F.

E. Bonding

1. When specified, the surface of joints shall be prepared in accordance with one of the methods specified in paragraph 2.10.

2. The hardened concrete of wall construction joints and of construction joints between floor slabs shall be dampened (but not saturated) immediately prior to placing of fresh concrete.

3. The hardened concrete of joints in exposed work; joints in the middle of beams, girders, and joists; and horizontal joints in work designed to contain liquids shall be dampened (but not saturated) and then thoroughly covered with a coat of cement grout of similar proportions to the mortar in the concrete. The grout shall be as thick as possible on vertical surfaces and at least one inch (1") thick on horizontal surfaces. The fresh concrete shall be placed before the grout has attained its initial set.

3.3 REPAIR OF SURFACE DEFECTS

A. General

1. Surface defects, including tie holes, shall be repaired immediately after form removal.

B. Repair of Defective Areas

1. All honeycombed and other defective concrete shall be chipped down to sound concrete. The edges shall be perpendicular to the surface or slightly undercut. No feather edges will be permitted. The area to be patched and an area at least 6 inches wide surrounding it shall be dampened to prevent absorption of water from the patching mortar. A bonding grout shall be prepared using a mix of approximately 1 part cement to 1 part fine sand passing a No. 30 mesh sieve, mixed to the consistency of thick cream, and then well brushed into the surface.

2. The patching mixture shall be made of the same materials and of approximately the same proportions as used for the concrete, except that the coarse aggregate shall be omitted and the mortar shall consist of not more than 1 part cement to 2-1/2 parts sand by damp loose volume. The quantity of mixing water shall be no more than necessary for handling and placing. The patching mortar shall be mixed in advance and allowed to stand with frequent manipulation with a trowel, without addition of water, until it has reached the stiffest consistency that will permit placing. Use of latex bonding agent is required.

3. After surface water has evaporated from the area to be patched, the bond coat shall be well brushed into the surface. When the bond coat begins to lose the water sheen, the premixed patching mortar shall be applied. The mortar shall be thoroughly consolidated into place and struck off so as to leave the patch slightly higher than the surrounding surface. To permit initial shrinkage, it shall be left undisturbed for at least 1 hour before being finally finished. The patched area shall be kept damp for 7 days. Metal tools shall not be used in finishing a patch in a formed wall which will be exposed.

C. Tie Holes

1. After being cleaned and thoroughly dampened, the tie holes shall be filled solid with a non-metallic non-shrink patching mortar. The layout of tie holes and exterior finish of the tie holes on surfaces permanently exposed to view on the outside shall be submitted to the ENGINEER for review.

D. Proprietary compounds for adhesion or as patching ingredients may be used in lieu of or in addition to the foregoing patching procedures providing that prior review is done by the ENGINEER. The ENGINEER may require such compounds in certain patching locations.

3.4 FINISHING OF FORMED SURFACES

A. Finish on all surfaces shall be as cast finish as follows:

1. Smooth Form Finish: The form facing material shall produce a smooth, hard, uniform texture on the concrete. It may be plywood, tempered concrete-form-grade hardboard, metal, plastic, paper, or other approved material capable of producing the desired finish. The arrangement of the facing material shall be orderly and symmetrical, with the number of seams kept to the practical minimum. It shall be supported by studs or other backing capable of preventing excessive deflection. 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. Tie holes and defects shall be patched. All fins, projections, and seams shall be completely removed.

B. Related Unformed Surfaces

1. Tops of walls or buttresses, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces shall be struck smooth after concrete is placed and shall be floated to a texture reasonably consistent with that of the formed

surfaces. Final treatment on formed surfaces shall continue uniformly across the unformed surfaces.

3.5 SLABS

A. General

1. Concrete work for slab construction shall conform to "Recommended Practice for Concrete Floor and Slab Construction (ACI-302).

B. Preparation of Subgrade for Slabs on Ground

1. The subgrade shall be well drained and of adequate and uniform load bearing nature. The in-place density of the subgrade soils shall be at least the minimum required in the Specifications.

2. The subgrade shall be free of frost before concrete placing begins. If the temperature inside a structure where concrete is to be placed is below freezing it shall be raised and maintained above 50°F long enough to remove all frost from the subgrade.

3. The subgrade shall be moist at the time of concreting. If necessary, it shall be dampened with water in advance of concreting, but there shall be no free water standing on the subgrade nor any muddy or soft spots when the concrete is placed.

4. Floor slabs on granular fill shall be placed over a 6 mil polyethylene vapor barrier. Lap all joints of vapor barrier 12 inches minimum.

5. Soil Testing

a. The CONTRACTOR shall obtain and pay for, the services of a soils testing firm (acceptable to the ENGINEER) for the following:

1) Certify that materials proposed by CONTRACTOR meet specifications Certification test reports will be submitted by the CONTRACTOR.

2) Conduct compaction testing of engineered fill below footings and slabs and backfilling for utility trenches. The testing frequency shall be one test per lift per 400 square feet of fill.

3) Copies of test reports shall be furnished to the OWNER and distributed to parties designated by the OWNER, including the ENGINEER.

4) Any area falling compaction test shall be compacted and re-tested at the CONTRACTOR's expense.

C. Edge Forms and Screeds

1. Edge forms and intermediate screed strips shall be set accurately to produce the designated elevations and contours of the finished surface and shall be sufficiently strong to support vibration. The concrete surface shall be aligned to the contours of screed strips by the use of strike-off templates.

2. When formwork is cambered, screeds shall be set to a like camber to maintain the proper concrete thicknesses.

3. Screeds shall be removed before initial concrete set and depressions immediately filled to form a smooth monolithic surface.

D. Placement

1. Mixing and placing shall be carefully coordinated with finishing. Concrete shall not be placed on the subgrade or forms more rapidly than it can be spread, straightedged, and darbied or bullfloated. These operations must be performed before bleeding water has an opportunity to collect on the surface.

2. To obtain good surfaces and avoid cold joints, the size of finishing crews shall be planned with due regard for the effects of concrete temperature and atmospheric conditions on the rate of hardening of the concrete. If construction joints become necessary, they shall be constructed as required in subparagraph 2.10.A of this Section.

E. Jointing

1. Joints in slabs on grade shall be located and detailed as indicated in the Contract Documents. If saw-cut joints are required or permitted, cutting shall be timed properly with the set of the concrete: cutting shall be started as soon as the concrete has hardened sufficiently to prevent aggregates being dislodged by the saw, and shall be completed before shrinkage stresses become sufficient to produce cracking.

F. Consolidation

1. Concrete in slabs shall be thoroughly consolidated. Internal vibration shall be used in beams and girders of framed slabs and along the bulkheads of slabs on grade. Consolidation of slabs shall be obtained with internal vibrators.

G. Finishes (See paragraph 3.05.H for Finishing Tolerance)

1. All concrete flatwork such as slabs on grade inside and outside of the building and supported slabs shall at first receive a "floated finish". After the concrete has been placed, consolidated, struck off, and leveled, the concrete shall not be worked further until ready for floating. Floating shall begin when the water sheen has disappeared and when the surface has stiffened sufficiently to permit the operation. During or after the first floating, planeness of surface shall be checked by the CONTRACTOR with a 10-ft. straightedge applied at not less than two different angles. All high spots shall be cut down and all low spots filled during this procedure to produce a surface within Class B tolerance throughout. The slab shall then be refloated immediately to a uniform sandy texture. Additional finishing shall be required. See G.2 or G.3.

2. Outside sidewalk, ramp slabs, loading dock and walkway top slabs shall receive a broom or belt finish. Immediately after concrete has received the "float finish" as specified in 3.05.G.1 above, it shall be given a coarse transverse scored texture by drawing a broom or burlap belt across the surface.

3. A "troweled finish" shall be used for all concrete flatwork which does not receive a broom finish or which does not receive a grout finish. The surface shall first be float-finished as specified in item 3.05.G.1 above. It shall next be power troweled, and finally hand troweled. The first trowelling after power floating shall produce a smooth surface which is relatively free of defects but which may still show some trowel marks. Additional trowellings shall be done by hand after the surface has hardened sufficiently. The final trowelling shall be done when a ringing sound is produced as the trowel is moved over the surface. The surface shall be thoroughly consolidated

by the hand trowelling operations. The finished surface shall be essentially free of trowel marks, uniform in texture and appearance and shall be plane to a Class A tolerance, except tolerance for concrete on metal deck shall be Class B. On surfaces intended to support floor coverings, any defects of sufficient magnitude to show through the floor covering shall be removed by grinding.

H. Finishing Tolerances

1. Finishes with Class A tolerances shall be true planes within 1/8 inch in 10 ft as determined by a 10-foot straightedge placed anywhere on the slab in any direction.

2. Finishes with Class B tolerances shall be true planes within 1/4-inch on 10 ft as determined by a 10-foot straightedge placed anywhere on the slab in any direction.

3. Finishes with Class C tolerances shall be true planes within 1/4 inch in 2 ft as determined by a 2-ft straightedge placed anywhere on the slab in any direction.

3.6 CURING AND PROTECTION

A. General

1. Beginning immediately after placement, concrete shall be protected from premature drying, excessively hot or cold temperatures, and mechanical injury, and shall be maintained with minimal moisture loss at a relatively constant temperature for the period necessary for hydration of the cement and hardening of the concrete. The materials and methods of curing shall be in accordance with ACI 308 and subject to review by the ENGINEER.

B. Preservation of Moisture

1. For concrete surfaces not in contact with forms, ponding or continuous sprinkling shall be applied immediately after completion of placement and finishing and be continued for a minimum of three (3) days. After the initial 3-day period, one of the following procedures shall be applied:

a. Ponding or continuous sprinkling;

b. Application of absorptive mats or fabric kept continuously wet;

c. Continuous application of mist spray;

d. Application of other moisture-retaining covering as approved.

e. The use of curing compounds shall not be permitted.

2. Moisture loss from surfaces placed against wooden forms or metal forms exposed to heating by the sun shall be minimized by keeping the forms wet until they can be safely removed. After form removal, the concrete shall be cured until the end of the time prescribed in 3.06.B.3 below by one of the methods of 3.06.B.1 above.

3. Curing in accordance with 3.06.B.1 and 2 above shall be continued for at least 14 days in the case of all concrete.

C. Temperature, Wind, and Humidity

1. Adhere to the requirements of:

a. ACI 305 Hot Weather Concreting

b. ACI 306 Cold Weather Concreting

2. Cold Weather: When the mean daily outdoor temperature is less than 40˚F, the temperature of the concrete shall be maintained between 50˚F and 70˚F for 14 days. Arrangements for heating, covering, insulating, and 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 heat. Combustion heaters shall not be used during the first 24 hours unless precautions are taken to prevent exposure of the concrete to exhaust gases.

3. Hot Weather: When necessary, provision for windbreaks, shading, fog spraying, sprinkling, ponding, or wet covering with a light colored material shall be made in advance of placement, and such protective measures shall be taken as quickly as concrete hardening and finishing operations will allow.

4. Rate of Temperature Change: Changes in temperature of the air immediately adjacent to the concrete during and immediately following the curing period shall be kept as uniform as possible and shall not exceed 5°F in any one hour or 50°F in any 24-hour period.

D. Protection from Mechanical Injury

1. During the curing period, the concrete shall be protected from damaging mechanical disturbances, such as load stresses, heavy shock, and excessive vibration. All finished concrete surfaces shall be protected from damage by construction equipment, materials, or methods, by application of curing procedures, and by rain or running water. Structures shall not be loaded in such a way as to overstress the concrete.

3.7 TESTING

A. General

1. Concrete materials and operations will be tested and inspected as the work progresses. Failure to detect any defective work or material shall not in any way prevent later rejection when such defect is discovered nor shall it obligate the ENGINEER for final review.

B. Testing Agencies

1. All testing agencies shall meet the requirements of "Inspection and Testing Agencies for Concrete and Steel as Used in Construction," (ASTM E329).

C. Testing Services

The following testing services shall be performed by the designated agency:

1. Review and test the CONTRACTOR's proposed materials for compliance with the Specifications.

2. Review and test the CONTRACTOR's proposed mix design as required by the ENGINEER.

3. Secure production samples of materials at plants or stock-piles during the course of the work and test for compliance with the Specifications.

4. Conduct strength tests of the concrete during construction in accordance with the following procedures:

   a. Secure composite samples in accordance with "Method of Sampling Fresh Concrete" (ASTM C 172). Each sample shall be obtained from a different batch of concrete on a random basis, avoiding any selection of the test batch other than by a number selected at random before commencement of concrete placement.

   b. Mold and cure four specimens from each sample in accordance with "Method of Making and Curing Concrete Test Specimens in the Field" (ASTM C 31). Any deviations from the requirements of this standard shall be recorded in the test report.

   c. Test specimens in accordance with "Method of Test for Compressive Strength of Cylindrical Concrete Specimens" (ASTM C 39). Two specimens shall be tested at 28 days for acceptance and one shall be tested at 7 days for information. The fourth cylinder shall be held as a spare specimen to be tested as directed by the ENGINEER. The acceptance "strength test" result shall be the average of the strengths of the two specimens tested at 28 days. If one specimen in a test manifests evidence of improper sampling, molding or testing, it shall be discarded and the strength of the remaining cylinder shall be considered the "strength test" result. Should both specimens in a test show any of the above defects, the entire test shall be discarded. When high early strength concrete is used, the specimens shall be tested with two specimens at 14 days and one specimen at 3 days. The acceptance will be based on the 14-day test.

   d. Make at least one "strength test" (mold four cylinders) for each 50 cubic yards, or fraction thereof, of each mix design of concrete placed in any 1 day.

5. Determine slump of the concrete sample for each strength test and whenever consistency of concrete appears to vary, using "Method of Test for Slump of Portland Cement Concrete: (ASTM C 143).

6. Determine air content of normal weight concrete sample for each strength test in accordance with the "Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method" (ASTM C 231), "Method of Test for Air Content of Freshly Mixed Concrete by the Volumetric Method" (ASTM C 173) or "Method of Test for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete" (ASTM C 138).

7. Determine temperature of concrete sample for each strength test.

D. Additional Services When Required

The following services shall be performed by the designated agency when required by the ENGINEER:

1. Inspect concrete batching, mixing and delivery operations to the extent deemed necessary by the ENGINEER.

2. Sample concrete at point of placement and perform required tests.

3. Other testing or inspection services as required by the ENGINEER.

E. Other Services as Needed

The following services shall be performed by the designated agency when necessary and costs of said services shall be borne by the CONTRACTOR:

1. Additional testing and inspection required because of changes in materials or proportions requested by the CONTRACTOR.

2. Additional testing of materials or concrete occasioned by their failure by test or inspection to meet specification requirements. (See Article 3.08)

3. Testing to determine strength for early form removal. (See paragraph 2.08.E and F.)

F. Duties and Authorities of Designated Testing Agency

1. Representatives of the agency shall inspect, sample and test the materials and the production of concrete as specified herein. When it appears that any material furnished or work performed by the CONTRACTOR fails to fulfill specification requirements, the testing agency shall report such deficiency to the ENGINEER and the CONTRACTOR promptly.

2. The agency shall report all test and inspection results to the ENGINEER and CONTRACTOR immediately after they are performed. All test reports shall include the exact location in the work at which the batch represented by a test was deposited. Reports of strength tests shall include detailed information on storage and curing of specimens prior to testing.

3. The testing agency or its representatives are not authorized to modify any requirement of the Contract Documents, nor to approve, accept, disapprove or reject any portion of the work.

G. Responsibilities and Duties of CONTRACTOR

1. The use of testing services shall in no way relieve the CONTRACTOR of the responsibility to furnish materials and construction in full compliance with the Contract Documents.

2. The CONTRACTOR shall submit to the ENGINEER the concrete materials and the concrete mix designs proposed for use with a written request for review. This submittal shall include the results of all testing performed to qualify the materials and to establish the mix designs. No concrete shall be placed in the work until the CONTRACTOR has received such approval in writing.

3. To facilitate testing and inspection, the CONTRACTOR shall provide and maintain for the use of the testing agency and ENGINEER adequate facilities for safe storage and proper curing of concrete test specimens on the project site for the first 24 hours as required by "Method of Making and Curing Concrete Test Specimens in the Field" (ASTM C 31). The CONTRACTOR shall provide labor, tools, and equipment to assist in the sampling and testing of concrete on the job. The CONTRACTOR shall advise the designated testing agency sufficiently in advance of operations to allow for completion of quality tests and assignment of personnel.

3.8 EVALUATION AND ACCEPTANCE OF CONCRETE

A. Evaluation of Test Results

1. Test results for standard molded and standard cured test cylinders shall be evaluated separately for each specified concrete mix design. Such evaluation shall be valid only if tests have been conducted in accordance with procedures specified in Article 3.07.

B. Acceptance of Concrete

1. The following conditions must be met:

a. The strength level of the concrete will be considered satisfactory and acceptable so long as the average of all sets of three consecutive "strength test" results equals or exceeds the specified 28 day strength f'c and no individual "strength test" result falls below the specified 28 day strength f'c by more than 500 psi. The strength level of the concrete shall be measured at 14 days for high-early strength concrete. High-early strength concrete shall achieve the specified 28-day f'c at the age of 14 days.

b. The requirements described by paragraphs 3.09 Acceptance of Structure, A, B, C and D.

C. Testing of Concrete in Place

1. This Work shall be at the CONTRACTOR’s expense.

2. Testing by impact hammer, sonoscope, or other non-destructive device may be permitted or required by the ENGINEER to determine relative strengths at various locations in the structure as an aid in evaluating concrete strength in place and for selecting areas to be cored, if the strength level of the concrete is not satisfactory. Such tests shall not be used as a basis for acceptance or rejection.

3. Core Tests: Required when paragraph 3.08.B specifications are not met.

a. Cores at least 2 inches in diameter shall be obtained and tested in accordance with "Methods of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete" (ASTM C 42). Cores shall be taken as soon as practicable after determining that the concrete strength level is unsatisfactory in accordance with paragraph 3.08.B. If the concrete in the structure will be dry under service conditions, other cores shall be air dried (temperature 60° to 80°F, relative humidity less than 60 percent) for 7 days before test and shall be tested dry. If the concrete in the structure will be more than superficially wet under service conditions, the cores shall be tested after moisture conditioning in accordance with ASTM C 42.

b. At least three representative cores shall be taken from each member or area of concrete in place that is considered potentially deficient. The location and number of cores shall be determined by the ENGINEER so as least to impair the strength of the structure and best represent the condition of the potentially deficient concrete. If, before testing, one or more of the cores shows evidence of having been damaged subsequent to or during removal from the structure, they shall be replaced.

c. Concrete in the area represented by the core test will be considered adequate and acceptable if the average strength of the cores is equal to at least 85 percent of, and if no single core is less than 75 percent of, the specified 28 day strength f'c. If the above strengths are not met, the CONTRACTOR shall remove the deficient concrete.

d. Core holes shall be filled by the CONTRACTOR with low slump concrete or mortar. See Article 3.03, Repair of Surface Defects.

3.9 ACCEPTANCE OF STRUCTURE

A. General

1. Completed concrete work which meets all applicable specification requirements will be accepted without qualification.

2. Completed concrete work which fails to meet one or more of the specified requirements but which has been repaired to bring it into compliance will be accepted without qualifications.

3. If any concrete does not meet the specified strength levels in paragraph 03.08.B, Acceptance of Concrete, the ENGINEER will require additional material and other tests to determine the probable cause of the low strength levels. This may result in remedial actions or modifications being required in the methods or materials being employed. Such actions or modifications shall be at the CONTRACTOR's expense.

4. Completed concrete work which fails to meet the requirements of paragraph 03.08.C.2.c. will be rejected and the CONTRACTOR will be required to remove and replace the defective concrete. In this event, modifications will be required to assure that remaining work complies with the requirements.

B. Dimensional Tolerances

1. Formed surfaces resulting in concrete outlines smaller than permitted by the tolerances of paragraph 2.08.C shall be considered potentially deficient in strength and subject to the provisions of paragraph 3.09.D.

2. Formed surfaces resulting in concrete outlines larger than permitted by the tolerances of paragraph 2.08.C may be rejected and the excess material shall be subject to removal. If removal of the excess material is required, it shall be accomplished in such a manner as to maintain the strength of the section and to meet all other applicable requirements of function and appearance.

3. Concrete members cast in the wrong location will be rejected.

4. Inaccurately formed concrete surfaces exceeding the limits of paragraph 02.08.C may be rejected and shall be repaired or removed and replaced as required by the ENGINEER.

5. Finished slabs exceeding the tolerances of paragraphs 03.05.H may be required to be repaired provided that strength or appearance is not adversely affected. High spots may be removed with a terrazzo grinder, low spots filled with a patching compound, or other remedial measures performed as reviewed by the ENGINEER.

C. Appearance

1. All concrete with defects which adversely affect the appearance or function of the specified finish may be repaired only by approved methods.

D. Strength of Structure

1. The strength of the structure in place will be considered deficient if it fails to comply with any requirements, which control the strength of the structure, including but not necessarily limited to the following conditions:

a. Low concrete strength as designated in Article 03.08.

b. Reinforcing steel size, quantity, strength, position, or arrangement at variance with the requirements of Article 02.09, Reinforcement, or the Contract Documents.

c. Concrete which differs from the required dimensions or location in such a manner as to reduce the strength.

d. Curing less than that specified.

e. Inadequate protection of concrete from extremes of temperature during early stages of hardening and strength development.

f. Mechanical injury as defined in paragraph 03.06.D, construction fires, accidents or premature removal of formwork likely to result in deficient strength.

2. Additional testing will be required when the strength of the structure is considered potentially deficient. Cost of this testing will be borne by the CONTRACTOR.

3. Core tests in accordance with paragraph 03.08.C.2 will be required when ENGINEER determines that the strength of the concrete in place is considered potentially deficient. Cost of coring and testing will be borne by the CONTRACTOR.

4. Concrete work judged inadequate by failure to meet the requirements of paragraphs 03.08B and 03.08.C.2 shall be removed and replaced at the CONTRACTOR's expense.

5. The CONTRACTOR shall pay all costs incurred in providing the additional testing and/or analysis required by these Specifications, or the Contract Documents.

6. The OWNER will pay all costs of additional testing and/or analyses which are made at its request and which are not required by these Specifications, or the Contract Documents.

3.10 CLEANING UP

A. At the completion of the concrete work to the satisfaction of and review by the ENGINEER, all extraneous concrete debris, materials and equipment shall be removed from the job site and the concrete shall be left clean and in first class condition.

MIX DESIGN SCHEDULE

Concrete Class	A
Locations	Wall
28-day Compressive Strength (psi)	4,000
Cement Content (per CYD of concrete)	594 (6 sack equivalent)
Coarse Aggregate	6AA
Water/Cement Ratio by Weight (maximum)	0.43
Air Content (% by volume)	6% ± 1%
Slump at point of placement (inches) *	4” – 6” (will vary based on location)
Fiber Reinforcement	No
Fly Ash (% of cement content; maximum)	15 – 20%
Silica Fume	No

END OF SECTION

SECTION 05010

METAL MATERIALS

PART 1 – GENERAL

1.1 THE REQUIREMENT

A. Metal materials not otherwise specified shall conform to the requirements of this Section.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Materials for fasteners are included in Section 05050, Metal Fastening.

B. Requirements for specific products made from the materials specified herein are included in other sections of the Specifications. See the section for the specific item in question.

1.3 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A.	ASTM A36	Standard Specification for Structural Steel
B.	ASTM A47	Standard Specification for Malleable Iron Castings
C.	ASTM A48	Standard Specification for Gray Iron Castings
D.	ASTM A53	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
E.	ASTM A167	Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
F.	ASTM A276	Standard Specification for Stainless and Heat-Resisting Steel Bars and Shapes
G.	ASTM A307	Standard Specification for Carbon Steel Externally Threaded Standard Fasteners
H.	ASTM A446	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) quality
I.	ASTM A500	Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
J.	ASTM A501	Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
K.	ASTM A529	Standard Specification for Structural Steel with 42 000 psi (290 Mpa) Minimum Yield Point (1/2 in. (12.7 mm) Maximum Thickness)
L.	ASTM A536	Standard Specification for Ductile Iron Castings
M.	ASTM A570	Standard Specification for Hot-Rolled Carbon Steel Sheet and Strip, Structural Quality

N. ASTM A992 Standard Specification for Structural Steel Shapes

O. ASTM A666 Standard Specification for Austenitic Stainless Steel, Sheet, Strip, Plate, and Flat Bar for Structural Applications

P. ASTM B26 Standard Specification for Aluminum-Alloy Sand Castings

Q. ASTM B85 Standard Specification for Aluminum-Alloy Die Castings

R. ASTM B108 Standard Specification for Aluminum-Alloy Permanent Mold Castings

S. ASTM B138 Standard Specification for Manganese Bronze Rod, Bar, and Shapes

T. ASTM B209 Standard Specification for Aluminum-Alloy Sheet and Plate

U. ASTM B221 Standard Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes

V. ASTM B308 Standard Specification for Aluminum-Alloy Standard Structural Shapes, Rolled or Extruded

W. ASTM B574 Standard Specification for Nickel-Molybdenum-Chromium Alloy Rod

X. ASTM F468 Standard Specification for Nonferrous Bolts, Hex Cap Screws, and Studs for General Use

Y. ASTM F593 Standard Specification for Stainless Steel Fasteners

1.4 SUBMITTALS

A. Material certifications shall be submitted along with any Shop Drawings for metal products and fabrications required by other sections of the Specifications.

1.5 QUALITY ASSURANCE

A. OWNER may engage the services of a testing agency to test any metal materials for conformance with the material requirements herein. If the material is found to be in conformance with Specifications the cost of testing will be borne by the OWNER. If the material does not conform to the Specifications, the cost of testing shall be paid by the CONTRACTOR and all materials not in conformance as determined by the Engineer shall be replaced by the CONTRACTOR at no additional cost to the OWNER. In lieu of replacing materials the CONTRACTOR may request further testing to determine conformance, but any such testing shall be paid for by the CONTRACTOR regardless of outcome of such testing.

PART 2 – PRODUCTS

2.1 CARBON AND LOW ALLOY STEEL

A. Material types and ASTM designations shall be as listed below:

1.	Structural Fabrications	A992
2.	Sheet Steel	A 570 Grade C
3.	Steel Angles and Plates	A36
4.	Bars and Rods	A 36 or A307 Grade A
5.	Pipe - Structural Use	A53 Type E or S, Grade B
6.	Tubes	A500 Grade B or A501

2.2 STAINLESS STEEL

A. All stainless steel fabrications exposed to underwater service shall be Type 316. All other stainless steel fabrications shall be Type 304, unless noted otherwise.

B. Material types and ASTM designations are listed below:

1.	Plates and Sheets	ASTM A167 or A666 Grade A
2.	Structural Shapes	ASTM A276
3.	Fasteners (Bolts, etc.)	ASTM F593

2.3 CAST IRON

A. Material types and ASTM designations are listed below:

1.	Gray	ASTM A48 Class 30B
2.	Malleable	ASTM A47
3.	Ductile	ASTM A536 Grade 60-40-18

2.4 BRONZE

A. Material types and ASTM designations are listed below:

1.	Rods, Bars and Sheets	ASTM B138 - Alloy B Soft

PART 3 – EXECUTION

(NOT USED)

END OF SECTION

SECTION 05050

METAL FASTENING

PART 1 – GENERAL

1.1 THE REQUIREMENT

A. Furnish all materials, labor, and equipment required to provide all metal welds and fasteners not otherwise specified, in accordance with the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 05010 - Metal Materials

B. Section 05120 - Structural Steel

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of the other requirements of the specifications, all work herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1.	Michigan Building Code	
2.	AISC	Specification for Structural Joints Using ASTM A325 or A490 Bolts.
3.	AISC	Code of Standard Practice
4.	AWS D1.1	Structural Welding Code - Steel
5.	AWS D1.2	Structural Welding Code - Aluminum
6.	AWS D1.6	Structural Welding Code – Stainless Steel
7.	Aluminum Association	Specifications for Aluminum Structures
8.	ASTM A572/A572M-94C	Standard Specification for High Strength Low-Alloy Columbium-Vanadium Structural Steel Grade 50
9.	ASTM A307	Standard Specification for Carbon Steel Externally Threaded Standard Fasteners
10.	ASTM A325	Standard Specification for High-Strength Bolts for Structural Steel Joints
11.	ASTM A489	Standard Specification for Eyebolts
12.	ASTM A490	Standard Specification for Quenched and Tempered Alloy Steel Bolts for Structural Steel Joints

13.	ASTM A563	Standard Specifications for Carbon and Alloy Steel Nuts
14.	ASTM F593	Standard Specification for Stainless Steel Bolts; Hex Cap Screws, and Studs
15.	ASTM F594	Standard Specification for Stainless Steel Nuts
16.	ASTM D1785	Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe
17.	ASTM F467	Standard Specification for Nonferrous Nuts for General Use

1.4 SUBMITTALS

A. Submit the following in accordance with Section 01300, Submittals.

1. Shop Drawings providing the fastener's manufacturer and type and certification of the fastener's material and capacity.

2. Copy of valid certification for each person who is to perform field welding.

3. Certified weld inspection reports, when required.

4. Welding procedures.

1.5 QUALITY ASSURANCE

A. Fasteners not manufactured in the United States shall be tested and certification provided with respect to specified quality and strength standards. Certifications of origin shall be submitted for all U.S. fasteners supplied on the project.

B. All steel welding shall be performed by welders certified in accordance with AWS D1.1. All aluminum welding shall be performed by welders certified in accordance with AWS D1.2. All stainless steel welding shall be performed by welders certified in accordance with AWS D1.6. Certifications of field welders shall be submitted prior to performing any field welds.

C. Welds and high strength bolts used in connections of structural steel will be visually inspected in accordance with Article 3.04.

D. The OWNER may engage an independent testing agency to perform testing of welded connections and to prepare test reports in accordance with AWS. Inadequate welds shall be corrected or redone and retested to the satisfaction of the ENGINEER, OWNER, and/or an acceptable independent testing laboratory, at no additional cost to the OWNER.

E. Provide a welding procedure for each type and thickness of weld. For welds that are not prequalified, include a Performance Qualification Report. The welding procedure shall be given to each welder performing the weld. The welding procedure shall follow the format in Annex E of AWS D1.1 with relevant information presented.

PART 2 – PRODUCTS

2.1 ANCHOR BOLTS

A. Anchor bolts shall conform to ASTM A36 or ASTM A307 Grade A except where stainless steel or other approved anchor bolts are shown on the Drawings. Anchor bolts shall have hexagonal heads and shall be supplied with hexagonal nuts meeting the requirements of ASTM A563 Grade A.

B. Where pipe sleeves around anchor bolts are shown on the Drawings, pipe sleeves shall be cut from Schedule 40 PVC plastic piping meeting the requirements of ASTM D1785.

2.2 HIGH STRENGTH BOLTS

A. High strength bolts and associated nuts and washers shall be in accordance with ASTM A325 or ASTM A490. Bolts, nuts and washers shall meet the requirements of AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts".

2.3 STAINLESS STEEL BOLTS

A. Stainless steel bolts shall conform to ASTM F-593.

B. Stainless steel bolts shall have hexagonal heads with a raised letter or symbol on the bolts indicating the manufacturer, and shall be supplied with hexagonal nuts meeting the requirements of ASTM F594. Nuts shall be of the same alloy as the bolts.

C. Stainless steel bolts shall be used as shown on the Drawings.

2.4 CONCRETE ANCHORS

A. All concrete anchors shall be adhesive anchors.

1. Adhesive anchors shall be two part injection type.

B. Adhesive anchors shall consist of stainless steel threaded rods or bolts anchored with an adhesive system into hardened concrete or grout-filled masonry. The adhesive system shall use a two-component adhesive mix and shall be injected with a static mixing nozzle following manufacturer's instructions. Thoroughly clean drill holes of all debris and drill dust with wire brush prior to installation of adhesive and threaded rod/bolt. Wipe rod free from oil that may be present from shipping or handling. The embedment depth of the rod/bolt shall provide a minimum allowable bond strength that is equal to the allowable tensile capacity of the rod/bolt (see Table 1) unless noted otherwise on the Drawings. The adhesive system shall be “HIT ICE” as manufactured by Hilti, Inc, or approved equal.

C. Concrete anchors used to anchor aluminum, FRP, or stainless steel shall be Type 304 stainless steel unless noted otherwise. All underwater concrete anchors shall be Type 316 stainless steel.

TABLE 1
ALLOWABLE TENSILE CAPACITY (KIPS)

Size	A36 Threaded Rod/Bolt	SST Threaded Rod/Bolt
3/8"	2.1	1.9
1/2"	3.8	3.5
5/8"	5.9	5.6
3/4"	8.4	8.2
7/8"	11.5	11.4
1"	15.0	15.0

2.5 WELDS

A. Electrodes for welding structural steel and all ferrous steel shall comply with AWS Code, using E70 series electrodes for shielded metal arc welding (SMAW), or F7 series electrodes for submerged arc welding (SAW).

B. Electrodes for welding aluminum shall comply with the Aluminum Association Specifications and AWS D1.2.

C. Electrodes for welding stainless steel and other metals shall comply with AWS D1.6.

2.6 WELDED STUD CONNECTORS

A. Welded stud connectors shall conform to the requirements of AWS D1.1 Type C.

2.7 EYEBOLTS

A. Eyebolts shall conform to ASTM A489 unless noted otherwise.

2.8 ANTISEIZE LUBRICANT

A. Antiseize lubricant shall be Graphite 50 Anti-Seize by Loctite Corporation, 1000 Anti-Seize Paste by Dow Corning, 3M Lube and Anti-Seize by 3M, or equal as approved by ENGINEER and OWNER.

PART 3 – EXECUTION

3.1 MEASUREMENTS

A. The CONTRACTOR shall verify all dimensions and review the Drawings and shall report any discrepancies to the ENGINEER for clarification prior to starting fabrication.

3.2 BOLT INSTALLATION

A. Anchor Bolts and Concrete Anchors

1. Anchor bolts shall be installed in accordance with AISC "Code of Standard Practice" by setting in concrete while it is being placed and positioned by means of a rigidly held template.

2. The CONTRACTOR shall verify that all concrete anchors have been installed in accordance with the manufacturer's recommendations and that the capacity of the installed anchor meets or exceeds the specified safe holding capacity.

3. Concrete anchors shall not be used in place of anchor bolts without ENGINEER's approval.

4. All stainless steel threads shall be coated with antiseize lubricant.

B. High Strength Bolts

1. All bolted connections for structural steel shall use high strength bolts. High strength bolts shall be installed in accordance with AISC "Specification for Structural Joints, using A325 or A490 Bolts." All bolted joints shall be Type N, snug-tight, bearing connections in accordance with AISC Specifications unless noted otherwise on the Drawings.

C. Other Bolts

1. All dissimilar metal shall be connected with appropriate fasteners and shall be insulated with a dielectric or approved equal.

2. All stainless steel bolts shall be coated with antiseize lubricant.

3.3 WELDING

A. All welding shall comply with AWS Code for procedures, appearance, quality of welds, qualifications of welders and methods used in correcting welded work.

B. Welded stud connectors shall be installed in accordance with AWS D1.1.

3.4 INSPECTION

A. High strength bolting will be visually inspected in accordance with AISC "Specification for Structural Joints Using A325 or A490 Bolts." Rejected bolts shall be either replaced or retightened as required.

B. Field welds will be visually inspected in accordance with AWS Codes. Inadequate welds shall be corrected or redone as required in accordance with AWS Codes.

END OF SECTION

SECTION 05120

STRUCTURAL STEEL

PART 1 – GENERAL

1.1 THE REQUIREMENT

A. Furnish all equipment, labor, materials, and services required to provide all structural steel work in accordance with the Contract Documents. The term "structural steel" shall include items as defined in the AISC "Code of Standard Practice".

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 05010 - Metal Materials

B. Section 05050 - Metal Fastening

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of the Specifications, all work specified herein shall conform to the applicable requirements of the following documents.

1. Michigan Building Code
2. AISC - "Code of Standard Practice"
3. AISC - "Specification for Structural Steel Buildings"
4. AISC - "Specifications for Structural Joints Using ASTM A325 or A490 Bolts"
5. AWS - "Structural Welding Code"

1.4 SUBMITTALS

A. Submit the following in accordance with Section 01300, Submittals.

1. Certified Mill Test Reports
2. Affidavit of Compliance with grade specified
3. Shop Drawings which include the following:
    a. Layout Drawings indicating all structural shapes, sizes, and dimensions.
    b. Beam and column schedules.
    c. Detailed Drawings indicating jointing, anchoring and connection details.

1.5 QUALITY ASSURANCE

A. Shop inspection may be required by the OWNER at his own expense. The CONTRACTOR shall give ample notice to the ENGINEER and OWNER prior to the beginning of any fabrication work so that inspection may be provided. The CONTRACTOR shall furnish all facilities for the inspection of materials and workmanship in the shop and the inspectors shall

be allowed free access to the necessary parts of the work. Inspectors shall have the authority to reject any materials or work which do not meet the requirements of these Specifications. Inspection at the shop is intended as a means of facilitating the work and avoiding errors, but is expressly understood that it will in no way relieve the CONTRACTOR from his responsibility for furnishing proper materials or workmanship under this Specification.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Structural Steel

1. Structural steel for W shapes shall conform to ASTM A992 unless otherwise indicated.

2. Structural steel for S, M, and HP shapes and channels shall conform to ASTM A572 Grade 50 unless otherwise indicated.

3. Structural steel for angles and plates shall conform to ASTM A36 unless otherwise indicated.

4. Steel pipe shall be ASTM A53, Grade B.

5. HSS shall be ASTM A500, Grade B. All members shall be furnished full length without splices unless otherwise noted or accepted by the ENGINEER.

6. All unidentified steel will be rejected and shall be removed from the site and replaced by the CONTRACTOR, all at the expense of the CONTRACTOR.

7. Fasteners for structural steel shall be in accordance with Section 05050, Metal Fastening.

8. All structural steel shall be free from mill scale.

B. Welds

1. Electrodes for welding shall be in accordance with Section 05050, Metal Fastening.

PART 3 – EXECUTION

3.1 MEASUREMENT

A. The CONTRACTOR shall verify all dimensions and shall make any field measurements necessary and shall be fully responsible for accuracy and layout of work. The CONTRACTOR shall review the Drawings and any discrepancies shall be reported to the ENGINEER for clarification prior to starting fabrication.

3.2 FABRICATION

A. Fabrication shall be in accordance with the AISC "Specification for Structural Steel Buildings and AISC "Code of Standard Practice". Fabrication shall begin only after Shop Drawing approval.

B. Except where otherwise noted on the Drawings or in this Specification, all shop connections shall be welded.

C. All holes in structural steel members required for anchors, anchor bolts, bolt holes, sag rods or other members or for attachment of other work shall be provided by the fabricator and detailed on the Shop Drawings.

D. All materials shall be properly worked and match-marked for field assembly.

3.3 DELIVERY, STORAGE AND HANDLING

A. Structural members shall be loaded in such a manner that they may be transported and unloaded without being over-stressed, deformed or otherwise damaged.

B. Structural steel members and packaged materials shall be protected from corrosion and deterioration. Material shall be stored in a dry area and shall not be placed in direct contact with the ground. Materials shall not be placed on the structure in a manner that might cause distortion or damage to the members or the supporting structures. The CONTRACTOR shall repair or replace damaged materials or structures as directed.

3.4 ERECTION

A. The erection of all structural steel shall conform to the applicable requirements of the AISC "Specification for Structural Steel Buildings" and AISC "Code of Standard Practice". All temporary bracing, guys and bolts as may be necessary to ensure the safety of the structure until the permanent connections have been made shall be provided by the CONTRACTOR.

B. Structural members shall be set accurately to the lines and elevations indicated. The various members shall be aligned and adjusted to form a part of a complete frame or structure before permanently fastened.

C. No cutting of structural steel members in the field will be allowed except by the written approval of the ENGINEER.

D. Bearing surfaces and other surfaces which will be in permanent contact shall be cleaned before assembly.

E. Field welding shall not be permitted unless specifically indicated in the Drawings or approved in writing by the ENGINEER. All field welding shall comply with Section 05050, Metal Fastening.

F. All bolted connections shall use high strength bolts in accordance with Section 05050, Metal Fastening. Bolts shall be fully pretensioned according to the AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts".

G. All field connections shall be accurately fitted up before being bolted. Drifting shall be only such as will bring the parts into position and shall not be sufficient to enlarge the holes or to distort the metal. All unfair holes shall be drilled or reamed.

H. Misfits at Bolted Connections

1. Where misfits in erection bolting are encountered, the ENGINEER shall be immediately notified. The CONTRACTOR shall submit a method to remedy the misfit for review by the ENGINEER. The ENGINEER will determine whether the remedy is acceptable or if the member must be refabricated.

2. Incorrectly sized or misaligned holes in members shall not be enlarged by burning or by the use of drift pins. The CONTRACTOR shall notify the ENGINEER immediately and shall submit a proposed method of remedy for review by the ENGINEER.

3. Where misalignment between anchor bolts and bolt holes in steel members are encountered, the ENGINEER shall be immediately notified. The CONTRACTOR shall submit a method to remedy the misalignment for review by the ENGINEER.

I. Grouting of Base Plates and Bearing Plates

1. The bottom surface of the plates shall be cleaned of all foreign materials, and concrete or masonry bearing surface shall be cleaned of all foreign materials and roughened to improve bonding.

2. Accurately set all base and bearing plates to designated levels with steel wedges or leveling plates.

3. Baseplates shall be grouted with non-shrink grout to assure full uniform bearing. Grouting shall be done prior to placing loads on the structure.

4. Anchor bolts shall be tightened after the supported members have been positioned and plumbed and the non-shrink grout has attained its specified strength.

J. Where finishing is required, assembly shall be completed including bolting and welding of units before start of finishing operations.

3.5 PAINTING

A. Painting shall be performed according to Section 09900, Painting and the following additional requirements.

1. Contact Surfaces: Contact surfaces such as at field connections, shall be cleaned and primed but not painted.

2. Finished Surfaces: Machine finished surfaces shall be protected against corrosion by a rust-inhibiting coating which is easily removed prior to erection or which has characteristics that make removal unnecessary prior to erection.

3. Surfaces Adjacent to Field Welds: Surfaces within 2 inches of any field weld location shall be free of materials that would prevent proper welding or produce objectionable fumes while welding is being done.

END OF SECTION

SECTION 05500

METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Miscellaneous steel framing and supports.

2. Miscellaneous steel trim.

3. Loose bearing and leveling plates.

4. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.

5. Steel weld plates and angles for casting into concrete.

1.2 REFERENCES

A. AISC - Specification for Structural Steel Buildings

B. AISI - Specifications for the Design of Cold Formed Steel Structural Members

C. Aluminum Association Specifications for Aluminum Structures

1.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design ladders, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated. Design shall be signed and sealed by a Professional Engineer in the State of Michigan.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Paint products.

2. Grout.

B. Shop Drawings: Show fabrication and installation details for metal fabrications.

1. Include detailed plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

C. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation

1.5 QUALITY ASSURANCE

A. Metal Bar Grating Standards: Comply with NAAMM MBG 531, "Metal Bar Grating Manual."

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces without blemishes.

B. When galvanizing is called for, provide hot galvanized coatings that conform to the requirements of ASTM A123 or ASTM A446.

2.2 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A36.

B. Stainless-Steel Bars and Shapes: ASTM A276.

C. Rolled-Steel Floor Plate: ASTM A786, rolled from plate complying with ASTM A36 or ASTM A283, Grade C or D.

D. Steel Tubing: ASTM A500, cold-formed steel tubing.

E. Steel Pipe: ASTM A53, standard weight (Schedule 40) unless otherwise indicated.

2.3 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and perimeter concrete and masonry walls.

1. Provide stainless-steel fasteners for fastening galvanized metals.

B. Cast-in-Place Anchors in Concrete: Threaded type unless otherwise indicated; stainless steel castings. Provide bolts, washers, and shims as needed, all stainless steel.

C. Post-Installed Anchors: Chemical adhesive set anchors.

1. Material for all Locations: Type 304 stainless steel, unless otherwise indicated.

2.4 MISCELLANEOUS MATERIALS

A. Low-Emitting Materials: Paints and coatings shall comply with Section 9900 Painting.

B. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187.

C. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

D. Concrete: Comply with requirements in Section 03300 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 4000 psi.

2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.

C. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended.

D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Locate joints where least conspicuous.

E. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

F. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors not less than 24 inches o.c.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

2.13 STEEL AND IRON FINISHES

A. Shop prime iron and steel items in accordance with Section 9900 Painting.

B. Preparation for Shop Priming: Prepare surfaces to comply with Section 9900 Painting

PART 3 - EXECUTION

3.1 FABRICATION

A. All measurements and dimensions shall be based on field conditions and shall be verified by the CONTRACTOR prior to fabrication. Such verification shall include coordination with adjoining work.

B. All fabricated work shall be shop fitted together as much as practicable, and delivered to the field, complete and ready for erection. All miscellaneous items such as stiffeners, fillets, connections, brackets, and other details necessary for a complete installation shall be provided.

C. All work shall be fabricated and installed in a manner that will provide for expansion and contraction, prevent shearing of bolts, screws, and other fastenings, ensure rigidity, and provide a close fit of sections.

D. Finished members shall conform to the lines, angles, and curves shown on the Drawings and shall be free from distortions of any kind.

E. All shearings shall be neat and accurate, with parts exposed to view neatly finished. Flame cutting is allowed only when performed utilizing a machine.

F. All shop connections shall be welded unless otherwise indicated on the Drawings or specified herein. Bolts and welds shall conform to Section 05050, Metal Fastening. All fastenings shall be concealed where practicable.

G. Fabricated items shall be shop painted when specified in Section 09900, Painting.

H. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended.

3.2 INSTALLATION

A. Assembly and installation of fabricated system components shall be performed in strict accordance with manufacturer's recommendations.

B. All miscellaneous metalwork shall be erected square, plumb and true, accurately fitted, adequately anchored in place, and set at proper elevations and positions

C. Metal work shall be field painted when as specified in accordance with Section 09900, Painting.

3.3 INSTALLING BEARING AND LEVELING PLATES

A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.

B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.

C. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

END OF SECTION

SECTION 9900

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: Carboline or Tnemec. No substitutions.

C. Paint Applications

Schedule M1: Submerged Metal

Paint all submerged metal provided or refurbished for the project including, but not limited to: upstream face of tainter gate.

See schedule for colors.

Schedule M2: Exterior Metal

Paint all non-submerged metal provided or refurbished for the project including, but not limited to: downstream face of tainter gate and all support structures, hoist shaft and chain guard. Includes all anchor pins and rods, plates and other appurtenances.

See schedule for colors.

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 so as 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-HilI.

C. The CONTRACTOR shall hire an independent paint inspector for the project. Nelson Tank Engineering and Consulting; and Dixon Engineering are pre-approved. Inspector shall produce a report for all findings and submit copies to CONTRACTOR and ENGINEER. Inspector's scope shall include checking the following:

1. Surface preparation.

2. Conditions, including ambient and surface temperatures, humidity, and other factors that might affect coatings.

3. Thickness of all coatings.

4. Coating surface. Flaws such as holidays, runs, etc, shall be flagged for correction and reinspected after correction.

1.4 SUBMITTALS

A. Prior to ordering and delivering paint materials to the project site, submit the following:

5. Manufacturer literature demonstrating compliance with these Specifications and indicating paint formulation, rate of coverage, recommended uses and recommended application method.

6. 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 Grand 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 Grand 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.

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.

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-SP10 Near White Blast Cleaning**

Paint Manufacturer	Application	Product Name	Product Type	No. Of Coats	Dry Mils/ Coat	Comments
Carboline	Primer	Carbozinc 859	Zinc	One	3 – 5	
Carboline	Stripe*	Carbogard 60	Polyamide Epoxy	One		Owner to select
Carboline	Finish	Carbogard 60	Polyamide Epoxy	Two	4 – 6	Owner to select

TOTAL SYSTEM THICKNESS **11 – 17***

*Note: All edges and corners shall be stripe coated. Specified millage does not include stripe coating.

PAINT SCHEDULE M2

SERVICE: EXTERIOR METAL

Surface Preparation: SSPC-SP10 Near White Blast Cleaning

Paint Manufacturer	Application	Product Name	Product Type	No. Of Coats	Dry Mils/ Coat	Comments
Carboline	Primer	Carbozinc 859	Zinc	One	3 – 5	
Carboline	Intermediate	Carbogard 60	Polyamide Epoxy	One	4 – 6	white
Carboline	Stripe*	Carbothane 134	Polyurethane	One		Owner to select up to two colors.
Carboline	Finish	Carbothane 134	Polyurethane	Two	2 – 3	Owner to select up to two colors.
		TOTAL SYSTEM THICKNESS			**11 – 17***	

*Note: All edges and corners shall be stripe coated. Specified millage does not include stripe coating.

SECTION 015601

TAINTER GATE ACCESSORIES

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Accessories pertinent to construction of the new tainter gate.

1.2 RELATED SECTIONS

A. Section 05010 Metal Materials

B. Section 05050 Metal Fastening

C. Section 05120 Structural Steel

D. Section 05500 Metal Fabrications

E. Section 09900 Painting

1.3 SUBMITTALS

A. Submit shop drawings for all custom work specified in this Section as per the requirements of Section 01330 – Submittal Procedures. Where standard products are specified and no modification will be required, submit manufacturer's literature.

1.4 PRODUCT HANDLING AND STORAGE

A. Ship all prefabricated miscellaneous metal items in a protected manner to prevent damage prior to installation. Store materials awaiting installation so that they will not be adversely affected by weathering.

PART 2 – PRODUCTS

2.1 GENERAL PROVISIONS

A. Unless otherwise noted on the Drawings or in these Specifications, use steel for miscellaneous metal items.

B. For structural steel shapes, plates, and bars, conform to the requirements of ASTM A36 "Specification for Structural Steel".

C. Bolt or weld all shop-fabricated structural metal assemblies. For framing bolts, use bolts that conform to ASTM A307 (where normal strength bolts can be used), or ASTM A325N (where high-strength bolts are required). For welds, use AWS A5.1, E70XX welding electrodes.

2.2 SELF-LUBRICATED PIN BEARINGS

A. Provide pre-lubricated, maintenance free bearings of size shown on the drawings.

B. Bearings shall be Lubrite Self-lubricating Bearings designed and manufactured by Lubrite Technologies, 18649 Brake Shoe Road, Meadville, PA 16335. They shall be suitable for exposure to outdoor conditions at an operational dam, including rain, icing, mist, UV and

extreme hot and cold temperatures. The bearings shall be a standard product of an established bearing manufacturer with a successful performance record of ten (10) years in similar applications.

C. The bronze alloy employed in the manufacture of the bushings shall be High Strength Manganese Bronze centrifugally cast to the requirements of ASTM B22 C86300 and ASTM B271-C86300.

D. The lubricant shall consist of a combination of solids having non-deteriorating characteristics as well as inherent lubricating qualities. The lubricant shall be capable of withstanding the efforts of long-term atmospheric exposure and submersion in seawater, fresh water, and most solvents. Graphite, molybdenum disulfide or other ingredients that tend to promote electrolytic or chemical action are prohibited. The use shellac, tars, solvents or other non-lubricating binder materials will not be acceptable. The type G10 lubricant shall have a Durometer hardness of 90 on the shore "A" Scale when tested in accordance with ASTM D2240.

E. The lubricant shall cover 100 percent of the bearing area and be dense and lubricative. The lubricant shall not be scraped or machined in any way after manufacture. The surface roughness of the base metal under the lubricant layer shall not exceed 63 micro-inches.

F. The bushings shall have a general design capacity of not more than 8,000 psi at 10 surface feet per minute. The static coefficient of friction between the bushing and the journal shall not exceed 0.07 when subjected to a design unit loading of 2.0 KSI or greater.

G. The bushing wall thickness, running fit, and tolerances shall be as recommended by the manufacturer. The manufacturer shall review the specified interference fit for the bushing into the collar and verify its acceptability for the furnished bearing.

H. The CONTRACTOR shall install the bearing into the trunnion collar with interference fit as specified.

I. Certificate of Compliance and Certified Mill Test Reports shall be furnished.

J. Press fits into collars shall be verified by the bearing manufacturer based on actual bearing material and dimensions. The manufacturer shall provide to the ENGINEER for review calculations showing computed stress in the collars as indicated on the drawings. Stress calculations shall include allowances for thermal expansion and contraction.

2.3 SEALS

A. Seals

1. New resilient seals shall be placed along both sides and the bottom of the gate to prevent leakage. The seal attaching hardware shall be stainless and attached in a manner to permit replacement of the seals.

2. Seals shall be of the size and shape as shown on the Drawings, custom manufactured to fit correctly in locations as identified.

3. Seals shall be compounded of natural rubber, synthetic polyisoprene, or a blend of both, and shall contain reinforcing carbon black, zinc oxide, accelerators, antioxidants, vulcanizing agents and plasticizers. Seals shall meet the following physical characteristics:

PROPERTY	TEST VALUE	TEST METHOD
Tensile strength	2500 psi (min)	ASTM D412
Elongation at Break	450% (min)	ASTM D412
300% Modulus	900 psi (min)	ASTM D412
Durometer Hardness (shore type A)	65 +/- 3	ASTM D2240
Water Absorption	5% by weight (max)	ASTM D471
Compression Set	30% (max)	ASTM D395
Tensile strength (after aging 48 hrs)	80% tensile strength (min)	ASTM D572

4. Seals shall be manufactured by Synaflex Rubber Products Company, Talladega, Alabama.

B. Seal hardware shall be 316 Stainless Steel, size, location and spacing as shown on the Drawings.

2.4 HOIST CHAIN

A. Furnish hoist chain as sized on the Drawings.

B. Hoist chain shall be welded link, Grade 100 alloy steel. Chains shall be certified proof tested (e.g., 45,200 lbs for 5/8" nom. size) before delivery.

C. Chains shall be fitted with oblong master link and coupling link, sized as indicated on the drawings.

D. All chains, master links and couplings shall be painted.

E. Chains, links and accessories shall be manufactured by Laclede Chain Manufacturing, or equal.

PART 3 – EXECUTION

3.1 TRUNNION PIN BEARINGS

A. Before grouting, pin alignment shall be verified using a continuous steel pipe connection between the pins. The CONTRACTOR shall verify alignment of embedded pins before installation of gate arms.

B. The CONTRACTOR shall verify rotation of gate arms before making final connections to gate structure.

C. Following operation of gate under normal load for 10 open-close cycles minimum, the pin covers shall be removed and the bearings inspected for alignment and gap.

3.2 SEALS

A. Seals shall be installed with preset as indicated on the Drawings.

B. Under full head, seals shall be inspected for leaks and adjusted as necessary.

C. Following initial leak inspection, seal contact shall be checked through the full range of gate motion.

3.3 HOIST CHAIN

A. The CONTRACTOR shall adjust chains for smooth and kink-free spooling.

B. Length of chain shall be carefully measured and bottom of chain elevations checked at various positions through the hoist travel to ensure even pull tension on both sides through the full range of motion. Adjustments to chain shall be made only by removing links, or by adding couplings or links as pre-approved by the ENGINEER. No deformation of links or couplings will be permitted.

END OF SECTION

APPENDIX A

Paint Lead Test Results

ANALYTICAL LABORATORY REPORT

CUSTOMER: Stantec
3754 Ranchero Drive
Ann Arbor, MI 48108

DATE RECEIVED: Wednesday, November 14, 2012
PO/PROJECT #: 2075116502
SUBMITTAL #: 2012-11-14-012

LAB NUMBER: AB39806

Sampled By: Paul J. Malocha
Job Location: Ann Arbor, MI
Sample Identification: 5 - Geddes door
Date Sampled: Friday, November 9, 2012
Sample Description: Paint Chips

Preparation Method: EPA 3050B-P-M (Acid Digestion for Paints)
Analysis Method: EPA 6010C (ICP-AES Method for Determination of Metals)
Date Analyzed: Wednesday, November 21, 2012

ELEMENT	RESULT (by weight)	REPORTING LIMIT (RL)
Lead	0.033 %	0.0064 %

LAB NUMBER: AB39807

Sampled By: Paul J. Malocha
Job Location: Ann Arbor, MI
Sample Identification: 6 - Geddes lifts
Flagged Data: Substrate could not be completely removed.
Date Sampled: Friday, November 9, 2012
Sample Description: Paint Chips

Preparation Method: EPA 3050B-P-M (Acid Digestion for Paints)
Analysis Method: EPA 6010C (ICP-AES Method for Determination of Metals)
Date Analyzed: Wednesday, November 21, 2012

ELEMENT	RESULT (by weight)	REPORTING LIMIT (RL)
Lead	0.0074 %	0.0025 %

ANALYTICAL LABORATORY REPORT

CUSTOMER: Stantec
3754 Ranchero Drive
Ann Arbor, MI 48108

DATE RECEIVED: Wednesday, November 14, 2012
PO/PROJECT #: 2075116502
SUBMITTAL #: 2012-11-14-012

Unless otherwise noted, the condition of each sample was acceptable upon receipt, all laboratory quality control requirements were met, and sample results have not been adjusted based on field blank or other analytical blank results. Individual sample results relate only to the sample as received by the laboratory.

Tests Reviewed By: Michael J. Swiech, QA/QC Manager Michael J. Swiech 2012.11.26 13:23:35 -05'00'

CCC&L has obtained accreditation under the following programs:

- **National Lead Laboratory Accreditation Program (NLLAP)**
  ELLAP: AIHA Laboratory ELLAP Accreditation Program Laboratory, ID#101030 (www.aiha.org)
  OH: Ohio Department of Health Lead Poisoning Prevention Program, Approval #E10013 (www.odh.ohio.gov)
- **AIHA Laboratory IHLAP Accreditation Program** (www.aiha.org)
  IHLAP: Laboratory ID#101030
- **National Environmental Laboratory Accreditation Program (NELAP)**
  NY: State of New York Department of Health, Laboratory ID#11609 (Serial # 46417 through 46421) (518-485-5570)
  LA: State of Louisiana Department of Environmental Quality, Laboratory ID#180321 (Certificate 05036) (www.deq.louisiana.gov)
  OK: Oklahoma Department of Environmental Quality, Laboratory ID#9993 (Certificate 2012-034) (www.deq.state.ok.us)

The accreditations pertain only to the testing performed for the elements, and in accordance with the test methods, listed in the table below. Testing which is performed by CCC&L according to other test methods, or for elements which are not included in the table below fall outside of the current scope of laboratory accreditation. Customers are encouraged to verify the current accreditation status with the individual accreditation programs by calling or visiting the appropriate website for the applicable program.

SCOPE OF ACCREDITATION

Air and Emissions

Element/Test	Method	Accreditation(s)
Particulates (PM10)	40 CFR 50 Appendix J	NY, LA
Total Suspended Particulates (TSP)	40 CFR 50 Appendix B	NY, LA
Lead in Airborne Dust	NIOSH 7300	ELLAP, OH, NY, LA
Lead in Airborne Dust	EPA600/R-93/200	ELLAP, OH
Metals in Airborne Dust	NIOSH 7300/ EPA 6010B or EPA 6010C	IHLAP
Metals in Airborne Dust	EPA600/R-93/200/ EPA 6010B or EPA 6010C	IHLAP

Solid Chemical Materials

Element/Test	Method	Accreditation(s)
TCLP	EPA 1311(Sample Preparation Method)	NY, LA, OK
Acid Digestion	EPA 3050B	NY, LA
Lead in Soil	EPA 3050B/EPA 6010C	NY, LA, OK
Lead in Soil	EPA 3050B/EPA 6010B or EPA 6010C	ELLAP, OH, NY, LA
Lead in Paint	EPA 3050B/EPA 6010B or EPA 6010C	ELLAP, OH, NY, LA
Lead in Dust Wipes	EPA 6010B or EPA 6010C	NY, LA
Lead in Dust Wipes	EPA600/R-93/200/EPA 6010B or 6010C	ELLAP, OH

Non-Potable Water / Analysis by ICP

Element/Test	Method	Accreditation(s)	Method	Accreditation(s)
Arsenic	EPA 6010B	NY	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK
Barium	EPA 6010B	NY	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK
Cadmium	EPA 6010B	NY	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK
Chromium	EPA 6010B	NY	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK
Copper	EPA 6010B	NY	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK
Lead	EPA 6010B	NY	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK
Mercury	EPA 245.1 Rev.3	NY, LA, OK		
Mercury	EPA 7470A	NY, LA, OK		
Nickel	EPA 6010B	NY	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK
Selenium	EPA 6010B	NY	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK
Silver	EPA 6010B	NY	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK
Zinc	EPA 6010B	NY	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK
Acid Digestion	EPA 3010A	NY, LA		