CITY OF ANN ARBOR
INVITATION TO BID

WTP - LIME RESIDUAL REMOVAL
CONTRACT NO. 1 – SITE MODIFICATIONS

ITB No. 4560

Due Date: Wednesday, JANUARY 16, 2019 at 10:00 AM

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

Issued By:

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

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NOTICE OF PRE-BID CONFERENCE

A pre-bid conference for this project will be held on **Thursday, January 3, 2018 at 1:00 PM** at **The City of Ann Arbor Water Treatment Plant, 919 Sunset Road, Ann Arbor, MI 48103.**

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.

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

Preparation of Bids

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

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

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

Questions or Clarifications / Designated City Contacts

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

All questions shall be due on or before **Monday, January 7, 2018 at 2:00 PM** and should be addressed as follows:

Specification/Scope of Work questions emailed to **joe.siwek@tetratech.com**
Bid Process and Compliance questions emailed to cspencer@a2gov.org

Any error, omissions or discrepancies in the specification discovered by a prospective contractor and/or service provider shall be brought to the attention of **Joseph Siwek** at **joe.siwek@tetratech.com** after discovery as possible. Further, the contractor and/or service provide shall not be allowed to take advantage of errors, omissions or discrepancies in the specifications.

Addenda

If it becomes necessary to revise any part of the ITB, notice of the Addendum will be posted to Michigan Inter-Governmental Trade Network (MITN) www.mitn.info 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 **Wednesday, January 16 at 10:00 AM EST.** 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 **Four (4)** Bid copies in a sealed envelope clearly marked: **ITB No. 4560 WTP LIME RESIDUAL REMOVAL– CONTRACT NO. 1 – SITE MODIFICATIONS.**

Bids must be addressed and delivered to:

City of Ann Arbor
Procurement Unit,
c/o Customer Services, 1st Floor
301 East Huron Street
Ann Arbor, MI 48104

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

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

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

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

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

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

Award

The City intends to award a Contract(s) to the lowest responsible Bidder(s). On multi-divisional contracts, separate divisions may be awarded to separate Bidders. The City may also utilize alternatives offered in the Bid Forms, if any, to determine the lowest responsible Bidder on each division, and award multiple divisions to a single Bidder, so that the lowest total cost is achieved for the City. For unit price bids, the Contract will be awarded based upon the unit prices and the lump sum prices stated by the bidder for the work items specified in the bid documents, with consideration given to any alternates selected by the City. If the City determines that the unit price for any item is materially different for the work item bid than either other bidders or the general

market, the City, in its sole discretion, in addition to any other right it may have, may reject the bid as not responsible or non-conforming.

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

Qualifications

The city will evaluate 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. Completion of past projects including pressure piping construction and site work is preferred. Bidders shall also submit the attached form, "Section 5-References," which identifies a minimum of three projects completed in the past 5 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.

Official Documents

The City of Ann Arbor officially distributes bid documents from the Procurement Unit or through the Michigan Intergovernmental Trade Network (MITN). Copies of the bid documents obtained from any other source are not Official copies. Addenda and other bid information will only be posted to these official distribution sites. If you obtained City of Ann Arbor Bid documents from other sources, it is recommended that you register on www.MITN.info and obtain an official Bid. Bidders do not need to be shown on the plan holders list provided by MITN to be considered an official plan holder.

Bid Security

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

Withdrawal of Bids

After the time of opening, no Bid may be withdrawn for the period of Ninety (90) days.

Contract Time

Time is of the essence in the performance of the work under this Contract. The available time for work under this Contract is indicated on page C-1, Article III of the Contract. If these time requirements cannot be met, the Bidder must stipulate on Bid Form Section 3 - Time Alternate its schedule for performance of the work. Consideration will be given to time in evaluating bids.

Liquidated Damages

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

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

Chapter 112 of the City Code.

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

Human Rights Information

All contractors proposing to do business with the City shall satisfy the contract compliance administrative policy adopted by the City Administrator in accordance with the Section 9:158 of the Ann Arbor City Code. Breach of the obligation not to discriminate as outlined in Section 5, beginning at page GC-2 shall be a material breach of the contract. Contractors are required to post a copy of Ann Arbor's Non-Discrimination Ordinance attached at all work locations where its employees provide services under a contract with the City.

Wage Requirements

Section 4, beginning at page GC-1, outlines the requirements for payment of prevailing wages and for payment of a "living wage" to employees providing service to the City under this contract. The successful bidder and its subcontractors must comply with all applicable requirements and provide proof of compliance.

Pursuant to Resolution R-16-469 all public improvement contractors are subject to prevailing wage and will be required to provide to the City payroll records sufficient to demonstrate compliance with the prevailing wage requirements. Use of the Prevailing Wage Form provided in the Appendix section or a City-approved equivalent will be required along with wage rate interviews.

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

For the purposes of this ITB the Construction Type of Heavy will apply.

Conflict Of Interest Disclosure

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

Major Subcontractors

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

City.

Debarment

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

Disclosures

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

Bid Protest

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

Any inquiries or requests regarding this procurement should be only submitted in writing to the Designated City Contacts provided herein. Attempts by any prospective bidder to initiate contact with anyone other than the Designated City Contacts provided herein that the bidder believes can influence the procurement decision, e.g., Elected Officials, City Administrator, Selection Committee Members, Appointed Committee Members, etc., may lead to immediate elimination from further consideration.

Cost Liability

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

Reservation of Rights

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

Idlefree Ordinance

The City of Ann Arbor adopted an idling reduction Ordinance that goes into effect July 1, 2017. The full text of the ordinance (including exemptions) can be found at: www.a2gov.org/idlefree.

Under the ordinance, No Operator of a Commercial Vehicle shall cause or permit the Commercial Vehicle to Idle:

(a) For any period of time while the Commercial Vehicle is unoccupied; or

(b) For more than 5 minutes in any 60-minute period while the Commercial Vehicle is occupied.

In addition, generators and other internal combustion engines are covered

(1) Excluding Motor Vehicle engines, no internal combustion engine shall be operated except when it is providing power or electrical energy to equipment or a tool that is actively in use.

Environmental Commitment

The City of Ann Arbor recognizes its responsibility to minimize negative impacts on human health and the environment while supporting a vibrant community and economy. The City further recognizes that the products and services the City buys have inherent environmental and economic impacts and that the City should make procurement decisions that embody, promote, and encourage the City's commitment to the environment.

The City encourages potential vendors to bring forward emerging and progressive products and services that are best suited to the City's environmental principles.

INVITATION TO BID

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

Ladies and Gentlemen:

The undersigned, as Bidder, declares that this Bid is made in good faith, without fraud or collusion with any person or persons bidding on the same Contract; that this Bidder has carefully read and examined the bid documents, including City Nondiscrimination requirements and Declaration of Compliance Form, Living Wage requirements and Declaration of Compliance Form, Prevailing Wage requirements and Declaration of Compliance Form, Vendor Conflict of Interest Form, Notice of Pre-Bid Conference, Instructions to Bidders, Bid, Bid Forms, Contract, Bond Forms, General Conditions, Standard Specifications, Detailed Specifications, all Addenda, and the Plans (if applicable) and understands them. The Bidder declares that it conducted a full investigation at the site and of the work proposed and is fully informed as to the nature of the work and the conditions relating to the work's performance. The Bidder also declares that it has extensive experience in successfully completing projects similar to this one.

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

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

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

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

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

The Bidder declares that it has become familiar with the City Conflict of Interest Disclosure Form and certifies that the statement contained therein is true and correct.

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

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

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

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

SIGNED THIS _____ DAY OF _____, 201_.

_____	_____
Bidder's Name	Authorized Signature of Bidder
_____	_____
Official Address	(Print Name of Signer Above)
_____	_____
Telephone Number	Email Address for Award Notice

LEGAL STATUS OF BIDDER

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

Bidder declares that it is:

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

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

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

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

_____

_____

_____

_____

_____

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

Authorized Official

_____ **Date** _____, 201_

(Print) Name _____ Title _____

Company: _____

Address: _____

Contact Phone ( ) _____ Fax ( ) _____

Email _____

BID FORM

Section 1 – Schedule of Prices

Project: WTP Lime Residual Removal Project – Contract No. 1, Site Modifications
ITB No.: 4560

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 a base bid and alternate bid in any manner the City believes to be in its best interest.

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

Item No.	Item Description	Qty	Unit	Unit Price	Total Price
1	General Conditions (Max, $15,000)	1	LS	$	$
2	Allowance – Force Main Repair	1	ALW	$	$ 30,000
3	Allowance – Street Light Relocation	1	ALW	$	$ 10,000
4	Allowance – Utility Relocation	1	ALW	$	$ 10,000
5	Minor Traffic Control	1	LS	$	$
6	Audiovisual Coverage	1	LS	$	$
7	Force Main Performance Testing	1	LS	$	$
8	WTP Manhole Modifications	1	LS	$	$
9	Lagoon Manhole Modifications	1	LS	$	$
10	Soil Erosion and Sedimentation Control Plan	1	LS	$	$
11	Pavement Removal	30	SYD	$	$
12	Curb and Gutter Removal	300	FT	$	$
13	Sidewalk Removal	30	SYD	$	$
14	Sidewalk, 8-inch	270	SF	$	$
15	Tree Removal	10	EA	$	$
16	Tree Relocation	5	EA	$	$
17	Protective Fencing	150	LF	$	$
18	Fence Removal	70	FT	$	$

19	Gate Removal	1	EA	$	$
20	8" Aggregate Base	215	SYD	$	$
21	HMA	50	Ton	$	$
22	72" Chain Link Fence	50	FT	$	$
23	72" Chain Link Slide Gate	1	EA	$	$
24	Pavement Markings	1	LS	$	$
25	Closeout	1	LS	$	$
26	Certified Payroll Compliance and Reporting	1	LS	$	$
TOTAL BASE BID (ITEMS 1 THROUGH 26)					**$**

ESTIMATED TOTAL **$_____**

BID FORM

Section 2 – Material, Equipment and Environmental 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.

If an environmental alternative is bid the City strongly encourages bidders to provide recent examples of product testing and previous successful use for the City to properly evaluate the environmental alternative. Testing data from independent accredited organizations are strongly preferred.

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 _____ Date _____

BID FORM

Section 3 - Time Alternate

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

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

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

Signature of Authorized Representative of Bidder _____Date _____

BID FORM

Section 4 - Major Subcontractors / Suppliers

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

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

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

Subcontractor (Name and Address)	Work	Amount
_____	Paving	_____
_____	Excavation	_____
_____	Valve Manufacturer	_____
_____	Pipe Construction	_____
_____	Fence Installer	_____
_____	Pavement Markings	_____

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

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

Signature of Authorized Representative of Bidder_____ Date _____

BID FORM

Section 5 – References

Include a minimum of 3 reference from similar project completed within the past 5 years.

[Refer also to Instructions to Bidders for additional requirements, if any]

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

SAMPLE STANDARD CONTRACT

If a contract is awarded, the selected contractor will be required to adhere to a set of general contract provisions which will become a part of any formal agreement. These provisions are general principles which apply to all contractors of service to the City of Ann Arbor such as the following:

CONTRACT

THIS AGREEMENT is made on the _____ day of _____, 201_, 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 WTP Lime Residual Removal Project – Contract No. 1 – Site Modifications, ITB 4560 in accordance with the requirements and provisions of the following documents, including all written modifications incorporated into any of the documents, which are incorporated as part of this Contract:

Non-discrimination and Living Wage Declaration of Compliance Forms (if applicable)
Vendor Conflict of Interest Form
Prevailing Wage Declaration of Compliance Form (if applicable)
Bid Forms
Contract and Exhibits
Bonds
General Conditions
Standard Specifications
Detailed Specifications
Plans
Addenda

ARTICLE II - Definitions

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

Project means **WTP LIME RESIDUAL REMOVAL PROJECT – CONTRACT NO. 1 – SITE MODIFICATIONS, ITB No. 4560**

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. The anticipated notice to proceed date is June 15, 2019.

(B) The entire work for this Contract shall be completed within **Sixty (60)** consecutive calendar days from Notice to Proceed.

(C) Failure to complete all the work within the time specified above, including any extension granted in writing by the Supervising Professional, shall obligate the

Contractor to pay the City, as liquidated damages and not as a penalty, an amount equal to **$500** for each calendar day of delay in the completion of all the work. If any liquidated damages are unpaid by the Contractor, the City shall be entitled to deduct these unpaid liquidated damages from the monies due the Contractor.

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

ARTICLE IV - The Contract Sum

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

_____Dollars ($_____)

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

ARTICLE V - Assignment

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

ARTICLE VI - Choice of Law

This Contract shall be construed, governed, and enforced in accordance with the laws of the State of Michigan. By executing this agreement, the Contractor and the City agree to venue in a court of appropriate jurisdiction sitting within Washtenaw County for purposes of any action arising under this Contract. The parties stipulate that the venue referenced in this Contract is for convenience and waive any claim of non-convenience.

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

ARTICLE VII - Relationship of the Parties

The parties of the Contract agree that it is not a Contract of employment but is a Contract to accomplish a specific result. Contractor is an independent Contractor performing services for the City. Nothing contained in this Contract shall be deemed to constitute any other relationship between the City and the Contractor.

Contractor certifies that it has no personal or financial interest in the project other than the compensation it is to receive under the Contract. Contractor certifies that it is not, and shall not become, overdue or in default to the City for any Contract, debt, or any other obligation to the City including real or personal property taxes. City shall have the right to set off any such debt against compensation awarded for services under this agreement.

ARTICLE VIII - Notice

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

ARTICLE IX - Indemnification

To the fullest extent permitted by law, Contractor shall indemnify, defend and hold harmless the City, its officers, employees and agents harmless from all suits, claims, judgments and expenses including attorney's fees resulting or alleged to result, in whole or in part, from any act or omission, which is in any way connected or associated with this Contract, by the Contractor or anyone acting on the Contractor's behalf under this Contract. Contractor shall not be responsible to indemnify the City for losses or damages caused by or resulting from the City's sole negligence. The provisions of this Article shall survive the expiration or earlier termination of this contract for any reason.

ARTICLE X - Entire Agreement

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

FOR CONTRACTOR

By_____

Its:_____

FOR THE CITY OF ANN ARBOR

By_____
Christopher Taylor, Mayor

By_____
Jacqueline Beaudry, City Clerk

Approved as to substance

By_____

Howard S. Lazarus, City Administrator

[signatures continue on next page]

By_____

Craig Hupy, Public Services Area Administrator

Approved as to form and content

_____

Stephen K. Postema, City Attorney

PERFORMANCE BOND

(1) _____ of _____ (referred to as "Principal"), and _____, a corporation duly authorized to do business in the State of Michigan (referred to as "Surety"), are bound to the City of Ann Arbor, Michigan (referred to as "City"), for

$ _____, the payment of which Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by this bond.

(2) The Principal has entered a written Contract with the City dated _____, 201_, for: _____ _____ and this bond is given for that Contract in compliance with Act No. 213 of the Michigan Public Acts of 1963, as amended, being MCL 129.201 et seq.

(3) Whenever the Principal is declared by the City to be in default under the Contract, the Surety may promptly remedy the default or shall promptly:

(a) complete the Contract in accordance with its terms and conditions; or

(b) obtain a bid or bids for submission to the City for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, arrange for a Contract between such bidder and the City, and make available, as work progresses, sufficient funds to pay the cost of completion less the balance of the Contract price; but not exceeding, including other costs and damages for which Surety may be liable hereunder, the amount set forth in paragraph 1.

(4) Surety shall have no obligation to the City if the Principal fully and promptly performs under the Contract.

(5) Surety agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder, or the specifications accompanying it shall in any way affect its obligations on this bond, and waives notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work, or to the specifications.

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

_____	_____
(Name of Surety Company)	(Name of Principal)
By _____	By _____
(Signature)	(Signature)
Its _____	Its _____
(Title of Office)	(Title of Office)
Approved as to form:	Name and address of agent:
_____	_____
Stephen K. Postema, City Attorney	_____
	_____

LABOR AND MATERIAL BOND

(1) _____

of _____(referred to as "Principal"), and _____, a corporation duly authorized to do business in the State of Michigan, (referred to as "Surety"), are bound to the City of Ann Arbor, Michigan (referred to as "City"), for the use and benefit of claimants as defined in Act 213 of Michigan Public Acts of 1963, as amended, being MCL 129.201 et seq., in the amount of

$ _____, for the payment of which Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by this bond.

(2) The Principal has entered a written Contract with the City, dated _____, 201_, for _____

_____; and this bond is given for that Contract in compliance with Act No. 213 of the Michigan Public Acts of 1963 as amended;

(3) If the Principal fails to promptly and fully repay claimants for labor and material reasonably required under the Contract, the Surety shall pay those claimants.

(4) Surety's obligations shall not exceed the amount stated in paragraph 1, and Surety shall have no obligation if the Principal promptly and fully pays the claimants.

SIGNED AND SEALED this _____ day of _____, 201_

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

Approved as to form:

_____
Stephen K. Postema, City Attorney

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

Name and address of agent:

_____

_____

_____

GENERAL CONDITIONS

Section 1 - Execution, Correlation and Intent of Documents

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

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

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

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

Section 2 - Order of Completion

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

Section 3 - Familiarity with Work

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

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

Section 4 - Wage Requirements

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

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

Pursuant to Resolution R-16-469 all public improvement contractors are subject to prevailing wage and will be required to provide to the City payroll records sufficient to demonstrate compliance with the prevailing wage requirements. A sample Prevailing Wage Form is provided in the Appendix herein for reference as to what will be expected from contractors. Use of the Prevailing Wage Form provided in the Appendix section or a City-approved equivalent will be required along with wage rate interviews.

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

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

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

Section 5 - Non-Discrimination

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

Section 6 - Materials, Appliances, Employees

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

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

Adequate sanitary facilities shall be provided by the Contractor.

Section 7 - Qualifications for Employment

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

Section 8 - Royalties and Patents

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

Section 9 - Permits and Regulations

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

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

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

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

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

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

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

Section 11 - Inspection of Work

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

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

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

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

Section 12 - Superintendence

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

Section 13 - Changes in the Work

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

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

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

Section 14 - Extension of Time

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

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

(2) When the work is suspended as provided in Section 20;

(3) When the work of the Contractor is delayed on account of conditions which could not have been foreseen, or which were beyond the control of the Contractor, and which were not the result of its fault or negligence;

(4) Delays in the progress of the work caused by any act or neglect of the City or of its employees or by other Contractors employed by the City;

(5) Delay due to an act of Government;

(6) Delay by the Supervising Professional in the furnishing of plans and necessary information;

(7) Other cause which in the opinion of the Supervising Professional entitles the Contractor to an extension of time.

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

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

Section 15 - Claims for Extra Cost

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

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

(1) The Contractor shall be reimbursed for all reasonable costs incurred in doing the work, and shall receive an additional payment of 15% of all the reasonable costs to cover both its indirect overhead costs and profit;

(2) The term "Cost" shall cover all payroll charges for employees and supervision required under the specific order, together with all worker's compensation, Social Security, pension and retirement allowances and social insurance, or other regular payroll charges on same; the cost of all material and supplies required of either temporary or permanent character;

rental of all power-driven equipment at agreed upon rates, together with cost of fuel and supply charges for the equipment; and any costs incurred by the Contractor as a direct result of executing the order, if approved by the Supervising Professional;

(3) If the extra is performed under subcontract, the subcontractor shall be allowed to compute its charges as described above. The Contractor shall be permitted to add an additional charge of 5% percent to that of the subcontractor for the Contractor's supervision and contractual responsibility;

(4) The quantities and items of work done each day shall be submitted to the Supervising Professional in a satisfactory form on the succeeding day, and shall be approved by the Supervising Professional and the Contractor or adjusted at once;

(5) Payments of all charges for work under this Section in any one month shall be made along with normal progress payments. Retainage shall be in accordance with Progress Payments-Section 16.

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

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

Section 16 - Progress Payments

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

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

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

date of delivery of all of the equipment to be furnished; and payment of the final 10% on final completion of erection, testing and acceptance of all the equipment to be furnished; but not later than 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

(1) The Contractor shall procure and maintain during the life of this Contract, including the guarantee period and during any warranty work, such insurance policies, including those set forth below, as will protect itself and the City from all claims for bodily injuries, death or property damage which may arise under this Contract; whether the act(s) or omission(s)

giving rise to the claim were made by the Contractor or by any subcontractor or anyone employed by them directly or indirectly. In the case of all contracts involving on-site work, the Contractor shall provide to the City, before the commencement of any work under this contract, certificates of insurance and other documentation satisfactory to the City demonstrating it has obtained the policies and endorsements required, on behalf of itself, and when requested, any subcontractor(s). The certificates of insurance endorsements and/or copies of policy language shall document that the Contractor satisfies the following minimum requirements.

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

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

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

$1,000,000	Each occurrence as respect Bodily Injury Liability or Property Damage Liability, or both combined.
$2,000,000	Per Job General Aggregate
$1,000,000	Personal and Advertising Injury
$2,000,000	Products and Completed Operations Aggregate

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

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

(2) Insurance required under subsection (1)(b) and (1)(c) above shall be considered primary as respects any other valid or collectible insurance that the City may possess, including any self-insured retentions the City may have; and any other insurance the City does possess shall be considered excess insurance only and shall not be required to contribute with this insurance. Further, the Contractor agrees to waive any right of recovery by its insurer against the City.

(3) Insurance companies and policy forms are subject to approval of the City Attorney, which approval shall not be unreasonably withheld. Documentation must provide and

demonstrate an unconditional 30 day written notice of cancellation in favor of the City of Ann Arbor. Further, the documentation must explicitly state the following: (a) the policy number; name of insurance company; name and address of the agent or authorized representative; name and address of insured; project name; policy expiration date; and specific coverage amounts; (b) any deductibles or self-insured retentions which shall be approved by the City, in its sole discretion; (c) that the policy conforms to the requirements specified Contractor shall furnish the City with satisfactory certificates of insurance and endorsements prior to commencement of any work. Upon request, the Contractor shall provide within 30 days a copy of the policy(ies) to the City. If any of the above coverages expire by their terms during the term of this Contract, the Contractor shall deliver proof of renewal and/or new policies and endorsements to the Administering Service Area/Unit at least ten days prior to the expiration date.

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

(5) City reserves the right to require additional coverage and/or coverage amounts as may be included from time to time in the Detailed Specifications for the Project.

(6) The provisions of General Condition 28 shall survive the expiration or earlier termination of this contract for any reason.

Section 29 - Surety Bonds

Bonds will be required from the successful bidder as follows:

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

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

Section 30 - Damage Claims

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

Section 31 - Refusal to Obey Instructions

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

Section 32 - Assignment

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

Section 33 - Rights of Various Interests

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

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

Section 34 - Subcontracts

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

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

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

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

Section 35 - Supervising Professional's Status

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

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

Section 36 - Supervising Professional's Decisions

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

Section 37 - Storing Materials and Supplies

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

Section 38 - Lands for Work

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

Section 39 - Cleaning Up

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

Section 40 - Salvage

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

Section 41 - Night, Saturday or Sunday Work

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

Section 42 - Sales Taxes

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

Section 43

CONTRACTOR'S DECLARATION

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

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

_____ _____
Contractor Date

By _____
(Signature)

Its _____
(Title of Office)

Past due invoices, if any, are listed below.

Section 44

CONTRACTOR'S AFFIDAVIT

The undersigned Contractor,_____, represents that on _____, 20___, it was awarded a contract by the City of Ann Arbor, Michigan to_____ under the terms and conditions of a Contract titled _____. 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 Bid. All work under this Contract which is not included in these Standard Specifications, or which is performed using modifications to these Standard Specifications, shall be performed in accordance with the Detailed Specifications included in these contract documents.

Standard Specifications are available online:
http://www.a2gov.org/departments/engineering/Pages/Engineering-and-Contractor-Resources.aspx

DETAILED SPECIFICATIONS

CONTENTS – DETAILED SPECIFICATIONS

SECTION 01 11 00 - SUMMARY OF WORK

PART 1 - GENERAL

1.01 SUMMARY

A. The Project is located at the City of Ann Arbor Water Treatment Plant, 919 Sunset Road, Ann Arbor, MI and the facility's lime residual lagoon located approximately 2,000 feet to the west.

B. The Work consists of the modification of the existing Water Treatment Plant parking lot and two existing force man manholes, one at the WTP and one at the municipal lime residual lagoon site to accommodate Work being performed under Contract No. 2.

1.02 MDOT SPECIFICATIONS AND STANDARD PLANS

A. The Work included in this Contract shall be performed in accordance with the Michigan Department of Transportation 2012 Standard Specifications for Construction (hereafter referred to as MDOT Specifications) except as specifically modified herein. Technical specifications for materials, measurement of quantities and payment thereof, and methods of construction shall all be in accordance with the MDOT Specifications except as specifically modified by Special Provisions or other Contract Documents.

B. Where called for on Drawings or in Special Provisions, the Work shall be constructed in conformance with the Michigan Department of Transportation Standard Plans (hereinafter referred to as MDOT Standard Plans).

1.03 CITY SPECIFICATIONS AND STANDARD PLANS

A. Where called for on Drawings or in Specifications, the Work shall be constructed in conformance with the City of Ann Arbor Orange Book Specifications.

1.04 DIVISIONS OF THE WORK/DIVISION LIMITS

A. The work described above will be executed after the Lime Residual Lagoon Maintenance Project – Contract No. 1 as shown on the Drawings and described herein. Minimal overlap of Contracts No. 1 and No. 2 is possible, but not anticipated.:
   1. Contract No. 1 Work is described above.
   2. Contract No. 2 Work consists of the removal of lime residuals from the pond, hauling and disposal at off site locations. Processes to dewater and prepare the residuals for hauling and disposal will take place at both the Water Treatment Plant and the lagoon site.
   3. The Contract No. 1 work shall be substantially complete prior to the mobilization of the Contract No. 2 CONTRACTOR. All work in the parking lot, and work modifying and testing the forcemain must be completed.
   4. Anticipated Notice to Proceed dates, Contract Times, as well as liquidated damaged are outlined in Article III of the Contract.

B. At all Contract interfaces, Contractors awarded the various Contracts shall cooperate with other Contractors meeting at that point, and shall schedule work so that in no way shall the operations of one Contractor interfere with another. Delays created by situations involving two uncooperative Contractors shall be considered the fault of the dispute between the concerned parties and shall not be passed on as a cost to OWNER. Periodic meetings between Contract No. 1 and Contract No. 2 Contractors prior to commencement of construction for Contract 2 may be required.

C. The City will have a project underway at the WTP during this contract. The project is titled WTP Architectural and Structural Repairs and will include roof replacement and masonry repair throughout the WTP site.

1.05 WORK SEQUENCE

A. CONTRACTOR shall arrange its Work so that at no time shall it cause unnecessary interruption to the operation of existing facilities. CONTRACTOR shall prepare and submit to ENGINEER for approval, a complete detailed working schedule setting forth the sequence of operations CONTRACTOR proposes to follow.

1.06 CONTRACTOR USE OF PREMISES

A. Limit use of the premises to construction activities in areas indicated; allow for OWNER occupancy and use by the public. Confine operations to areas within Contract limits indicated. Portions of the Site beyond areas in which construction operations are indicated are not to be disturbed.

B. Keep driveways and entrances serving the premises clear and available to OWNER, OWNER's employees, and private property owners at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on Site. Areas for CONTRACTOR's trailers, equipment, and material storage, and CONTRACTOR's employee parking shall be as indicated on Drawings or agreed by OWNER prior to the start of construction.

1.07 OWNER OCCUPANCY

A. Full OWNER Occupancy: OWNER will occupy the Site and existing building during the entire construction period. Cooperate with OWNER during construction operations to minimize conflicts and facilitate OWNER usage. Perform the Work so as not to interfere with OWNER's operations.

1.08 LIQUIDATED DAMAGES

A. Liquidated damages will be applied independently for each area of improvements that are not completed by the dates set by this Contract.

1.09 CONFINED SPACE

A. The force main manholes and some locations on the water treatment plant site are considered Non-Permitted Confined Spaces. The CONTRACTOR must meet all requirements of MIOSHA for working in confined spaces. The CONTRACTOR must submit a confined space entry program to the City for record, before any work is started in the area.

1.10 SECURITY AND ACCESS

A. The City of Ann Arbor's water treatment plant and lime residual lagoon are limited access facilities. The CONTRACTOR must comply with the City's operational provisions for security including, but not limited to:
   1. Provide proper identification of employees.
   2. Provide and use photos IDs for all CONTRACTOR personnel.
   3. Maintain daily sign-in log of personnel and visitors.
   4. Provide a list of personnel and vehicles on site.
   5. Maintain a daily log of vehicle license plate numbers on site.
   6. Allow OWNER to conduct background checks on CONTRACTOR's personnel upon request.
   7. Notify the plant in advance of material deliveries to the site, including delivery contents.

   These procedures may be revised by the City at any time, as needed.

B. Use of OWNER's security measures does not relieve Contractor of its responsibility to secure its own working spaces and materials.

C. Access to Site, Roadways, and Parking Areas
   1. The CONTRACTOR shall be responsible for providing access to the construction area and for preparing and maintaining temporary access road, fence, and/or gate, as needed. CONTRACTOR's personnel shall park on approved City streets adjacent to water treatment plant and shall not park on the plant site. CONTRACTOR's personnel may park on the lagoon site.
   2. It shall be the responsibility of the CONTRACTOR to obtain any permits required from the 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.

1.11 GUARANTEE

A. The CONTRACTOR shall be present for a site inspection before the warranty expires. At this time, the OWNER will develop a punch list of deficiencies to be addressed by the CONTRACTOR. The CONTRACTOR shall address these items within 14 days of the inspection.

1.12 PERMITS

A. 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. Right of Way Permit – City of Ann Arbor
   2. Soil Erosion Control Permit - City of Ann Arbor
   3. City of Ann Arbor Building Permit

B. The City of Ann Arbor Building permit shall be applied for by the CONTRACTOR. The plan review fee shall be paid for by the CONTRACTOR. The CONTRACTOR shall be required to obtain the permit, pay all associated fees and adhere to all requirements of the permit. The CONTRACTOR must submit a copy of the permit to the OWNER and ENGINEER prior to construction.

C. CONTRACTOR may be required to obtain a permit from the City of Ann Arbor should any part of project mobilization or project activities interfere with traffic on a City street. CONTRACTOR must coordinate installation of no parking measures with the City Engineering Department.

D. The Soil Erosion Control Permit shall be applied for by the Contractor. The CONTRACTOR shall be required to obtain the permit, pay all associated fees and adhere to all requirements of the permit.

1.13 MISCELLANEOUS PROVISIONS

A. CONTRACTOR shall notify all Owners of public utilities within the right-of-way or easement for the purpose of establishing the approximate locations of the utilities in accordance with the requirements of Act No. 53 Public Acts of 1974 of the State of Michigan. CONTRACTOR shall notify MISS DIG-Utility Communication System, 1-800-482-7171 or 811, three working days prior to starting any excavation with power equipment.

B. CONTRACTOR shall be responsible for verifying the location of all underground utilities by magnetic or other type instruments before beginning excavation Work.

C. Time and Sequence of Work: In general, it is the intention and understanding that CONTRACTOR shall have control over the sequence or order of execution of the several parts of the Work to be done under the Contract and over the method of accomplishing the required results, except as some particular sequence or method may be distinctly demanded by the Drawings and Project Manual or by the expressed provisions of the Contract. ENGINEER may, however, make such reasonable requirements as may, in ENGINEER's judgment, be necessary for the proper and effective protection of Work partially or wholly completed, and to these requirements CONTRACTOR shall conform.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 CONTROL OF WATER POLLUTION

A. General Requirements
   1. The CONTRACTOR shall conduct his work in such manner as to prevent the entry of fuels, oils, bituminous materials, chemical, sewage or other harmful materials into the City's water supply or on to the soil.
   2. The CONTRACTOR shall take all necessary precautions to prevent the entry of these harmful materials including the use of tarps, planks, protective trusses or scaffolding systems, or other OWNER and ENGINEER approved methods.
   3. Any vehicles or equipment with oil, fuel, or other fluid leaks shall not be allowed on the site and shall be immediately removed upon detection.

4. The CONTRACTOR shall monitor provisions to reduce the spread of filtrate and all erosion control BMPs during pipeline flushing activities at the lagoon site. The existing storm water basin may be utilized as an area to flush, and CONTRACTOR will be responsible for a complete cleanup of all lime residuals and any repairs to the basin.

END OF SECTION

SECTION 01 21 00 - ALLOWANCES

PART 1 - GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements for processing Allowances. Selected materials and equipment, and in some cases their installation, are shown and specified in the Contract Documents by Allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. Additional requirements, if necessary, will be issued by Change Order.

1.02 DEFINITIONS

A. Provisionary Allowance: A monetary sum that, as part of the Contract Price, is to be utilized as directed by OWNER, through a Change Order, to cover minor changes in the Work.

1.03 SUBMITTALS

A. Submit invoices or delivery slips to indicate actual quantities of materials delivered to the Site for use in fulfillment of each Allowance.

1.04 OWNER'S INSTRUCTIONS

A. At the earliest feasible date during the contract, advise ENGINEER of the date when the final selection and purchase of necessary materials described by an Allowance must be completed in order to avoid delay in performance of the Work.

B. Purchase products to meet specifications of the Owner.

C. Use Allowances only as directed for OWNER's purposes, and only by Change Orders which designate amounts to be charged to the Allowance.

D. 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 Paragraph 11.02 of the General Conditions.

E. Change Orders authorizing use of funds from the Provisionary Allowances will include CONTRACTOR's related costs and reasonable overhead and profit margins.

F. At Project closeout, any amounts remaining in Allowances will be credited to OWNER by Change Order.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 INSPECTION

A. Inspect products covered by an Allowance promptly upon delivery for damage or defects.

3.02 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.

SCHEDULE OF ALLOWANCES

1. Lump Sum Allowance for Existing Force Main Repairs. An Allowance of $30,000 shall be included in the Contract Price for this Work. Should the pressure testing of the existing force main reveal there is unacceptable leakage of the existing force main pipe installed under previous contract, CONTRACTOR shall provide the equipment, labor and materials to perform additional testing designed to isolate the location of the leakage, and to ultimately make the repair to the line so that it passes the test. Work shall be recorded on a time and materials basis, with amounts tracked so that costs do not exceed the amount of the Allowance. Contractor is responsible for informing the ENGINEER if the defects found in the existing line cannot be repaired using the funds allotted in this Allowance prior to beginning actual repair work on the force main. For further information, contact:

Name	Joseph Siwek
Company	Tetra Tech
Address	710 Avis Drive, Ann Arbor, MI 48108
Phone	734-213-4052

2. Lump Sum Allowance for Utility Relocation. For the permanent relocation of any existing utilities, including WTP yard piping, which are in conflict with the proposed work and need to be relocated rather than built around, an Allowance of $10,000 shall be included in the Contract Price for this Work. This allowance includes time, materials, installation and labor costs associated with relocating the existing utility piping, CONTRACTOR is responsible for all contact and correspondence with the Owner of utility to complete the relocation. For further information, contact:

Name	Joseph Siwek
Company	Tetra Tech
Address	710 Avis Drive, Ann Arbor, MI 48108
Phone	734-213-4052

3. Lump Sum Allowance for Streetlight Relocation. For the permanent relocation of an existing street light and pole, an Allowance of $10,000 shall be included in the Contract Price for this Work. This allowance includes time, materials, installation and labor costs associated with relocating the existing utility, CONTRACTOR is responsible for all contact and correspondence with the Owner of utility to complete the relocation. For further information, contact:

   Detroit Edison – 800-548-4655

END OF SECTION

SECTION 01 27 00 - MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: This Section specifies administrative and procedural requirements for measurement and payment. Payment for Work under this Contract will be made on a unit price or lump sum basis for Work actually completed. Final measurements of the Work will be taken by ENGINEER to determine the amount of Work completed. The method of applying the unit prices to measured quantities shall be as specified in this Section.

1.02 MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT)

A. Where items of Work are identified with MDOT pay item codes on Bid Form, measurement and payment for these items shall be in accordance with Section 1.09.01 of the MDOT 2012 Standard Specifications for Construction, and as specified herein.

B. Refer to individual MDOT Standard Specifications, Special Provisions, and Supplemental Specifications for information on procedures on how the Work will be measured and paid for, and detailed requirements for the Work described under each unit price.

1.03 DEFINITIONS

A. Average End Area: Average end area shall be the cross-sectional area determined perpendicular to the long axis of work being measured (the end area). End areas shall be determined within 50 feet of each end of the Work and in no more than 100-foot intervals. Total volume shall be determined by multiplying each end area by the length of Work to which it applies.

B. Actual Area, for Square Yard and Square Foot Measurements: For rectangular or trapezoidal areas, the average width multiplied by the length. Irregularly shaped areas shall be broken into roughly rectangular or triangular shapes for measurement.

C. Field Survey: For large areas to be measured for the above two methods, ENGINEER may elect to have the area determined by field survey using electronic data collection, and the area determined based on a plot of the data. CONTRACTOR will be provided with a copy of the plot and survey data.

D. Truck Load Tickets: For unit price items paid by the ton, scales used must be currently certified by MDOT for use on State Project. CONTRACTOR shall provide ENGINEER with copies of certification. Load tickets must show date, time, material, load weight, tare weight, and net weight, and be mechanically or computer printed. Handwritten tickets shall not be accepted.

1.04 OWNER'S INSTRUCTIONS

A. Payment will only be made for items listed on Bid Form. The costs for other Work required for a complete Project will be included in the prices Bid for the other items of Work listed on Bid Form.

B. Payment for each item will be in accordance with Paragraph 11.03 of the General Conditions, and include all applicable labor, material, equipment, and ancillary items to complete the Work specified.

C. All measurements shall be rounded to the nearest whole unit.

1.05 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by ENGINEER and paid for by OWNER.

B. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.

C. The date for each progress payment will be determined at the Pre-Construction Conference. The period of construction Work covered by each Application for Payment is 1 month. Actual start/end dates will be determined at the Pre-Construction Conference.

D. Use the AIA (American Institute of Architects) Application and Certification for Payment form for Applications for Payment.
   1. Complete every entry on the form, including execution by person authorized to sign legal documents on behalf of CONTRACTOR.
   2. Incomplete applications will be returned without action.

E. Initial Application for Payment: 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. CONTRACTOR's Construction Schedule (preliminary if not final).

F. Application for Payment at Substantial Completion: Administrative actions and submittals that shall proceed or coincide with this application include:
   1. Warranties (guarantees) and maintenance agreements.
   2. Maintenance instructions.
   3. Meter readings.
   4. Application for reduction of retainage, and consent of surety.
   5. Advice on shifting insurance coverages.
   6. List of incomplete Work, recognized as exceptions to ENGINEER's Certificate of Substantial Completion.

G. Final Payment Application: 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. Transmittal of required Project construction records to OWNER.
   6. Proof that taxes, fees, and similar obligations have been paid.
   7. Removal of temporary facilities and services.
   8. Removal of surplus materials, rubbish, and similar elements.
   9. CONTRACTOR's waivers of liens for Project.
   10. Consent of Surety for final payment.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

SCHEDULE OF UNIT PRICES

DIVISION 1 - GENERAL REQUIREMENTS

Description: General Conditions, Max $15,000
Payment: Lump Sum.
Measurement: Each.
Work Required: This item of work will be paid for on a pro rata basis at the time of each progress payment. Measurement will be based on the ratio between work completed during the payment period and the total contract amount. When all of the work of this Contract has been completed, the measurement of this item shall be 1.0 Lump Sum, minus any deductions incurred for inadequate performance as described herein. This amount will not be increased for any reason, including extensions of time, extras, and/or additional work.

The unit price for this item of work shall include all labor, material, and equipment costs to transport equipment to site, obtain Contractor's bonds, insurance and any permits, complete all site prepatory work, ENGINEER's trailer, temporary facilities and all other operations and related work needed to begin work perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

Description: Allowances
Payment: Lump Sum.
Measurement: Each.
Work Required: As specified in Section 01 21 00 - Allowances.

Description: Minor Traffic Control
Payment: Lump Sum.
Measurement: Each.
Work Required: Implementation and maintenance of the traffic control measures as noted in the construction plans. Includes providing, placing, moving, operating, and maintaining the necessary barricades, signs, and devices for the life of Project for all lane closures, vehicular and pedestrian detours, temporary parking closures and other specific provisions as listed on the drawings as well as removing barricades, signs, and devices when the Work is complete.

Description: Audiovisual Coverage
Payment: Lump Sum.
Measurement: Each.
Work Required: As specified under Section 01 32 00 - Audiovisual Coverage.

Description: Force Main Performance Testing
Payment: Lump Sum.
Measurement: Each.
Work Required: As specified under Section 15 10 00 – Pressure Process Piping. Includes all equipment, materials and labor to swab/pig, flush and pressure test the modified existing force main.

Description: WTP Site Modifications
Payment: Lump Sum.
Measurement: Each.
Work Required: Includes all equipment, materials and labor to construct the WTP site modifications as shown in the details in the construction drawings, including all excavation, dewatering, structure taps, concrete, pipe fittings and plugs including those not shown specifically on the drawings as required to avoid utility conflicts, bollards, backfilling, restoration, and other Work required for a complete job.

Description: Lagoon Site Modifications
Payment: Lump Sum.
Measurement: Each.
Work Required: Includes all equipment, materials and labor to construct the Lagoon site modifications as shown in the details in the construction drawings, including all excavation, dewatering, structure taps, concrete, pipe fittings and plugs, bollards, backfilling, rip rap, restoration, and other Work required for a complete job.

Description: Soil Erosion and Sedimentation Control Plan
Payment: Lump Sum.
Measurement: Each.
Work Required: Includes all labor equipment and materials to complete and submit for approval a detailed Soil Erosion and Sedimentation Control plan from the City of Ann Arbor based on the planned operations of the selected methods for completing the project utilizing the provided construction site plan as a basis. Includes maintenance and periodic inspection and reporting for all BMPs throughout the course of the project.

Description: Tree Relocation
Payment: Each.
Measurement: Per each tree relocated.
Work Required: Includes all labor, materials, and equipment needed to accomplish this work. No additional payment will be made for coordination with City of Ann Arbor. No additional payment will be made for repair or replacement of vegetation damaged by contractor during relocation efforts.

Description: Protective Fencing
Payment: Per linear foot.
Measurement: As measured along the length of protective fencing used.
Work Required: Includes all labor, materials, and equipment needed to accomplish this work. No additional payment will be made for maintenance or reinstallation of fence during the construction period. No additional payment will be made for repair or replacement of vegetation damaged by contractor during installation and maintenance of fencing.

Description: Fence
Payment: Per linear foot.
Measurement: Along fence to outside edges of posts, for the types and sizes listed on Bid Form.
Work Required: Includes all labor, materials, and equipment needed to accomplish this work. Fence, concrete for bases, barbed wire if required.

Description: Gate
Payment: Each.
Measurement: Each vehicular fence gate, for the types and sizes listed on Bid Form.
Work Required: Includes all labor, materials, and equipment needed to accomplish this work. Fence panels, support and guide poles, rails, concrete for bases, hatch and locking mechanism and barbed wire if required.

Description: Pavement Markings
Payment: Lump Sum.
Measurement: Each.
Work Required: Includes all labor, materials, and equipment needed to accomplish this work. Preparation of pavement, layout and placement of all pavement markings to match the existing parking lot marking including the proposed pavement markings as shown in the construction drawings.

Description: Closeout
Payment: Lump Sum.
Measurement: Each.
Work Required: Removal of equipment from Site, removal of temporary facilities, and completion of all restoration.

Description: Certified Payroll Compliance and Reporting
Payment: Lump Sum.
Measurement: Each.
Work Required: The unit price for this item of work shall include all supervisory, accounting, administrative, and equipment costs needed to monitor and perform all work related to maintaining compliance with the tasks specified in this Detailed Specification, the City of Ann Arbor Code of Ordinances, its Prevailing Wage Compliance policy and the applicable Federal and State laws.

Payment for this work will be made with each progress payment, on a pro-rata basis, based on the percentage of construction completed. When all of the work of this contract has been completed, the measurement of this item shall be 1.0 times the Lump Sum bid amount. This amount will not be increased for any reason, including extensions of time, extra work, and/or adjustments to existing items of work.

END OF SECTION

SECTION 01 29 00 - APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements governing CONTRACTOR's Applications for Payment.

B. Related Sections:
   1. CONTRACTOR's Schedule of Unit Prices is included in Section 01 27 00.
   2. CONTRACTOR's Construction Schedule and Submittal Schedule are included in Section 01 33 00.

1.02 OWNER'S INSTRUCTIONS

A. Schedule of Values:
   1. Coordinate preparation of Schedule of Values with preparation of CONTRACTOR's Construction Schedule.
   2. Correlate line items on Schedule of Values with other required administrative schedules and forms, including:
      a. CONTRACTOR's Construction Schedule.
      b. Application for Payment form.
      c. List of subcontractors.
      d. Schedule of Allowances.
      e. Schedule of Alternates.
      f. List of products.
      g. List of principal suppliers and fabricators.
      h. Schedule of Submittals.
   3. Submit Schedule of Values to ENGINEER at the earliest feasible date, but in no case later than 7 days before the date scheduled for submittal of the initial Application for Payment.
   4. Format and Content: Use the Project Manual Table of Contents as a guide to establish the format for Schedule of Values.
   5. Identification: Include the following Project identification on Schedule of Values:
      a. Project name and location.
      b. Name of ENGINEER.
      c. Project number.
      d. CONTRACTOR's name and address.
      e. Date of submittal.
   6. Arrange Schedule of Values in a tabular form with separate rows for each Specification Section and separate columns for each major structure or area of Work.
   7. Provide a breakdown of the Contract Price in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Break principal subcontract amounts down into several line items.
   8. Round off amounts to the nearest whole dollar; the total shall equal the Contract Price.
   9. For each part of the Work where an Application for Payment may include materials or 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.

10. Show line items for indirect costs, and margins on actual costs, only to the extent that such items will be listed individually on Applications for Payment. Each item on Schedule of Values and Applications for Payment shall be complete including its total cost and proportionate share of general overhead and profit margin.
11. At CONTRACTOR's option, temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items on Schedule of Values or distributed as general overhead expense.
12. Update and resubmit Schedule of Values when Change Orders or Work Change Directives result in a change in the Contract Price.
13. A Lump Sum payment equal to 1-1/2% of the total Bid Price (to include all bonds, insurance, etc.) will be allowed for "mobilization" as a progress payment line item. The actual cost of bonds and insurance (up to maximum payment of 1-1/2%) will be considered in the initial payment request provided that cost documentation suitable to the OWNER is furnished by the CONTRACTOR. Any outstanding balance of the mobilization line litem will be payable when the Project work is 10% complete as indicated by the approved progress payments (less costs of mobilization and stored equipment).
14. Schedule of Values should reserve no less than 5% of lump sum cost to close out Work.

B. Initial Application for Payment: 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 if not final).
   5. Schedule of principal products.
   6. Submittal Schedule (preliminary if not final).

C. Applications For Payment:
   1. Each Application for Payment shall be consistent with previous applications and payments as certified by ENGINEER and paid for by OWNER.
   2. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.
   3. The date for each progress payment will be determined at the Pre-Construction Conference. The period of construction Work covered by each Application for Payment is 1 month. Actual start/end dates will be determined at the Pre-Construction Conference.
   4. Use the AIA (American Institute of Architects) Application and Certification for Payment form for Applications for Payment.
   5. Complete every entry on the form, including execution by person authorized to sign legal documents on behalf of CONTRACTOR. Incomplete applications will be returned without action.
   6. Entries shall match data on Schedule of Values and CONTRACTOR's Construction Schedule. Use updated Schedules if revisions have been made.
   7. Include amounts of Change Orders and Work Change Directives issued prior to the last day of the construction period covered by the application.
   8. Submit 3 executed copies of each Application for Payment to ENGINEER; Each copy shall be complete, including waivers of lien and similar attachments, when required.
   9. Transmit each copy with a transmittal form listing attachments, and recording appropriate information related to the application in a manner acceptable to ENGINEER.

D. Application for Payment at Substantial Completion:
   1. Following issuance of the Certificate of Substantial Completion, submit an Application for Payment; this application shall reflect any Certificates of Partial Substantial Completion issued previously for OWNER occupancy of designated portions of the Work.
   2. Administrative actions and submittals that shall proceed or coincide with this application include:
      a. Warranties (guarantees) and maintenance agreements.
      b. Maintenance instructions.
      c. Final cleaning.
      d. Application for reduction of retainage and consent of surety.
      e. Final progress photographs.
      f. List of incomplete Work, recognized as exceptions to ENGINEER'S Certificate of Substantial Completion.

E. Final Payment Application: 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. Transmittal of required Project construction records to OWNER.
   4. Proof that taxes, fees, and similar obligations have been paid.
   5. Removal of temporary facilities and services.
   6. Removal of surplus materials, rubbish, and similar elements.
   7. CONTRACTOR's waivers of mechanics liens for Project.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01 31 00 - PROJECT COORDINATION

PART 1 - GENERAL

1.01 SUMMARY

A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:
   1. Scheduling
      a. Coordination of Work under this Contract.
      b. Administrative and supervisory personnel.
   2. Land survey work.
   3. Pre-Construction Conference.
   4. Progress meetings.
   5. General installation provisions.
   6. Cleaning and protection.

B. Related Sections Specified Elsewhere:
   1. Division of Work and specific construction milestones in Section 01 11 00.
   2. Requirements for CONTRACTOR's Construction Schedule are included in Section 01 33 00.

1.02 DEFINITIONS

A. Monument: The term "monument" shall be considered as any object defining the location of a property corner, street location, section line, fractional section line, right-of-way marker, or other delineation of land ownership or division.

1.03 SUBMITTALS

A. Within 15 days of Notice to Proceed, submit a list of CONTRACTOR's principal staff assignments, including the Superintendent and other personnel in attendance at Site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.

1.04 SCHEDULING

A. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair. Make adequate provisions to accommodate items scheduled for later installation.

B. CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at Site in accordance with Laws or Regulations. CONTRACTOR shall train CONTRACTOR's employees on use of these sheets and shall keep a master copy on hand at Site.

C. Coordination with Other Contractors:
   1. CONTRACTOR shall so conduct CONTRACTOR's operations as not to interfere with or injure the Work of other Contractors or workmen employed on adjoining or related Work, and CONTRACTOR shall promptly make good any injury or damage which may be done to such Work by CONTRACTOR or CONTRACTOR's employees or agents.
   2. Should a contract for adjoining Work be awarded to another CONTRACTOR, and should the Work on one of these contracts interfere with that of the other, ENGINEER shall decide which contract shall cease Work for the time being and which shall continue, or whether Work on both contracts shall continue at the same time and in what manner.

D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of schedules.
   2. Installation and removal of temporary facilities.
   3. Delivery and processing of submittals.
   4. Progress meetings.
   5. Project closeout activities.

1.05 PRE-CONSTRUCTION CONFERENCE

A. ENGINEER will schedule a Pre-Construction Conference and organizational meeting at the Site or other convenient location prior to commencement of construction activities to review responsibilities and personnel assignments.

B. Attendees: OWNER, ENGINEER and ENGINEER's consultants, CONTRACTOR and its superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the Work.

C. Agenda: Discuss items of significance that could affect progress including such topics as:
   1. Tentative Construction Schedule.
   2. Critical Work sequencing.
   3. Designation of responsible personnel.
   4. Procedures for processing field decisions and Change Orders.
   5. Procedures for processing Applications for Payment.
   6. Distribution of Contract Documents.
   7. Submittal of Shop Drawings, product data, and samples.
   8. Preparation of Record Documents.
   9. Use of the premises.
   10. Office, Work, and storage areas.
   11. Equipment deliveries and priorities.
   12. Safety procedures.
   13. First aid.
   14. Security.
   15. Housekeeping.
   16. Working hours.

1.06 PROGRESS MEETINGS

A. Attendees: In addition to representatives of OWNER and ENGINEER, each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings by persons familiar with the Project and authorized to conclude matters relating to progress.

B. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the Project.

C. CONTRACTOR's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to CONTRACTOR's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

D. Reporting: ENGINEER will prepare and distribute copies of minutes of the meeting to each party present and to other parties who should have been present. The minutes will include a brief summary, in narrative form, of progress since the previous meeting and report.

E. Schedule Updating: CONTRACTOR shall revise Construction Schedule after each progress meeting where revisions to Schedule have been made or recognized. Issue revised Schedule no later than 3 days after the progress meeting date to ENGINEER for distribution concurrently with the progress meeting minutes.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 LAND SURVEY WORK

A. ENGINEER will:
   1. Identify existing control points and property line corner stakes and will furnish one set of suitable base lines and reference elevations for various parts of the Work to be maintained and preserved by CONTRACTOR.
   2. Structures: Establish a minimum of 2 permanent benchmarks on Site, referenced to data established by survey control points.
   3. Sewers and Water Mains: Establish a minimum of 2 permanent benchmarks on Site, referenced to data established by survey control points. Additional benchmarks will be placed on Site if these permanent benchmarks cannot be referenced from other areas of the Work.

B. Monuments:
   1. During the progress of Work, CONTRACTOR may encounter monuments within CONTRACTOR's working area. A minimum number of such points have been located by ENGINEER prior to construction to provide control for the preparation of construction Drawings, and these are noted on Drawings.
   2. All probable monument points, as so far as known, have been indicated on Drawings as property, street, and/or section line intersection points.
   3. CONTRACTOR, prior to actual construction, shall erect protective barricades around all ascertained monuments that are in or adjacent to the construction area. Any other monument uncovered or located during progress of the Work shall be protected from damage or loss and ENGINEER shall be notified in writing as to the exact location.
   4. During the normal course of Work, monuments may require removal. CONTRACTOR shall not remove any such monument until ENGINEER shall have set 4 iron pipe stakes each 2 feet long as reference points, or located by reference traverse, all such monuments for the resetting of such monuments. Reference stakes shall be located in such positions and barricaded so that they will not be disturbed by any construction operations. CONTRACTOR shall furnish the necessary iron pipe stakes, barricades, necessary labor, and other assistance required by ENGINEER for ENGINEER's Work in setting the reference stakes. After this referencing has been done and permanent sketches prepared, ENGINEER will give permission to CONTRACTOR for the removal of the monument. Referenced monuments will be reset by OWNER after all backfilling has fully settled.
   5. Any monuments damaged or destroyed by CONTRACTOR that are not within the normal Work area as determined by ENGINEER shall be replaced, and CONTRACTOR shall pay all costs of the replacement survey. The replacement survey shall be performed by, or under, the direct supervision of a Registered Land Surveyor, licensed in the State in which the Work is performed.

C. CONTRACTOR Performance:
   1. Furnish stakes and such suitable labor and assistance as ENGINEER may require in setting survey work.
   2. Be responsible for costs by ENGINEER for providing:
      a. Additional or replacement staking of original control points established by ENGINEER.
      b. Replacements of Site benchmarks established by ENGINEER.
   3. Verify layout information shown on Drawings, in relation to the property survey and existing benchmarks before proceeding to layout the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.
      a. Record benchmark locations, with horizontal and vertical data, on Contract Record Documents.
   4. Working from lines and levels established by ENGINEER, establish benchmarks and markers to set lines and levels at each area of Work and elsewhere as needed to properly locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.
   5. Benchmarks or control points shall not be changed or relocated without prior written approval by ENGINEER. Promptly report lost or destroyed reference points, or requirements to relocate reference points because of necessary changes in grades or locations.
   6. Promptly replace lost or destroyed Project control points. Base replacements on the original survey control points.

7. Advise entities engaged in construction activities, of marked lines and levels provided for their use.
8. As construction proceeds, check every major element for line, level and plumb.
9. Site Improvements: Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes, and invert elevations by instrumentation and similar appropriate means.
10. Building Lines and Levels: Locate and lay out batter boards for structures, building foundations, column grids and locations, floor levels, and control lines and levels required for mechanical and electrical Work.
11. Existing Utilities and Equipment:
    a. The existence and location of underground and other utilities and construction as shown on Drawings as existing are not guaranteed. Before beginning Site Work, CONTRACTOR shall investigate and verify the existence and location of underground utilities and other construction.
    b. Furnish information necessary to adjust, move, or relocate existing structures, utility poles, lines, services, or other appurtenances located in or affected by construction. Coordinate with local authorities having jurisdiction.
    c. Prior to construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water service piping.

3.02 CLEANING AND PROTECTION

A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

END OF SECTION

SECTION 01 31 50 – GENERAL CONDITIONS

PART 1 - GENERAL

1.01 SUMMARY

A. This Section specifies all work described and required by the Plans and Specifications at each location for which no item of work is listed in the Bid Form, including but not limited to:

1. Coordination of, and cooperation with, other contractors, agencies, departments, and utilities.
2. Protection and maintenance of utilities.
3. Placing, maintaining, and removing all soil erosion and sedimentation controls, including stone inlets filers (as shown on project plants).
4. Maintaining drainage.
5. Maintaining driveways drive openings, sidewalks, bike paths, mail deliveries, and solid waste/recycle pick-ups. This includes coordination of hose piping and temporary ramps.
6. Storing all materials and equipment off lawn areas.
7. Site clean-up.
8. Furnishing and operating vacuum-type utility structure cleaning equipment
9. Noise and dust control
10. Mobilization(s) and demobilization(s).
11. All miscellaneous and incidental items such as overhead, insurance, and permits.
12. Meeting all requirements relating to Debarment Certification, Davis Bacon Act, and Disadvantaged Business Enterprise, and providing the necessary documentation.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01 32 00 - AUDIOVISUAL COVERAGE

PART 1 - GENERAL

1.01 SUMMARY

A. CONTRACTOR shall provide to OWNER a complete color audiovisual record of Site for the purpose of establishing a record of conditions prior to construction. The audio-video recording shall be of a professional quality that will clearly provide an accurate visual description of existing conditions. The record shall include all audio-video deliverables, deliverable storage cases, index labels, and run sheet logs.

1.02 SUBMITTALS

A. Provide 2 copies of the audiovisual record as specified in this Section. Submit deliverables in accordance with Section 01 33 00. The original deliverable shall be retained by CONTRACTOR and maintained in a safe environment in case additional copies of the record are required.

PART 2 - PRODUCTS

2.01 AUDIO-VIDEO DELIVERABLE

A. Videos shall be mastered on high-quality formats only. High-quality formats acceptable are digital hard drive and DVD. Deliver premium quality DVDs or hard drives to ENGINEER.

PART 3 - EXECUTION

3.01 ACCEPTABLE VIDEOTAPING FIRMS

A. Services shall be performed by one of the following organizations:
   1. Construction Video (586) 752-2580
   2. Kuiper Productions (906) 297-8002

3.02 SCHEDULE

A. Video recording shall take place prior to construction and prior to the placement of equipment and material when possible. The video must be recorded during a time of good visibility. No recording shall be done during precipitation or when the surfaces are covered with more than 5 percent snow, leaves, or temporary debris unless authorized by ENGINEER.

B. When video recording on private property, CONTRACTOR shall give the property owners sufficient notice of such entry so that the owners may be advised of and their permission obtained for the Work. Refusal of entry shall be noted on the logsheet.

3.03 COVERAGE

A. The video coverage must include all surface features within the construction zone of influence. Surface features shall include but not be limited to roadways, cross streets, driveways, sidewalks, curbs, ditches, culverts, headwalls, retaining walls, landscaping, trees, shrubbery, fences, or other structures located within the construction zone. Where construction may necessitate a local detour of traffic, additional panning of the full highway right-of-way will be required. It will not be necessary to cover side street detours, only areas within the full highway right-of-way of the street along which the construction is being done. OWNER shall have the authority to designate what area may be omitted or added for audio-video coverage.

B. Where conventional wheeled vehicle is used, the camera shall be securely mounted to provide steady viewing. The camera lens shall be at a level to facilitate best perspective and line of sight. The vehicle shall be plainly marked with company name and telephone number. Caution signs, flags, and strobes may be used for safety.

C. The vehicle rate of travel shall be proportional to the number, size and value of the surface features within the construction zone of influence. The following shall be used as a guide for maximum rates of travel:

Area Type	Typical Characterization	Average Feet per Minute
High-Density	Hard surface streets, curbs, drives and sidewalks; 50-foot lots; few empty lots	48
Medium-Density	Gravel roads, hard and soft surface drives, no sidewalks, culverts and headwalls, 100-foot lots, few empty lots	60
Low-Density	Gravel roads, small fields or woods, occasional buildings	90
Extra Low-Density	Gravel roads, large fields, sparse buildings	120

D. Vehicle rates of travel on road surface view only or haul routes shall be approximately 5 miles per hour.

E. Panning rates and zoom-in zoom-out rates shall be controlled sufficiently so that playback will produce clarity of the object viewed, and locations must be identified by audio and video means at intervals of not more than 100 lineal feet.

F. The recording must be continuous and where sound and video information can be recorded. Accompanying the video shall be a corresponding, simultaneously recorded audio track containing the commentary of the camera operator. The commentary shall provide orientation for the viewer, identification of surface features, and description of points of interest being recorded visually.

G. To preclude the possibility of tampering or editing in any manner, all video recordings must be made by electronic means and display continuously and simultaneously generated transparent digital information to include the date and time of recording, as well as the corresponding engineering stationing numbers. The date information will contain the month, day, and year (for example, 4/1/01), placed directly below the time information. The time information shall consist of hours, minutes, and seconds, separated by colons (for example 10:35:18).

H. The engineering stationing numbers must be accurate, must correspond to the project stationing if provided, and must include the standard engineering symbols (for example, 14+18). If there is no engineering stationing, each street shall be stationed individually starting at 0+00.

I. Below the engineering stationing, periodic transparent alphanumeric information shall appear. This information will consist of the name of the project, name of area covered, direction of travel, viewing side, etc.

J. Global Positioning System may be used with or in place of stationing as directed by ENGINEER.

K. When video coverage is required in areas not accessible by conventional wheeled vehicle, the coverage shall be executed by walking or special conveyance approved by ENGINEER.

3.04 NONELECTRONIC RECORD

A. A runsheet log shall be provided that accurately catalogs the contents of each video. Information contained in runsheet will include:
   1. Street name, easement designation, or address.
   2. Sheet number or numbers relative to line entry of a particular area of coverage.
   3. Roll numbers.
   4. Real-time code indexing for each project segment indicating hours, minutes, and seconds.
   5. Direction of travel for each segment.
   6. Viewing side for each segment.
   7. Starting and ending points for each segment.
   8. Project information such as Project title, Owner, date.

B. Videos shall be labeled with appropriate project information and shall be able to be cross-referenced with runsheets. Information on labels shall include roll number, Project title, Project location, date, particular set (if multiple copies), and a quick reference list of tape contents.

END OF SECTION

SECTION 01 33 00 - SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements for submittals, including, but not necessarily limited to, the following:
   1. CONTRACTOR's Construction Schedule.
   2. Submittal Schedule.
   3. Shop Drawings.
   4. Product data.

B. Topics covered elsewhere include, but are not limited to:
   1. Permits.
   2. Applications for payment.
   3. Performance and payment bonds.
   4. Insurance certificates.
   5. List of subcontractors.

1.02 SUBMITTALS

A. Bonds and Insurance Certificates shall be submitted to and approved by OWNER and ENGINEER prior to the initiation of any construction on Site.

B. Permits, Licenses, and Certificates: For OWNER's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents; correspondence and records established in conjunction with compliance with standards; and regulations bearing upon performance of the Work.

1.03 SUBMITTAL PROCEDURES

A. Coordination:
   1. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
   2. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
   3. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
   4. ENGINEER reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

B. Processing:
   1. Allow sufficient review time so that installation shall not be delayed as a result of the time required to process submittals, including time for resubmittals.
   2. ENGINEER will review and return submittals with reasonable promptness, or advise CONTRACTOR when a submittal being processed must be delayed for coordination or receipt

of additional information by putting the submittal "On Hold" and returning a transmittal identifying the reasons for the delay.

3. 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.

C. Submittal Preparation:

1. Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
2. Provide a space approximately 4 inches by 5 inches on the label or beside the title block on submittals not originating from CONTRACTOR to record CONTRACTOR's review and approval markings and the action taken.
3. Include the following information on the label for processing and recording action taken.
   a. Project name.
   b. Date.
   c. Name and address of ENGINEER.
   d. Name and address of CONTRACTOR.
   e. Name and address of subcontractor.
   f. Name and address of supplier.
   g. Name of manufacturer.
   h. Number and title of appropriate Specification Section.
   i. Drawing number and detail references, as appropriate.
4. Any markings done by CONTRACTOR shall be done in a color other than red. Red is reserved for ENGINEER's marking.
5. The number of electronic and hard copies to be submitted will be determined at the pre-construction conference. Reproducibles 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.

D. Submittal Transmittal:

1. 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 beginning with the specification section. Resubmittals should have the same number as the original, plus a letter designation for each resubmittal (i.e., 01 33 00-1-A, 01 33 00-1-B, etc.).
2. 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.

1.04 CONSTRUCTION SCHEDULE

A. Bar Chart Schedule:

1. Prepare a fully developed, horizontal bar chart type Construction Schedule. Submit within 30 days of the date established for "Commencement of the Work."

2. Provide a separate time 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 on a sheet, or series of sheets, of stable transparency or other reproducible media, of sufficient width to show data for the 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 on Schedule to allow time for ENGINEER's procedures necessary for certification of Substantial Completion.

B. Schedule Updating: Revise Schedule after each meeting or activity where revisions have been recognized or made within 2 weeks following the meeting or activity.

1.05 SUBMITTAL SCHEDULE

A. After development and acceptance of 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 of construction. 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. Following response to initial submittal, print and distribute copies to ENGINEER, OWNER, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.

E. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

F. Schedule Updating: Revise Schedule after each meeting or activity where revisions have been recognized or made within 2 weeks following the meeting or activity.

1.06 SHOP DRAWINGS

A. 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.

B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates, and similar drawings. Include the following information:
   1. Dimensions.
   2. Identification of products and materials included.
   3. Compliance with specified standards.
   4. Notation of coordination requirements.
   5. Notation of dimensions established by field measurement.

C. 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.

D. Shop Drawings shall indicate shop painting requirements to include type of paint and manufacturer.

E. Standard manufactured items in the form of catalog work sheets showing illustrated cuts of the items to be furnished, scale details, sizes, dimensions, quantity, and all other pertinent information should be submitted and approved in a similar manner.

F. Measurements given on Shop Drawings or standard catalog sheets, as established from Contract Drawings and as approved by ENGINEER, shall be followed. When it is necessary to verify field measurements, they shall be checked and established by CONTRACTOR. The field measurements so established shall be followed by CONTRACTOR and by all affected trades.

G. Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 inches by 11 inches but no larger than 36 inches by 48 inches.

H. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.

1.07 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as Shop Drawings.

B. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
   1. Manufacturer's printed recommendations.
   2. Compliance with recognized trade association standards.
   3. Compliance with recognized testing agency standards.

4. Application of testing agency labels and seals.
5. Notation of dimensions verified by field measurement.
6. Notation of coordination requirements.

C. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

1.08 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 requirements of the Contract Documents; final acceptance will depend upon that compliance.
   2. Final-But-Restricted Release: When submittals are marked "Furnish as Corrected," that part of the Work covered by the submittal may proceed, provided it complies with notation or corrections 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 that 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. 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."
   5. 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.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01 50 00 - TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: This Section specifies procedural and administrative requirements for temporary services and facilities.

B. Temporary Utilities include, but are not limited to:
   1. Water service and distribution.
   2. Temporary electric power.
   3. Public and private utilities coordination.
   4. Storm and sanitary sewer.

C. Temporary Construction and Support Facilities include, but are not limited to:
   1. CONTRACTOR's field offices and storage sheds.
   2. Temporary roads and paving.
   3. Sanitary facilities.

D. Construction Buildings and Facilities include, but are not limited to.
   1. Temporary Project identification signs.
   2. Temporary Project bulletin boards.
   3. Ongoing construction cleanup.

E. Security and Protection Facilities required include, but are not limited to:
   1. Barricades, warning signs, lights.
   2. Enclosure fence for the Site.
   3. Security enclosure and lockup.
   4. Environmental protection.
   5. Control of noise.
   6. On-site burning.
   7. Dust control.

F. Traffic Control Facilities required include, but are not limited to:
   1. Traffic control plan of action.
   2. Maintenance of traffic.
   3. Temporary pavement markings.
   4. Special requirements.

G. Sedimentation Control Facilities required include, but are not limited to:
   1. Soil erosion and sedimentation control.
   2. Stormwater discharge control.
   3. Dewatering trenches and disposal of excess excavated material.
   4. Stream bank protection.
   5. Slope protection - adjacent to stream crossings.
   6. Slope protection.
   7. Final topography protection.

1.02 REFERENCES

A. Natural Resources and Environmental Protection Act, P.A. 451 (Act 451) of 1994.

B. Guidebook of Best Management Practices for Michigan Watersheds.

C. Local Soil Erosion Control Ordinance or requirements.

D. Michigan Manual of Uniform Traffic Control Devices (MMUTCD).

E. Codes and Standards:
   1. Comply with NFPA Code 241, "Building Construction and Demolition Operations," ANSI A10 Series standards for "Safety Requirements for Construction and Demolition," and NECA Electrical Design Library, "Temporary Electrical Facilities."
   2. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services," prepared jointly by AGC and ASC, for industry recommendations.
   3. Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).

1.03 SUBMITTALS

A. Shop Drawings: Submit in accordance with Section 01 33 00, Shop Drawings covering the items included under this Section. Shop Drawing submittals shall include:
   1. CONTRACTOR shall submit the Plan of Action for Traffic Control in 6 copies within 10 days after the Notice to Proceed is issued. CONTRACTOR shall not commence Work on any State trunk line or major artery without written approval of the Plan for that portion of the Contract.
   2. Soil Erosion and Sedimentation Control Program prepared by CONTRACTOR, as specified in this Section, shall be reviewed and have received at least preliminary concurrence from the local Enforcing Agent before it will be presented and discussed at the Pre-Construction Conference, at which time final revisions may be made. Copies of the final agreed program, and Act 451 Permit, shall be delivered to ENGINEER a minimum of 2 weeks prior to beginning any Work on Site.
   3. Temporary Utilities: Submit a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to OWNER, change over from use of temporary service to use of the permanent service.
   4. Contractor shall submit for approval the design for the project sign to be installed prior to having it constructed.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to:
   1. Building Code requirements.
   2. Health and Safety regulations.
   3. Utility Company regulations.
   4. Police, Fire Department, and Rescue Squad rules.
   5. Environmental Protection regulations.
   6. State and Local Soil Erosion and Sedimentation Control regulations.

B. Inspection: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.05 PROJECT CONDITIONS

A. Unless otherwise provided in these Specifications, CONTRACTOR shall make CONTRACTOR's own arrangements for electricity, gas, water, and sewer services for use during the construction of the Work and shall pay for all temporary facilities, connections, extensions, and services.
   1. Cost or use charges for temporary facilities are not chargeable to OWNER or ENGINEER, and will not be accepted as a basis of claims for a Change Order.

B. Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do no overload facilities or permit them to interfere with progress. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on Site.

C. Special Requirements: Special requirements of OWNER and MDOT being specified for traffic control on State trunk lines and major arteries due to the magnitude of traffic disruption involved in this Contract.

1.06 SEQUENCING AND SCHEDULING

A. CONTRACTOR shall inform the local Fire Department in advance of CONTRACTOR's program of street obstruction and detours, so that the Fire Department can set up plans for servicing the area in case of an emergency.
   1. CONTRACTOR shall also notify the public agency having jurisdiction over the roads at least 1 week prior to obstructing any street.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide new materials; if acceptable to ENGINEER, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.

B. Water: Provide potable water approved by local health authorities.

C. Open-Mesh Fencing: Provide 11-gauge, galvanized 2-inch, chain-link fabric fencing 6 feet high with galvanized barbed wire top strand and galvanized steel pipe posts, 1-1/2-inch inside diameter for line posts and 2-1/2-inch inside diameter for corner posts.

D. Seed: Consisting of, per acre, 10 pounds Kentucky 31 fescue, 3 pounds Birdsfoot Trefoil, and 3 pounds white clover.

E. Fertilizers: Consisting of, at least, 200 pounds per acre 12:12:12, or equivalent.

F. Mulches: Consisting of 2 tons per acre of straw or hay. Chemical mulch or other approved material may be used.

G. Traffic Control Devices:
   1. Barricades: When a road or street is closed to all through traffic, movable Type III barricades shall be erected at all points of closures, including cross streets. If barricades are to be left over night, 3 warning lights shall be provided for each Type III barricade.
   2. Barriers: Whenever the excavation on roads open to through traffic exceeds 10 feet below surface grade, portable concrete barriers shall be provided between the open trench and any traffic lanes including barriers at the ends of the trench as necessary. The maximum length of open trench shall be 50 feet.
   3. Lane Control: Provide by using drums to channel the traffic flow, supplemented by guide signs and/or flagpersons as necessary. Lighted arrow panels, Type A, shall be required for lane control on both State trunk lines and all city streets open to through traffic.
   4. Signs: Standard sign sizes and colors, as shown in "MMUTCD," shall be used to make the approach to construction areas and to direct motorists on any detour route. All signs shall be reflectorized.
   5. Temporary Pavement Marking: Complying with Section 811 of Michigan Department of Transportation's 2003 Standard Specifications for Construction.

2.02 EQUIPMENT

A. Provide new equipment; if acceptable to ENGINEER, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.

B. Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110 to 120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.

C. Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.

D. Temporary Storage: Provide prefabricated or mobile units or similar on-site construction with lockable openings.

E. Temporary Toilet Units: Provide self-contained single-occupant toilet units, properly vented and fully enclosed with a glass fiber-reinforced polyester shell or similar nonabsorbent material.

F. First Aid Supplies: Comply with governing regulations.
   1. In other locations, provide hand-carried, portable, UL rated, Class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.
   2. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

G. Bulletin Board: Provide a weather-protected enclosed bulletin board at Site. The bulletin board shall be mounted in a conspicuous and public outside location.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Use qualified personnel for installation of temporary facilities. Locate facilities where they shall serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

3.02 TEMPORARY UTILITY INSTALLATION

A. Water Service and Distribution: CONTRACTOR shall at all times provide for CONTRACTOR's employees an abundant and convenient supply of cool drinking water taken from a potable source.

B. Public and Private Utilities: Where any utilities, water, sewer, gas, telephone, or any other either public or private, are encountered, CONTRACTOR must provide adequate protection for them, and CONTRACTOR shall be held responsible for any damages to such utilities arising from CONTRACTOR's operations.
   1. When it is apparent that construction operations may endanger the foundation of any utility conduit or the support of any structure, CONTRACTOR shall notify the utility Owner of this possibility and CONTRACTOR shall take such steps as may be required to provide temporary bracing or support of conduits or structures.
   2. Where it is the policy of utility Owners to make repairs to damaged conduit or other structures, CONTRACTOR shall cooperate to the fullest extent with the utility, and CONTRACTOR shall see that CONTRACTOR's operations interfere as little as possible with those operations.
   3. When it is necessary to carry out the Work, that an electric, telephone, or light pole be moved to a new location, or moved and replaced after construction, CONTRACTOR shall arrange for the moving of such poles and the lines thereof, and shall pay any charges therefor.
   4. Where existing utilities are encountered along the line of Work, CONTRACTOR shall perform CONTRACTOR's operations in such a manner that service will not be interrupted, and shall, at CONTRACTOR's own expense, make all temporary provisions to maintain service.
   5. Unless otherwise indicated on Drawings, CONTRACTOR shall replace any disturbed sewer or drain, or relay same at a new grade to be established by ENGINEER, such that sufficient clearance for the sewer will be provided.
   6. CONTRACTOR will receive no extra compensation for replacement of sewers or drains encountered, or for relaying at a new grade and/or line where necessary, except where specifically noted otherwise on Drawings or Specifications.
   7. Where existing gas mains and services are encountered, CONTRACTOR shall arrange with the gas company for any necessary relaying, and shall pay for the cost of such work.
   8. Materials used in repairing or relaying utilities shall be the same type and strength as the existing Work.

C. Storm and Sanitary Sewers: If sewers are available, CONTRACTOR may provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide portable units.
   1. If gas is present in existing sewers or tanks where CONTRACTOR must work, they shall be cleared of gas before entering. If the gas cannot be removed by natural ventilation by the

removal of covers, CONTRACTOR shall maintain forced draft to render the area safe as determined by gas detection equipment.

2. Filter out excessive amounts of soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
3. Connect temporary sewers to the municipal system as directed by the sewer department officials.
4. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.
5. Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of stormwater from heavy rains.

3.03 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

A. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
   1. Maintain temporary construction and support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to OWNER.
   2. Provide incombustible construction for offices, shops, and sheds located within the construction area, or within 30 feet of building lines. Comply with requirements of NFPA 241.

B. CONTRACTOR's Field Offices: Provide insulated, weathertight temporary offices of sufficient size to accommodate required office personnel at Site. Keep the office clean and orderly for use for small progress meetings.

C. Temporary Roads and Paving: Construct and maintain temporary roads and paving to adequately support the indicated loading and to withstand exposure to traffic during the construction period. Locate temporary paving for roads, storage areas and parking where the same permanent facilities will be located. Review proposed modifications to permanent paving with ENGINEER.
   1. Comply with Section 02 74 00 for construction and maintenance of temporary asphalt concrete paving.
   2. Coordinate temporary paving development with subgrade grading, compaction, installation and stabilization of subbase, and installation of base and finish courses of permanent paving.
   3. Install temporary paving to minimize the need to rework the installations and to result in permanent roads and paved areas that are without damage or deterioration when occupied by OWNER.
   4. Delay installation of the final course of permanent asphalt concrete paving until immediately before Substantial Completion. Coordinate with weather conditions to avoid unsatisfactory results.
   5. Extend temporary paving in and around the construction area as necessary to accommodate delivery and storage of materials, equipment usage, administration, and supervision.

D. Sanitary Facilities: Sanitary facilities include temporary toilets, wash facilities, and drinking water fixtures. Comply with regulations and health Codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best service the Project's needs.
   1. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide covered waste containers for used material.
   2. Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.

3. Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
4. Provide safety showers, eyewash fountains and similar facilities where needed for safety and sanitation of personnel.

3.04 CONSTRUCTION BUILDINGS AND FACILITIES INSTALLATION

A. Temporary Project Identification Signs: Engage an experienced sign painter to apply graphics. Comply with details indicated in the drawings. Verify with ENGINEER final wording of graphics to be placed on sign and final location of sign. Signs are intended to be mounted on the WTP fence and on the gate to the lagoon on Hatcher Street. Obtain sign permit from local authority.

B. Temporary Project Bulletin Board: As a minimum, the following items must be posted:
1. Wage Rates (when applicable).
2. Safety Poster (OSHA or State OSHA).
3. Nondiscrimination Poster.
4. Equal Employment Opportunity Statement signed by a Company official.
5. Grading Permit (Soil Erosion and Sedimentation Control Act 451).

C. Ongoing Construction Cleanup: Project cleanup shall be an ongoing operation. CONTRACTOR shall maintain an order of neatness and good housekeeping comparable to that maintained by OWNER. Project cleanup applies to the Site and all areas affected by construction operations. CONTRACTOR shall:
1. Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 degrees F (27 degrees C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.
2. Maintain dirt and debris resulting from CONTRACTOR's operations in designated spoil piles as approved by ENGINEER or remove from the Site daily. Dirt and debris shall not collect or interfere with OWNER's facility operations. Excess dirt and debris shall be removed from the Site as needed to confine spoil piles in designated areas.
3. Perform general cleanup inside of OWNER's buildings at least once every two weeks. Cleanup shall include consolidation of stored materials, removal of waste material and debris, and sweeping of flooring surfaces.
4. Maintain clear access to all properties affected by construction activities. Maintain unobstructed access to existing buildings, equipment, safety equipment, and other items requiring OWNER access for facility operation.
5. Keep tools, equipment, and materials in a neat and orderly arrangement.
6. Maintain culverts, sewers, and drainage structures by removing sediment and debris from construction operations.
7. Repair all holes and ruts resulting from construction operations that affect OWNER's use of property with approved material; compact, level, and restore.

3.05 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer as requested by ENGINEER.

B. Barricades, Warning Signs, and Lights: Comply with Standards and Code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.

C. Enclosure Fence for the Site: When excavation begins, install an enclosure fence with lockable entrance gates. Locate where indicated, or enclose the entire Site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering the Site, except by the entrance gates.
   1. Provide open-mesh, chain-link fencing with posts set in a compacted mixture of gravel and earth.

D. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
   1. Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

E. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the Site.

F. Control of Noise: CONTRACTOR shall eliminate noise to as great an extent as possible at all times. Air compressors shall be equipped with silencers, and the exhaust of all gasoline motors and other power equipment shall be provided with mufflers.
   1. In the vicinity of hospitals, libraries, and schools, special precautions shall be taken to avoid noise and other nuisance, and CONTRACTOR shall require strict observances of all pertinent ordinances and regulations. Any blasting permitted in such locations shall be done with reduced charges.

G. On-Site Burning: Burning of waste materials resulting from the Work under this Contract will not be allowed unless authorized in writing by OWNER. Where burning is not allowed, CONTRACTOR shall haul all waste materials from Site and dispose of same in a manner acceptable to ENGINEER.
   1. The costs of hauling and disposal of waste materials shall be included in other items of the Work under this Contract.

H. Dust Control: CONTRACTOR shall take all steps necessary for the alleviation or prevention of dust nuisance caused by or resulting from CONTRACTOR's operations and shall apply water or dust palliative, or both, as required. No direct payment will be made for any such Work performed or materials used to control dust from this Contract.

3.06 TRAFFIC CONTROL FACILITIES INSTALLATION

A. Traffic Control Plan of Action: CONTRACTOR's Plan of Action shall be based upon OWNER's requirements for Traffic Control and shall detail specific detour routes including individual sign markings and locations. CONTRACTOR shall also propose CONTRACTOR's intended method for lane control within the construction Work areas. The Plan of Action shall include long-term maintenance of traffic control devices for Work that is not completed during a construction season or for extended periods when Work is not performed.
   1. OWNER and/or MDOT shall approve the proposed Plan of Action. Modifications to the proposed Plan of Action resulting in changes to the Bid quantities shall be adjusted as required during CONTRACTOR's submittal of monthly payment estimates.
   2. In addition to the Plan of Action, this Work shall consist of the furnishing, installation, operation, maintenance, and removal of the traffic control devices described in this Section.
   3. The location, type, and wording of warning and guide signs shall be proposed by CONTRACTOR as part of CONTRACTOR's required Plan of Action for Traffic Control.

B. Maintenance of Traffic: During the progress of Work, CONTRACTOR shall accommodate both vehicular and pedestrian traffic as provided in these Specifications and as indicated on Drawings.
   1. In the absence of specific requirements, CONTRACTOR shall maintain such traffic. Access to fire hydrants, water, and gas valves shall always be maintained.
   2. CONTRACTOR's truck and equipment operations on public streets shall be governed by all local traffic ordinances and regulations of the Fire and Police Departments and the Department of Public Works. Work within State highway rights-of-way shall be under the jurisdiction of the Michigan Department of Transportation.
   3. Small street openings necessary for manholes, alignment holes, pipe connections, etc., will be permitted. Such holes shall not be open longer than necessary and shall be protected in accordance with the requirements of the local agency having jurisdiction, and any traffic detouring necessary shall be done to the satisfaction of the Agency. Whenever possible, small openings shall be covered with steel plates at pavement level and secured in place at the time that Work is being performed.
   4. Where streets are partially obstructed, CONTRACTOR shall place and maintain temporary driveways, ramps, bridges and crossings which, in the opinion of ENGINEER, are necessary to accommodate the public. As part of the Work under this Contract, CONTRACTOR shall be responsible for providing and maintaining flagpersons, warning lights, signs, and/or barricades, including necessary detour signs outside the Project limits as required to direct and protect vehicular and pedestrian traffic. In the event of CONTRACTOR's failure to comply with the foregoing provisions, 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 CONTRACTOR under this Contract; but the performance of such Work by OWNER, or at OWNER's insistence, shall serve in no way to release CONTRACTOR from CONTRACTOR's liability for the safety of the traveling public.
   5. CONTRACTOR shall inform the local Fire Department in advance of CONTRACTOR's program of street obstruction and detours, so that the Fire Department can set up plans for servicing the area in case of an emergency. CONTRACTOR shall also notify the public agency having jurisdiction over the roads at least 1 week prior to obstructing a road.
   6. Complete all Work as required, such as pipe stubs to connecting mains or utility service replacements, while constructing mains, so the street will only be closed once.
   7. Complete new or restored roadways along a street during the same construction season as the trench work. Work that is not completed within the same construction season (winter

construction periods) shall have all traffic control devices maintained and serviced on a biweekly basis. CONTRACTOR shall, upon written notification by OWNER or ENGINEER, re-erect or replace missing, damaged, or relocated barricades and signage.

8. Coordinate traffic rerouting with roadwork by others so as to minimize the disruption of traffic.
9. Shaft locations shall be selected at points where they will interfere with traffic as little as possible and their working site arrangements shall meet the approval of ENGINEER. Detouring of traffic shall be done in accordance with the requirements of the public agencies having jurisdiction over the roads.
10. In the event of CONTRACTOR's failure to comply with the foregoing provisions, 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 CONTRACTOR under this Contract; but the performance of such Work by OWNER, or at OWNER's insistence, shall serve in no way to release CONTRACTOR from CONTRACTOR's liability for the safety of the traveling public.

C. Special Requirements:
   1. CONTRACTOR may not utilize Cooley Street or Sunset Road across Wines Elementary School property to access the sites with any construction traffic.

3.07 SEDIMENTATION CONTROL FACILITIES INSTALLATION

A. Soil Erosion and Sedimentation Control: CONTRACTOR shall take all precautions necessary to prevent soil erosion of areas disturbed by the construction and shall ensure that all soil erosion be contained within the construction Site. CONTRACTOR shall provide temporary slope protection, temporary dikes, etc., as required to prevent eroded materials from entering any sewers or natural watercourses.
   1. CONTRACTOR shall comply with Natural Resources and Environmental Protection Act, P.A. 451 (Act 451) of 1994, Part 91 of the Michigan Complied Laws and local city or county soil erosion control programs.
   2. CONTRACTOR shall prepare a Soil Erosion and Sedimentation Control Program for submittal to and approval by Local Soil Erosion and Sedimentation Control Agent prior to start of construction, as required in the following paragraphs. Copies of State guidelines "Better Environment through Soil Erosion and Sedimentation Control" and "Protection of Natural Resources" DEQ Handbook of Specifications may be obtained at no charge from the Michigan Department of Environmental Quality (MDEQ). The "Michigan Soil Erosion and Sedimentation Control Guidebook" and the "Guidebook of Best Management Practices for Michigan Watersheds" may also be obtained from MDEQ.
   3. Since it is impractical to identify specific potential soil erosion problems along a water main route, CONTRACTOR, after award but prior to the Pre-Construction Conference, together with the local soil erosion Enforcing Agent, shall identify all potential soil erosion problem areas and prepare a detailed Soil Erosion and Sedimentation Control Program satisfying CONTRACTOR's specific method of operation. This program shall include as a minimum, but not necessarily be limited to, the following:
      a. Identify on a separate set of Drawings all soil erosion problem areas.
      b. Identify specific control structure using DEQ United Keying System from the "Michigan Soil Erosion and Sedimentation Control Guidebook" to be placed to control erosion and to prevent soil from entering storm sewers and streams.
      c. Indicate timing of placement and removal of structures both in relationship to time of year and to sequence of construction.
      d. Indicate timing of completion of cleanup and surface restoration after control structures are removed.

4. The Soil Erosion and Sedimentation Control Program, prepared by CONTRACTOR, shall be reviewed and have received at least preliminary concurrence from the local Enforcing Agent before it will be presented and discussed at the Pre-Construction Conference, at which time final revisions may be made. Copies of the final agreed program shall be made available for ENGINEER and the local Enforcing Agent. Should the local regulatory agency determine at any time during construction that the construction operation is in violation of the Act and cite OWNER, CONTRACTOR or subcontractor shall take immediate action, as directed by OWNER, to ensure compliance with the Act.

B. Stormwater Discharge Control:
   1. CONTRACTOR shall comply with Natural Resources and Environmental Protection Act, P.A. 451 (Act 451) of 1994, Part 31 of the Michigan Complied Laws and local city or county stormwater discharge control programs.
   2. CONTRACTOR shall not begin any Work at Site until the stormwater discharge permit has been obtained for the Project.
      a. CONTRACTOR shall indemnify OWNER against any and all fines for discharge permit violations which are assessed against OWNER, and which are due to CONTRACTOR's actions or failure to maintain the sedimentation control measures.
   3. CONTRACTOR shall utilize the appropriate Best Management Practices to prevent any of CONTRACTOR's activities from resulting in an unlawful discharge of pollutants to the waters of the State. CONTRACTOR shall correct any deficiencies noted by ENGINEER, Local Enforcement Agency or MDEQ within 24 hours of receiving written notice that corrections are necessary. Should CONTRACTOR fail to take action within the allotted time, OWNER shall have the right to perform the work and deduct all costs from amounts due CONTRACTOR under this Contract.

C. Dewatering Trenches and Disposal of Excess Excavated Material:
   1. Pumping or draining from trench excavations shall be made on either side of the pipeline and not into the waters of the State. It shall be CONTRACTOR's responsibility to secure the necessary approval of private landowners before discharging water from the trench excavation onto private lands. Water shall be discharged in such a manner as to cause no pollution or erosion problems.
   2. CONTRACTOR shall dewater to existing storm sewer systems wherever possible; method of disposal shall be approved by OWNER. All discharge from dewatering wells discharged onto the ground ahead of being piped to a natural watercourse or lake via an existing storm sewer system or by a temporary piping system shall have built at the point of entry into such storm sewer a silt retention structure.
   3. The silt retention structure may consist of several straw bales adequately anchored and placed as directed by ENGINEER. Any eventual silt or solids retained in the area of these structures shall be removed prior to removal of the structure. At no time will silt or similar materials be permitted to filter into a lake or natural watercourse. There shall be no sidecasting of any excavated material into any waterway. Excess excavated material from stream crossings and excavation near streams shall be removed and disposed of elsewhere, and not within the floodplain.

D. Final Topography Protection: When final topography has been established, all bared soil shall be seeded, fertilized, and mulched in an effort to restore to a protected condition, except in flat, active farm fields. Critical areas shall be sodded as specified under Section 02 31 50.
   1. The permanent protection measures shall be in effect not more than 30 days after the earth change is completed, except at tie-in areas at both sides of the stream where temporary measures

will be installed within 3 days following a pipeline crossing. Temporary measures may include a row of sandbags at the top of the bank, a row of pegged bales of straw, or an earth berm or diversion ditch. These temporary measures shall be maintained until permanent measures are installed.

2. Where construction involves placing pipes in roadways or under other impervious materials, special care shall be provided by CONTRACTOR.
3. Provide control measures at all storm sewer catch basins by providing straw or other types of filters or construct sediment traps adjacent to inlets.
4. If a roadway has a grass ditch area, minimize disturbance and provide filter berms (straw or gravel) or sediment traps as appropriate.
5. Provide proper downdrain structures to control increased runoff to streams and drains.
6. Stabilize the roadway as soon as possible after placement of the utility. Temporary erosion control measures shall be instituted until final paving is complete. Such measures may include a subbase surfacing application or gravel surfacing. Compaction of soil may suffice if other control measures are affected.

3.08 FIELD QUALITY CONTROL

A. Any unforeseen situations that may be encountered during the course of construction that may cause accelerated erosion and deposition of sediment into waterways and/or lakes shall be controlled by methods that may include sediment traps, sediment basins, or holding ponds. Any slope failures or development of gullies after construction has been completed shall be corrected immediately.

B. Should the local Regulatory Agency determine at any time during construction that the construction operation is in violation of the Natural Resources and Environmental Protection Act, P.A. 451 (Act 451) of 1994 and cite OWNER, CONTRACTOR or Subcontractor shall take immediate action, as directed by OWNER, to ensure compliance with the Act.

3.09 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
   1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour-day basis where required to achieve indicated results and to avoid possibility of damage.

C. Protection: Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

D. Termination and Removal: Unless ENGINEER requires that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
   1. Materials and facilities that constitute temporary facilities are property of CONTRACTOR. OWNER reserves the right to take possession of Project identification signs.

END OF SECTION

SECTION 01 60 00 - GENERAL EQUIPMENT STIPULATIONS

PART 1 - GENERAL

1.01 SUMMARY

A. These General Equipment Stipulations apply, in general, to all equipment provided under other Specification Sections. They shall supplement the detailed equipment specifications, but in cases of conflict the equipment specifications shall govern.

1.02 QUALITY ASSURANCE

A. Compliance with OSHA: All equipment provided under this Contract shall meet all the requirements of the Federal and/or State Occupational Safety and Health Acts. Each equipment supplier shall submit to ENGINEER certification that the equipment furnished is in compliance with OSHA.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Anchor Bolts: Anchor bolts, nuts, and washers shall be hot-dipped galvanized in conformity with ASTM A 385 and be supplied with sleeves.

B. Shop Painting:
   1. Non-submerged Applications: Tnemec Series 37H, Chem-Prime.
   2. Submerged, Non-potable Applications: Tnemec Series 66, Hi-Build Epoxoline.
   3. Submerged, Potable Applications: Tnemec Series 139, Pota-Pox II.
   4. Rust preventive compound shall be:
      a. Dearborn Chemical, No-Ox-ID2W.
      b. Houghton, Rust Veto 344.
      c. Rust-Oleum R-9.

2.02 COMPONENTS

A. Anchor Bolts: All necessary anchor bolts shall be provided as per the manufacturer's recommendations for size, strength, and location and shall meet the requirements of Standard Details on Drawings. Substantial templates and working drawings for installation shall be provided. Two nuts shall be furnished.
   1. Unless otherwise shown or specified, anchor bolts for items of equipment mounted on baseplates shall be long enough to permit 1-1/2 inches of grout beneath the baseplate and to provide adequate anchorage into structural concrete.

2.03 FABRICATION

A. Shop Painting: All iron and steel surfaces shall be protected by suitable paint or coatings applied in the shop or at point of fabrication. Surfaces which will be inaccessible after assembly shall be protected for the life of the equipment.

1. All iron and steel surfaces which will be totally or partially submerged or located in a continuously or intermittently moist atmosphere during normal operation shall be shop blast cleaned to a near-white finish, removing all dirt, rust-scale, and foreign matter by any of the recommended methods outlined in the Steel Structures Painting Council Specification SP-10.
2. The cleaned surfaces shall be shop primed before any rust bloom forms. All other exposed surface shall be properly filed, scraped, sanded, etched, brushed, sandblasted, and/or cleaned to provide surfaces free from dirt, loose crystals, rust, scale, oil, and grease and shop primed.
3. Shop primed surfaces shall be painted with one or more coats of a primer which meets the requirements of this Section. Minimum shop coat thickness shall be 1.5 dry mills.

B. The exterior surfaces of all ground-buried valves shall receive a coal tar or bituminous coating in accordance with manufacturer's standards. The inside surfaces of all valves shall be coated with coal-tar pitch varnish in accordance with the latest AWWA Specifications.

C. Where specified, steel and iron surfaces shall be hot-dipped galvanized in conformity with ASTM A 153 and A 385.

D. Machined, polished, and nonferrous surfaces which are not to be painted or galvanized shall be coated with rust preventive compound.

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01 77 00 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements for Contract closeout including, but not limited to:
   1. Warranties and Bonds.
   2. Requirements for Substantial Completion.
   3. Project record document submittal.
   4. Equipment acceptance.
   5. Operating and maintenance manual submittal.
   6. Final cleaning.

B. Refer to the General Conditions for terms of CONTRACTOR's special warranty of workmanship and materials.

C. Specific requirements for warranties for the Work and products and installation that are specified to be warranted, are included in the individual Sections of Divisions 2 through 16.

D. Certifications and other commitments and agreements for continuing services to OWNER are specified elsewhere in the Contract Documents.

1.02 WARRANTY REQUIREMENTS

A. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve CONTRACTOR of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with CONTRACTOR.

B. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

C. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

D. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. CONTRACTOR is responsible for the cost of replacing or rebuilding defective Work regardless of whether OWNER has benefited from use of the Work through a portion of its anticipated useful service life.

E. OWNER's Recourse: Written warranties made to OWNER are in addition to implied warranties, and shall not limit the duties, obligations, rights, and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which OWNER can enforce such other duties, obligations, rights, or remedies.

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

G. OWNER reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

1.03 SUBSTANTIAL COMPLETION

A. 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 certificates, and similar releases.
   6. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

B. 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 the completed inspection will form the basis of requirements for final acceptance.

C. The warranty period for specific portions of the Work will begin on the date established on Component Acceptance Form or at such other date as agreed by OWNER, ENGINEER, and CONTRACTOR.

1.04 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, and the list has been endorsed and dated by ENGINEER.

4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the 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, final Project photographs, 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 start-up testing of systems, and instruction of OWNER's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.

B. Reinspection Procedure: ENGINEER will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to ENGINEER.
1. Upon completion of reinspection, ENGINEER will prepare a certificate of final acceptance, or advise CONTRACTOR of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
2. If necessary, reinspection will be repeated.

1.05 SUBMITTALS

A. Submit written warranties to ENGINEER prior to the date certified for Substantial Completion. If ENGINEER's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of ENGINEER.

B. When a designated portion of the Work is completed and occupied or used by OWNER, by separate agreement with CONTRACTOR during the construction period, submit properly executed warranties to ENGINEER within 15 days of completion of that designated portion of the Work.

C. When a special warranty is required to be executed by CONTRACTOR, or CONTRACTOR and a subcontractor, supplier, or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to OWNER through ENGINEER for approval prior to final execution.

D. Refer to individual Sections of Divisions 2 through 16 for specific content requirements, and particular requirements for submittal of special warranties.

1.06 RECORD DOCUMENT SUBMITTALS

A. Record Drawings:
1. Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown.

2. Mark whichever Drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
3. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
4. Mark new information that is important to OWNER, but was not shown on Contract Drawings or Shop Drawings.
5. Note related Change Order numbers where applicable.
6. Organize Record Drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates, and other identification on the cover of each set.

B. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work.
1. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to ENGINEER for OWNER's records.

C. Operation and Maintenance Manuals: Submit in accordance with requirements of Section 01 60 00, operation and maintenance manuals for items included under this Section.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 FINAL CLEANING

A. General cleaning during construction is required by the General Conditions and included in Section 01 50 00.

B. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

C. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
1. Remove labels that are not permanent labels.
2. Clean Site, including landscape development areas, of rubbish, litter, and foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth even-textured surface.

D. Comply with regulations of authorities having jurisdiction and safety standards for cleaning.
1. Do not burn waste materials. Do not bury debris or excess materials on OWNER's property.
2. Do not discharge volatile, harmful, or dangerous materials into drainage systems.
3. Remove waste materials from Site and dispose of in a lawful manner.

E. Where extra materials of value remaining after completion of associated Work have become OWNER's property, arrange for disposition of these materials as directed.

END OF SECTION

SECTION 01 80 00 – CERTIFIED PAYROLL COMPLIANCE AND REPORTING

PART 1 - GENERAL

1.01 SUMMARY

This specification covers all administrative requirements, payroll reporting procedures to be followed by Contractors performing work on City-sponsored public improvements projects, and all other miscellaneous and incidental costs associated with complying with the applicable sections of the City of Ann Arbor Code of Ordinances with regard to payment of prevailing wages and its Prevailing Wage Compliance policy.

This specification is **not** intended to include the actual labor costs associated with the payment of prevailing wages as required. Those costs should be properly incorporated in all other items of work bid.

1.02 GENERAL

The Contractor is expected to comply with all applicable sections of Federal and State prevailing wage laws, duly promulgated regulations, the City of Ann Arbor Code of Ordinances, and its Prevailing Wage Compliance Policy as defined within the contract documents. The Contractor shall provide the required certified payrolls, city-required declarations, and reports requested elsewhere in the contract documents within the timeline(s) stipulated therein.

The Contractor shall also provide corrected copies of any submitted documents that are found to contain errors, omissions, inconsistencies, or other defects that render the report invalid. The corrected copies shall be provided when requested by the Supervising Professional.

The Contractor shall also attend any required meetings as needed to fully discuss and ensure compliance with the contract requirements regarding prevailing wage compliance. The Contractor shall require all employees engaged in on-site work to participate in, provide the requested information to the extent practicable, and cooperate in the interview process. The City of Ann Arbor will provide the needed language interpreters in order to perform wage rate interviews or other field investigations as needed.

Certified Payrolls may be submitted on City-provided forms or forms used by the Contractor, as long as the Contractor's forms contain all required payroll information. If the Contractor elects to provide their own forms, the forms shall be approved by the Supervising Professional prior to the beginning of on-site work.

1.03 UNBALANCED BIDDING

The City of Ann Arbor will examine the submitted cost for this item of work prior to contract award. If the City determines, in its sole discretion, that the costs bid by the Contractor for complying with the contract requirements are not reasonable, accurately reported, or may contain discrepancies, the City reserves the right to request additional documentation that fully supports and justifies the price as bid. Should the submitted information not be determined to be reasonable or justify the costs, the City reserves the right to pursue award of the contract to the second low bidder without penalty or prejudice to any other remedies that it may have or may elect to exercise with respect to the original low-bidder.

The Contract Completion date will not be extended as a result of the City's investigation of the as-bid amount for this item of work, even if the anticipated contract award date must be adjusted. The only exception will be if the Contractor adequately demonstrates that their costs were appropriate and justifiable. If so, the City will adjust the contract completion date by the number of calendar days commensurate with the length of the investigation, if the published Notice to Proceed date of the work cannot be met. The contract unit prices for all other items of work will not be adjusted regardless of an adjustment of the contract completion date being made.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 02 22 50 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Selective Demolition Work requires selective removal and off-Site disposal of following:
   1. Items indicated for demolition or removal in the contract drawings

B. Related Documents: Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Sections, apply to Work of this Section.

1.02 DEFINITIONS

A. Remove: Remove and dispose of items shown or scheduled. Discard demolished or removed items except for those shown to remain, those shown as reinstalled, those shown as salvaged, and historical items that are to remain OWNER’s property.

B. Remove and Salvage: Items shown as "remove and salvage" remain OWNER’s property. Carefully remove and clean salvage items; pack or crate to protect against damage.

C. Remove and Reinstall: Remove items shown; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in same location or in location shown.

D. Existing to Remain: Protect construction or items shown to remain against damage during selective demolition operations. When permitted by ENGINEER, CONTRACTOR may elect to remove items to suitable, protected storage location during selective demolition and properly clean and reinstall items in their original locations.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Demolition operations shall comply with OSHA and EPA requirements and EPA notification regulations insofar as they apply to selective demolition Work under this Contract.
   2. Comply with hauling and disposal regulations of authorities having jurisdiction.
   3. If hazardous materials are found during selective demolition operations, comply with applicable paragraphs of General Conditions.

B. Pre-Installation Meetings:
   1. Do not close, block, or obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction.
      a. Use alternative routes around closed or obstructed routes if required by governing regulations.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Disassemble or cut large items into smaller pieces to promote safe removal and transportation.
   1. Haul away and dispose of debris and materials neither retained by OWNER, nor reused or reinstalled.
   2. Arrange for disposal areas.
   3. Traffic: Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

B. Handling: CONTRACTOR shall take every precaution to prevent spillage of materials being hauled in public streets.
   1. It shall be CONTRACTOR's responsibility to immediately clean spillage that may accidentally occur.
   2. Do not burn removed material on or within Project Site.

1.05 PROJECT CONDITIONS

A. Materials Ownership:
   1. Salvage Materials: Demolished materials shall become CONTRACTOR's property, except for items or materials shown as reused, salvaged, reinstalled, or otherwise shown to remain OWNER's property. Remove demolished material promptly from Site with further disposition at CONTRACTOR's option.
   2. Historical artifacts, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other articles of historical significance remain property of OWNER. Notify OWNER's Representative when these items are found and obtain method of removal and salvage from OWNER.
   3. Transport items of salvageable value to CONTRACTOR (CONTRACTOR's area) as they are removed. Storage or sale of demolition items on-Site is not allowed.

B. Environmental Requirements: Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations relating to environmental protection. Do not use water when it may create hazardous or objectionable conditions including ice, flooding, and pollution.

C. Existing Conditions: OWNER will be continuously occupying building areas immediately adjacent to selective demolition areas.

D. OWNER assumes no responsibility for actual condition of items or structures scheduled for selective demolition.

E. OWNER will maintain conditions existing at Contract commencement insofar as practical. However, variations within structure may occur by OWNER's removal and salvage operation before selective demolition Work begins.

1.06 SEQUENCING

A. Conduct selective demolition Work in manner that minimizes need for disruption or interference of OWNER's normal on-Site operations.

B. Include coordination for shutoff, capping, and continuation of utility services together with details for dust and noise control protection to ensure uninterrupted on-Site operations by OWNER.

1.07 SCHEDULING

A. Arrange selective demolition schedule so as not to interfere with OWNER's On-Site operations.

B. Give minimum of 72 hours advance notice to OWNER of demolition activities which affect OWNER's normal operations.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 EXAMINATION

A. Site Verification of Conditions: Before beginning selective demolition Work, inspect areas of Work. Survey existing conditions and correlate with requirements shown to determine extent of selective demolition required. Photograph existing structure surfaces, equipment, or surrounding properties which could be misconstrued as damage resulting from selective demolition Work. File with OWNER's Representative before starting Work.

B. Verify disconnection and capping of utilities within the affected area of Work.

3.02 UTILITY SERVICES

A. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction.

B. Maintain existing utilities shown as remaining. Keep in service and protect existing utilities against damage during selective demolition operations.

C. Locate, identify, stub off, and disconnect utility services that are not to remain active.
   1. OWNER will arrange to shut off designated utilities when requested by CONTRACTOR.
   2. Arrange to shut off utilities with utility companies.

3.03 PREPARATION

A. Protect existing finish Work that remains in place and becomes exposed during selective demolition operations.

B. Remove protection at completion of Work.

3.04 DEMOLITION

A. Completely fill below-grade areas and voids resulting from selective demolition Work. Either:
   1. Provide fill consisting of approved earth, gravel, or sand.
   2. Fill shall be free of trash, debris, stones over 6-inch diameter, roots, or other organic matter.

B. Explosives: Use of explosives is not allowed.

C. Site Tolerances: Provide services for effective air and water pollution controls required by local authorities having jurisdiction.

3.05 REPAIR\RESTORATION

A. Repair damages caused by demolition that was more extensive than required.

B. Return structures and surfaces to condition existing before commencement of selective demolition Work.

C. Repair adjacent construction or surfaces soiled or damaged by selective demolition Work.

D. Promptly repair damages caused to adjacent facilities by selective demolition Work at no cost to OWNER.

3.06 CLEANING

A. CONTRACTOR shall maintain an order of neatness and good housekeeping comparable to that observed by OWNER.

B. Keep tools, scaffolding, and other demolition equipment in neat and orderly arrangement.

C. Remove dirt and debris resulting from CONTRACTOR's demolition operations from Site daily. Dirt and debris shall not collect or interfere with OWNER's facility operations.

D. Upon completion of selective demolition Work, remove tools, equipment, and demolished materials from Site. Remove protection and leave interior areas broom clean.

END OF SECTION

SECTION 02 23 00 - SITE CLEARING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes the following:
   1. Protection of existing trees.
   2. Removal of trees and other vegetation.
   3. Topsoil stripping.
   4. Clearing and grubbing.
   5. Removing above-grade improvements.
   6. Removing below-grade improvements.

1.02 DEFINITIONS

A. Topsoil: Friable clay loam surface soil found in a depth of not less than 4 inches. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 2 inches in diameter, and without weeds, roots, and other objectionable material.

1.03 PROJECT CONDITIONS

A. Traffic: Conduct Site clearing operations to ensure minimum interference with roads, streets, driveways, onsite parking, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 PREPARATION

A. Protection of Existing Improvements: Provide protections necessary to prevent damage to existing improvements indicated to remain in place.
   1. Protect improvements on adjoining properties and on OWNER's property.
   2. Restore damaged improvements to their original condition, as acceptable to property OWNER.

B. Protection of Existing Trees and Vegetation: Protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary guards to protect trees and vegetation to be left standing.
   1. Water trees and other vegetation to remain within limits of Work as required to maintain their health during course of construction operations.

2. Provide protection for roots over 1-1/2-inch diameter that are cut during construction operations. Coat cut faces with emulsified asphalt, or other acceptable coating, formulated for use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out; cover with earth as soon as possible.
3. Repair or replace trees and vegetation indicated to remain which are damaged by construction operations, in a manner acceptable to ENGINEER. Employ a licensed arborist to repair damages to trees and shrubs.
4. Replace trees which cannot be repaired and restored to full-growth status, as determined by arborist.

C. Carefully remove items indicated to be salvaged, and store on OWNER's premises where indicated or directed.

3.02 SITE CLEARING

A. Remove trees, shrubs, grass, and other vegetation, improvements, or obstructions as required to permit installation of new construction. Remove similar items elsewhere on Site or premises as specifically indicated. "Removal" includes digging out and off-site disposing of stumps and roots.
1. Cut minor roots and branches of trees indicated to remain in a clean and careful manner, where such roots and branches obstruct installation of new construction.
2. Strip topsoil to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material.
a. Remove heavy growths of grass from areas before stripping.
b. Where existing trees are indicated to remain, leave existing topsoil in place within drip lines to prevent damage to root system.
c. Stockpile topsoil in storage piles in areas indicated or directed. Construct storage piles to provide free drainage of surface water. Cover storage piles, if required, to prevent wind erosion.
d. Dispose of unsuitable or excess topsoil same as specified for disposal of waste material.

B. Clearing and Grubbing: Clear Site of trees, shrubs, and other vegetation, except for those indicated to be left standing.
1. Completely remove stumps, roots, and other debris protruding through ground surface.
2. Use only hand methods for grubbing inside drip line of trees indicated to remain.
3. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
4. Place fill material in horizontal layers not exceeding 6 inches loose depth, and thoroughly compact to a density equal to adjacent original ground.

C. Remove existing above-grade and below-grade improvements as indicated and as necessary to facilitate new construction.
1. Abandonment or removal of certain underground pipe or conduits may be indicated on mechanical or electrical Drawings, and is included under Work of related Divisions 15 and 16 Sections. Removal of abandoned underground piping or conduit interfering with construction is included under this Section.

3.03 DISPOSAL OF WASTE MATERIALS

A. Burning is not permitted on OWNER's property.

B. Transport non-combustible waste materials and unsuitable topsoil materials to designated spoil areas on OWNER's property and dispose of as directed.

C. Transport waste materials and unsuitable topsoil materials to designated spoil areas on OWNER's property and dispose of as directed.

D. Remove waste materials and unsuitable or excess topsoil from OWNER's property at CONTRACTOR's expense. CONTRACTOR shall make own arrangements for obtaining disposal areas. Proposed haul routes between the Site and disposal areas shall be submitted by CONTRACTOR to ENGINEER for approval prior to commencing this Work.

END OF SECTION

SECTION 02 31 50 - EXCAVATION AND BACKFILL (SEWERS AND WATER MAIN)

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Excavation, trenching, complete and continual dewatering of excavation, sheeting, bracing and shoring of sides of excavation, backfilling around structures and over pipe lines, and disposal of excess excavated material.

1.02 REFERENCES

A. MDOT Standard Specifications for Construction, 2012 Edition:
   1. 902 Aggregates.

B. ASTM:
   1. D 1557 Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3) - Modified Proctor Test.
   2. D 2487 Classification of Soils for Engineering Purposes.

1.03 DEFINITIONS

A. Earth: Earth, as a name for excavated material, shall include all glacial deposit whether cemented or not, except solid boulders 1/2 cubic yard or more in volume. It shall include all alluvial deposits and material of every kind that can be excavated with equal facility by the equipment and means used for other earth excavation in Work.

B. Rock: Rock, as a name for excavated material, shall include pre-glacial solid ledge rock that can be removed most practically by blasting, barring, or wedging, or by some other standard method of quarrying solid rock. It shall include solid boulders of 1/2 cubic yard or more in volume, existing concrete, masonry with mortar joints, or other existing structural work that can be excavated practically only by methods of quarrying solid rock. It shall not include fragile, friable, or disintegrated materials of any kind that can be excavated with equal facility by equipment and means used for earth excavation.

C. Site-excavated Backfill: Site-excavated backfill shall be defined as site-excavated material, free from frozen earth, boulders, rocks, stones larger than 6 inches in size, debris, and organic material.

D. Granular Fill: Granular fill shall be defined as sharp sand, gravel, or crushed stone, free from lumps of clay, soft or flaky material and shall conform to MDOT Section 902.07, Granular Materials for Fill and Subbase.

E. Subgrade: The undisturbed earth or the compacted soil layer immediately below granular subbase, drainage fill, or topsoil materials.

F. Subbase: The layer of specified materials of designed thickness placed on the subgrade as part of the pavement structure.

G. Structure: Buildings, foundations, slabs, tanks, curbs, or other man-made stationary features occurring above or below ground surface.

1.04 SUBMITTALS

A. Test and Inspection Reports: Written reports shall be submitted to ENGINEER, with copy to CONTRACTOR, documenting testing and/or inspection results. The reports shall be prepared as noted under Section 01 45 00. Tests shall include:
   1. Test reports on borrow material.
   2. Gradation analysis for granular backfill and subbase materials.
   3. Field reports; in-place soil density tests will be performed by a representative of OWNER.

1.05 QUALITY ASSURANCE

A. Codes and Standards: Perform excavation work in compliance with applicable requirements of authorities having jurisdiction. Construct subbase in accordance MDOT Standard Specifications for Construction.

B. Testing and Inspection Service: OWNER will employ and pay for a qualified independent geotechnical testing and inspection laboratory to perform soil testing and inspection service during earthwork operations.

1.06 PROJECT CONDITIONS

A. Existing Utilities: Locate existing underground utilities in areas of excavation work. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.

B. CONTRACTOR shall notify MISS-DIG, Utility Communications System, 1-800-482-7171, three working days prior to starting any excavation with power equipment.
   1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility Owner immediately for directions. Cooperate with OWNER and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility Owner.
   2. Do not interrupt existing utilities serving facilities occupied by OWNER or others during occupied hours except when permitted in writing by ENGINEER, and then only after acceptable temporary utility services have been provided.
   3. Provide minimum of 2 working days notice to ENGINEER and receive written notice to proceed before interrupting any utility.
   4. Demolish and completely remove from Site existing underground utilities indicated to be removed. Coordinate with utility companies for shutoff of services if lines are active.

C. Use of Explosives: Use of explosives is not permitted.

D. Protection of Persons and Property: Barricade open excavations occurring as part of this Work and post with warning lights.
   1. Operate warning lights as recommended by authorities having jurisdiction.
   2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

3. Perform excavation by hand within drip line of large trees to remain. Protect root systems from damage or dryout to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with moistened burlap.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

A. Satisfactory soil materials are defined as those complying with ASTM D 2487 soil classification Groups GW, GP, GM, SM, SW, and SP.

B. Unsatisfactory soil materials are defined as those complying with ASTM D 2487 soil classification Groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.

C. Bedding: MDOT Specification Granular Material 6A or Class I, except 100 percent must pass 1-1/2-inch sieve.

D. Bedding for Thermoplastic Pipe, 6-inch Diameter or Less: Granular material with 100 percent passing the 1/2-inch sieve and less than 50 percent passing the No. 200 sieve.

E. Granular Backfill: MDOT Specifications - Granular Materials Class III.

F. Stone Refill: MDOT 6A Coarse Aggregate.

G. Subbase Material: MDOT Specifications - Granular Materials Class II.

H. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100 percent passing a 1-1/2-inch sieve and not more than 5 percent passing a No. 4 sieve.

I. Backfill and Fill Materials: Satisfactory soil materials free of clay, rock, or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

PART 3 - EXECUTION

3.01 LIMITS OF EXCAVATION

A. Trenches for pipes shall be excavated so that there shall be a minimum clearance of 6 inches on each side of the pipe barrel, and a maximum width at the level on the top of the pipe of not more than O.D. of the pipe, plus 12 inches on each side. Trenches shall be at all times of sufficient width to permit the pipe to be laid by first-class construction methods. Sufficient space shall be provided in the trench to permit the joints to be properly made. Before excavation is started in either bituminous or concrete paved streets, the paving shall be cut by means specified under this Section.

B. The bottom of the trench in granular material shall be loosened to a depth of 4 inches below bottom of the pipe. Where the trench excavation for pipe is in rock, the trench bottom shall be undercut a minimum of 6 inches below the final location of the pipe and bedding material, herein specified, shall be placed and compacted along the haunch of the pipe.

C. Excavation for structures shall be made to the outside lines and surfaces of such structures wherever it is practicable to build directly against the sides or bottoms of excavations. In such cases, care shall be taken not to disturb the original foundation or backing, with the final excavation or trimming being done by hand work just before the construction Work. If excess excavation is made, or the material becomes disturbed so as to require removal beyond the prescribed limits, the resulting space shall be refilled with bedding, as specified in this Section, solidly machine tamped into place, to the required compaction, before construction work proceeds.

D. Excavation for structures shall be extended sufficiently beyond the limits of the structure to provide ample room for form construction and other construction methods to be followed, wherever necessary.

3.02 LENGTH OF TRENCH OPENING

A. In excavating for pipelines, the excavation shall at all times be finished to the required grade for an adequate distance in advance of the completed pipeline. Unless otherwise permitted by ENGINEER, not more than 50 feet of trench shall be open at one time in advance of the pipe. The length of the street which may be occupied by the construction work at any one time will be based on the requirements of use of the street by the public. No more than 600 consecutive feet of length of the street shall be occupied at one time, and vehicle traffic through the street shall not be entirely stopped without the permission of ENGINEER.

3.03 METHOD OF EXCAVATION IN EARTH

A. All excavation shall be by open cut from the surface, except in special cases where tunneling under pavement or structures may be required or where tunneling under the root system shall be required for tree root protection. All excavation shall be made in such a manner and to such depth, length, and width as shall give ample room for building the structures, for bracing, sheeting, and supporting the sides of the excavation, for pumping and drainage of groundwater and sewage which may be encountered, and for the removal of all materials excavated. Special care shall be taken so that the soil below the bottom of structures to be built shall be left undisturbed to provide a firm bed for construction.

3.04 STABILITY OF EXCAVATIONS

A. Comply with local codes, ordinances, and requirements of agencies having jurisdiction.

B. Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

3.05 STORAGE OF EXCAVATED MATERIALS

A. Stockpile excavated materials acceptable for backfill and fill where directed. Place, grade, and shape stockpiles for proper drainage.
   1. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.
   2. Dispose of excess excavated soil material and materials not acceptable for use as backfill or fill.

3.06 BEDDING

A. Place specified bedding materials under the pipe, in the haunches along the sides of the pipe, and over the pipe to a level 1 foot above the pipe. The material directly below the pipe shall be compacted. The material in the haunch area shall be placed in layers not to exceed 6 inches in depth, and shall be compacted to 95 percent of its maximum unit weight. The material placed above the haunch area shall be compacted to percentage maximum unit weight as specified in this Section under "Compaction."

3.07 BACKFILLING TRENCHES

A. All trenches in paved streets, shoulders, traveled roadways, parking areas, and driveways shall be backfilled with site-excavated backfill or granular fill, as shown on Drawings, from the level 1 foot above the top of the pipe to the specified road surface subgrade. The site-excavated backfill or granular fill shall be placed in not more than 6-inch layers and thoroughly and uniformly compacted by machine tamping to required compaction. With the approval of ENGINEER, water jetting on granular fill may be accepted in lieu of tamping in 6-inch layers.

B. Trenches under concrete sidewalks shall be backfilled from a level 1 foot above the top of the pipe to a level 4 inches below the finished grade of the sidewalk with site-excavated backfill or granular fill and compacted to the required density.

C. Trenches not in paved streets, shoulders, traveled roadways, parking areas, driveways, and under sidewalks shall be backfilled from a level 1 foot above the top of the pipe to the ground surface with site-excavated backfill and tamped as required to prevent trench settlement.

D. Any depression resulting from settlement of the trench backfill previous to the date of total acceptance of all Work under this Contract shall be brought to proper grade and surface and made to match the adjacent surface.

E. Wherever gas mains, water mains, sewers, etc., are located in the trench area, granular fill shall be used for backfill from the bottom of the trench up to the spring line of these pipes. Granular fill shall be placed full trench width with two horizontal to one vertical side slopes, and compacted in 6-inch layers to 95 percent of its maximum unit weight so as to thoroughly support the pipe within the trench area. Granular fill so required shall be considered included in the unit prices bid for other items of the Work. When directed by ENGINEER, dry mix Class "C" concrete shall be substituted for granular fill. The installation of any dry mix Class "C" concrete will be considered a Change in Work.

3.08 STONE REFILL

A. In locations where the soil at the bottom of the trench is unstable, when ordered by ENGINEER, CONTRACTOR shall excavate below the trench bottom and replace excavated material with stone refill.

3.09 BACKFILLING AROUND STRUCTURES

A. As soon as practical after concrete structures have set, forms and debris shall be removed and the surface of the concrete pointed. After the structure has been inspected and approved, the excavated area around the structure shall be backfilled up to the specified subgrade with granular fill or site-

excavated backfill, as called for on Drawings for the adjacent trench. The fill shall be made in layers not to exceed 6 inches in depth and thoroughly compacted by machine tamping. No large boulders or masonry shall be placed in backfilling. No backfilling will be placed against manhole walls within 24 hours after the plaster coat has been applied to the outside of the walls, nor shall backfilling be placed about concrete structures until the concrete has attained at least 75 percent of its design strength and approval of ENGINEER has been obtained.

3.10 CONCRETE CUTS

A. When the trench must be cut through pavement, driveway, or sidewalk, particular care shall be taken not to unnecessarily damage the adjoining areas of pavement, driveway, or sidewalk. All cuts through existing surfaces shall be made with a concrete saw, sawing deep enough to allow a straight cut parallel to longitudinal or transverse construction or contraction joints.

B. The saw cuts shall not be nearer than 5 feet to a transverse joint, to the centerline of the pavement, or to the edge of pavement or curb, i.e., no replacement shall be less than 5 feet in width. If the damaged pavement is nearer than 5 feet to a joint, to the centerline of pavement, or to the edge of pavement, surfacing or curb, the removal and replacement shall be extended to said joint, centerline, edge of pavement, surfacing or curb. These same requirements with reference to existing joints shall also apply to the cutting and replacement of concrete driveways.

C. If a square or block of sidewalk is cut, broken or cracked, the entire block or square shall be removed and replaced.

3.11 CROSSING EXISTING STRUCTURES

A. During construction, it may be necessary to cross under certain sewers, drains, culverts, water lines, gas lines, electric conduits, and other underground structures. Every effort shall be made to prevent damage to such underground structures. Wherever such structures are disturbed or broken, they shall be restored to good condition by CONTRACTOR unless otherwise noted on Drawings.

3.12 COMPACTION

A. Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages of maximum density, in accordance with ASTM D 1557:
   1. Under pavements, structures, and slabs, compact top 12 inches of subgrade and each layer of backfill or fill material at 95 percent maximum unit weight.
   2. Under lawn or unpaved areas, compact top 6 inches of subgrade and each layer of backfill or fill material at 90 percent maximum unit weight.
   3. Under walkways, compact top 6 inches of subgrade and each layer of backfill or fill material at 95 percent maximum unit weight.

B. Moisture Control: Where subgrade or layer of soil material must be moisture-conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material. Apply water in minimum quantity as necessary to prevent free water from appearing on surface during or subsequent to compaction operations.
   1. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

3.13 DISPOSAL OF EXCAVATED MATERIAL

A. Excavated material, where suitable, shall be used in backfilling around pipelines and structures. All material in excess of the quantity required for backfilling or unsuitable material shall be disposed of by CONTRACTOR. CONTRACTOR shall obtain such spoil sites as may be required, except that ENGINEER may direct CONTRACTOR to dump materials at any site designated by OWNER within a 2-mile radius of Work area. CONTRACTOR shall provide all labor and equipment for

spreading such material at the place of dumping, and shall leave the area in a neat condition satisfactory to ENGINEER.

3.14 TREE ROOT PROTECTION

A. Machines shall freely excavate no closer to the base of a tree than the radius of the tree in inches converted to feet for trees less than 24 inches in diameter, and no closer than 12 feet if the tree is more than 24 inches in diameter. Tunneling under the root system will be required between the points so determined. Approaches closer than the previously stated distance, or tree removal, may be authorized by ENGINEER. Trees removed shall be disposed of at CONTRACTOR's expense.

3.15 ROADSIDE DITCHES AND CULVERTS

A. All roadside ditches and driveway culverts shall be cleaned, repaired, and replaced to the same condition, or better, as existed before trenching operations commenced. Repair and/or replacement costs shall be included in other portions of the Work unless otherwise noted on Drawings.

3.16 FIELD QUALITY CONTROL

A. Quality Control Testing during Construction: Allow testing service to inspect and approve each subgrade and fill layer before further backfill or construction work is performed.

3.17 EROSION CONTROL

A. Provide erosion control methods in accordance with details shown on Drawings and/or requirements of authorities having jurisdiction.

3.18 MAINTENANCE

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

B. Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.

C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.

D. Settling: Where settling is measurable or observable at excavated areas during general Project warranty period, remove surface (pavement, lawn, or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

END OF SECTION

SECTION 02 63 50 - MANHOLES AND CATCH BASINS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Labor, materials, and equipment necessary for furnishing the fabrication, production, installation, or erection of manholes and catch basins including inlets as detailed on Drawings and at the locations shown on Drawings. Concrete, excavation, and backfill shall be as specified here. Manholes and catch basins shall be complete with frames, covers, and steps. Adjustment of frames, inlets, etc., on new manholes and catch basins to meet new or existing pavement surfaces or sidewalks shall be included in Work under this Section.

1.02 REFERENCES

A. Reference Standards:
   1. ASTM A 48 Gray Iron Castings.
   2. ASTM A 536 Ductile Iron Castings.
   3. ASTM C 55 Concrete Building Brick.
   4. ASTM C 76 Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
   5. ASTM C 139 Concrete Masonry Units for Construction of Catch Basins and Manholes.
   6. ASTM C 443 Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
   7. ASTM C 472 Test Method for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Concrete.
   8. ASTM C 478 Precast Reinforced Concrete Manhole Sections.
   9. ASTM C 923 Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes.

1.03 SUBMITTALS

A. Shop Drawings: Submit in accordance with Section 01 33 00, Shop Drawings covering the items included under this Section. Shop Drawing submittals shall include:
   1. Dimensions and reinforcement of precast concrete units, joint details, orientation and elevation of preformed openings in riser sections, pipe-to-manhole connection details, casting details, and certification papers.

B. Warranty: Submit in accordance with requirements of Section 01 77 00, warranties covering the items included under this Section.

C. Quality Control Submittals: All precast concrete manhole sections, resilient connectors between manhole sections and pipes and castings delivered to Site shall be preceded or accompanied by certification papers or stamped markings showing that the materials have been tested in accordance with applicable standard testing procedures and that the materials meet the Specifications for this Contract.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with specified requirements, manufacturers offering products which may be incorporated in Work include:
   1. Cast Iron Manhole Steps:
      a. James B. Clow and Sons.
      b. East Jordan Iron Works.
      c. Neenah Foundry Co.
   2. Steel-Reinforced Manhole Plastic Steps:
      a. Cast-in-Place:
         1) M.A. Industries, Inc. PS1-PF.
         2) American Step Co., Inc. P1-10.
      b. Masonry:
         1) M.A. Industries, Inc. PS1-B.
         2) American Step Co., Inc. MSN-10.
      c. Mechanical Lock:
         1) M.A. Industries, Inc. PS1-PF.
         2) American Step Co., Inc. ML-10.
   3. Frames and Covers:
      a. James B. Clow and Sons.
      b. East Jordan Iron Works.
      c. Neenah Foundry Co.

2.02 CATCH BASINS

A. Catch basins shall be constructed of precast reinforced concrete units. These precast units shall conform to the requirements of ASTM. Inside grouting with either cold-applied, ready-to-use plastic joint-sealing compound or rubber gasket shall be used to connect the units.
   1. As an alternate, the use of concrete manhole block conforming to ASTM will be permitted. If block is used, a mortar coating shall be applied the same as with masonry construction of manholes.

B. If noted on Drawings, catch basins shall be constructed with sumps.

C. Foundations shall be constructed as a cast-in-place concrete slab according to details given on Drawings or precast reinforced concrete base slabs as specified under Manholes.

2.03 FRAMES AND COVERS

A. Cast iron frames and covers shall be furnished and placed on each manhole by CONTRACTOR. Casting materials shall conform to ASTM A 48, Class 30 or better for gray iron, or ASTM A 536 for ductile iron. Casting shall be free of defects and shall be smooth and well cleaned by shot blasting. Castings shall be of the size and type as called for on Drawings. Lids shall be self-sealing on all sanitary sewer manholes. Castings shall be set flush with sidewalk, pavement, or ground surface and shall be securely cemented in place. In gravel streets, covers shall be set 4 inches below the surface.

B. Where noted on Drawings, bolted gasketed frames and covers shall be provided. The frames shall be anchored to the concrete manhole sections according to details shown on Drawings.

PART 3 - EXECUTION

3.01 EXCAVATION AND BACKFILL

A. Excavation and backfill shall be in accordance with Section 02 31 50.

B. The excavation shall be of sufficient dimensions to provide ample space for sheeting and bracing where sheeting and bracing are required, and ample space to perform Work in a satisfactory manner.

C. When the earth at the normal depth of the structure is unsuitable for a foundation for the structure, such unsuitable materials shall be removed as required by ENGINEER and replaced with MDOT Class II material.

3.02 BEDDING

A. Precast base section shall be placed on a well-graded granular bedding course conforming to the requirements for sewer bedding, but not less than 4 inches in thickness and extending to the limits of the excavation. The bedding course shall be firmly tamped and made smooth and level to ensure uniform contact and support of the precast element.

3.03 PLACING OF CASTINGS, GRADE RINGS, AND TOP SECTIONS

A. Castings placed on concrete surface shall be set in full mortar beds. The mortar shall be mixed in proportion of 1 part Portland cement to 2 parts sand, by volume, based on dry materials. Castings shall be set accurately to the finished elevation so that no subsequent adjustment will be necessary, or unless otherwise specified by ENGINEER.

B. Where Work is in paved streets or areas which have been brought to grade, not more than 15 inches shall be provided between the top of the cone or slab and the underside of the manhole casting for adjustment of the casting to street grade.

C. Where Work is in unpaved streets or alleys, provide not less than 12 inches of adjusting rings between the top of the cone or slab and the underside of the manhole casting for adjustment of the casting to finished grade. Set the top of the manhole casting 5 inches below finished grade, unless otherwise directed by ENGINEER.

D. Where Work is in cultivated agricultural areas, bury the top of the manhole casting 3 feet, and in noncultivated areas, set the casting flush with the finished grade, unless otherwise directed by ENGINEER.

E. Where the last manhole section is a reducing cone and it is set to final grade as required by ENGINEER, if as part of the continuous Work it becomes necessary to lower this casting and the adjustment entails going below the cone, compensation to CONTRACTOR will be allowed for said adjustment and changing of the manhole stacks.

F. Point up and make watertight adjusting rings used to set the casting to grade.

3.04 PIPE CONNECTIONS

A. Make pipe-to-manhole connections on sanitary sewers with properly sized watertight resilient connector. Fill other pipe joints firmly full of jointing materials to ensure watertightness. The pipes shall not protrude into the inside face of the manhole, measured along the horizontal center of the pipe unless the pipe is placed through the entire diameter of the manhole.

B. Use rubber water stops, O-ring gaskets, or poured-in-place pipe sleeves for watertightness between the pipe and manhole. Core drill or star drill new holes in a circle of the required diameter. In no instance shall new holes be sledge hammered out.

3.05 REMOVALS, REPLACEMENTS, AND MODIFICATIONS

A. Remove existing manholes where indicated on Drawings or as directed by ENGINEER. Remove frame and cover and deliver to OWNER. Bulkhead all abandoned pipes and either remove the manhole and backfill the area as specified under "Excavation and Backfill," or, if in good condition, remove to a depth of 24 inches below grade and fill with granular fill materials.

B. Remove existing catch basins where indicated on Drawings or as directed by ENGINEER. Remove frame and cover and deliver to OWNER. Completely break up masonry, or pipe, and remove and dispose. Bulkhead all abandoned pipe connections at both ends where accessible. Backfill the area occupied by existing catch basins after their removal as specified under Section 02 31 50.

C. Where indicated on Drawings and/or as directed by ENGINEER, fit existing catch basins to be retained with a new frame and cover of the type noted on Drawings including all necessary work required to adjust to grade. Where indicated on Drawings or as directed by ENGINEER, fillet existing sumps with Class C concrete and bulkhead abandoned leads. Work shall be considered incidental to construction of the new catch basin lead.

D. Where noted on Drawings and/or as directed by ENGINEER, remove existing manhole and/or catch basin castings and replace with a new casting as specified here before.

END OF SECTION

SECTION 02 80 50 - RESTORATION WORK

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Work including the replacement of all permanent type roadway bases and surfaces, concrete sidewalks, curbs and gutters, trees, lawns, and driveways damaged or removed due to the construction of the pipe and appurtenant structures. All such Work shall be in accordance with the Best Modern Practice, OWNER's standards, and/or as specified herein.

B. Related Documents: Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1, apply to Work of this Section.

1.02 REFERENCES

A. MDOT Standard Specifications for Construction, 2012 Edition:
   1. 302 Aggregate Base Course.
   2. 306 Aggregate Surface Course.
   3. 501 Plant Mixed Hot Mix Asphalt.
   4. 502 Hot Mix Asphalt Construction Practices
   5. 902 Aggregates

1.03 SUBMITTALS

A. Shop Drawings: Submit in accordance with Section 01 33 00, Shop Drawings covering the items included under this Section. Shop Drawing submittals shall include:
   1. Material Certificates: Provide copies of materials certificates signed by materials producer and CONTRACTOR, certifying that each materials item complies with or exceeds specified requirements.

B. Warranty: Submit in accordance with requirements of Section 01 77 00, warranties covering the items included under this Section.

1.04 QUALITY ASSURANCE

A. Certification: CONTRACTOR shall submit certificates of compliance with applicable MDOT Standard Specifications.

1.05 SITE CONDITIONS

A. Weather Conditions: Construct asphalt concrete surface course when atmospheric temperature is above 40 degrees F (4 degrees C), and when base is dry. Bituminous base course over 2 inches thick may be placed when air temperature is above 35 degrees F (-1 degree C) and rising. Asphalt may not be placed between November 15 and May 5.

1.06 WARRANTY

A. Special Warranty: Provide, in accordance with Section 01 77 00, warranties covering the items included under this Section.
   1. Warranty Period: 1 year from the time of planting.
   2. This warranty includes furnishing new plants as well as labor and materials for installation of replacements. Replacement plantings shall meet or exceed all requirements for original plant materials as specified herein.
   3. CONTRACTOR shall not assume responsibility for damages or loss of plants or trees caused by fire, flood, lightning storms, freezing rains, winds over 60 miles per hour, or vandalism.

PART 2 - PRODUCTS

2.01 AGGREGATE BASE

A. Aggregate base shall be constructed with not less than 12 inches of compacted aggregate placed in two 6-inch layers. Aggregate base shall meet requirements of MDOT Specification for 21A or 22A aggregate. Aggregate base shall extend beyond pavements to match existing aggregate or a minimum of 24 inches.

2.02 BITUMINOUS PAVEMENT

A. Bituminous pavement shall be 3 inches, MDOT 3C leveling course over aggregate base with 1.5 inches, MDOT 5C, wearing course.

B. Bituminous mixtures shall be furnished and placed in accordance with MDOT Specifications.

2.03 CONCRETE CURB AND GUTTER

A. Concrete curb and gutter to be replaced shall have the same cross-section as that removed, or as shown on Drawings, using Class P concrete and in accordance with OWNER's standards.

2.04 CONCRETE SIDEWALKS

A. Concrete sidewalks shall be replaced with walks 4 inches thick (8 inches thick at driveway crossings) and to the same width as the existing walks. Concrete shall be Class B.

2.05 SEEDING

A. Seeding shall be the following type:
   1. Sodded Shoulders, Slope Area, or Flat Field: 4 inches of topsoil, 20 pounds of 10-6-4 commercial fertilizer per 1,000 square feet of area, and 5 pounds of MDOT THM mixture per 1,000 square feet of area.

PART 3 - EXECUTION

3.01 COORDINATION OF WORK

A. Type of restoration shall be as noted on Drawings regardless of existing surface.

B. The placing of base and surface courses shall follow immediately after backfilling the trench Any material placed in the trench other than that specified shall be considered as a temporary surface and shall be removed.

C. All utilities, such as catch basins, manhole castings, water valve boxes, etc., shall be adjusted prior to installation of new pavement so that the finished surface will meet such utilities smoothly when surfacing is completed.

3.02 SAW CUT JOINTS

A. Damaged areas shall be removed by sawing a straight-cut parallel with longitudinal and transverse construction or contraction joints. No saw cuts shall be nearer than 5 feet to a longitudinal or transverse joint or to the edge of the pavement. If the damaged area is less than 5 feet from an existing joint, the existing surface shall be saw-cut 5 feet from the damaged area, removed, and replaced. If the damaged area is less than 5 feet from the edge of the pavement, the removal and replacement shall be extended to said edge of pavement.

B. Saw cutting of concrete shall be done with a carborundum saw to a minimum depth of half the slab thickness or that depth required to cut reinforcing steel. Bituminous surfaces shall be cut full depth.

C. After the trench is backfilled and before the pavement over the trench is replaced, all angular and ragged irregularities on the edges of the cut pavement shall be removed giving a smooth and regular edge of pavement. Payment for cut joints required shall be included under the unit price of pavement restoration.

3.03 EXCAVATION

A. Before repaving is started, all trenches and area around structures shall be excavated or backfilled to the level of the subgrade as required by the type of pavement replacement and cross-section specified. All existing pavement that has been undercut by the excavation for the pipe or structures shall be removed. The finished subgrade shall be smoothed, trimmed, and compacted to the required grade and cross-section. Compaction of the finish subgrade shall be obtained by suitable means approved by ENGINEER.

3.04 AGGREGATE BASE

A. Place aggregate base on a prepared subbase or subgrade in accordance with construction methods described in Section 302 of MDOT Specifications.

3.05 BITUMINOUS PAVEMENTS

A. Pavement surfaces shall be replaced with bituminous concrete of the type and in locations shown on Drawings. Work shall consist of saw cutting existing surfaces as herein specified under Saw Cut Joints, conditioning and treating the base course with prime or bond material and constructing

thereon a bituminous concrete surface consisting of mineral aggregate, mineral filler, and bituminous material combined by a plant hot mix method per MDOT Specification. Construction methods and equipment for placing bituminous materials shall be as specified in MDOT Standard Specifications.

B. Pavement surfaces shall be replaced to match existing widths, but new pavements shall not be less than 22 feet wide.

C. Conditioning of Base: Bituminous base shall be treated with a bond coat applied at the rate of 0 - 0.10 gallon per square yard. Bond coat shall be SS-1h or MS-2a.

D. Leveling Course: Bituminous leveling course mixture shall be placed in one or more layers to the cross-section shown on Drawings. When the total application rate exceeds 220 pounds per square yard, the leveling course shall be applied in 2 courses. A bond coat shall be applied at the rate of 0 - 0.10 gallon per square yard between courses.

E. Wearing Course: Following completion of the leveling course or courses, the surface shall be treated with a bond coat of 0 - 0.10 gallon per square yard. The wearing course mixture shall be placed according to the cross-section shown on Drawings in one or more courses as required.

F. All joints in the bituminous pavements shall be vertical joints. Where the joints are allowed to set before the adjoining pavement is placed, such joints shall be treated with bond coat material.

G. Feathering to connect new pavement to an existing pavement will not be allowed.

3.06 CONCRETE CONSTRUCTION

A. Curb and Gutter: Concrete curb and gutter shall be placed prior to the placement of other types of roadway surfaces including concrete pavements.
   1. Curb and gutter to be replaced shall be determined by ENGINEER and shall include any cracked or broken sections and any sections which have settled 0.25 inch or more.
   2. Forms shall be complete front and back type. Back forms resulting in hand forming the curb and gutter will not be allowed. Forms shall be of metal, straight and free of distortion and of sufficient strength to resist springing during the placing of concrete. Forms shall be securely staked, braced, and tied to the required line and grade. Flexible steel or adequately sized lumber may be used for short radius forms.
   3. One-inch expansion joints shall be placed opposite expansion joints in an abutting pavement. If curb or curb and gutter do not abut a concrete pavement, place expansion joints at all spring lines of street returns.
   4. If the structure does not abut a concrete pavement or base, contraction joints shall be placed at approximately 100-foot intervals.
   5. Intermediate plane of weakness joints shall be placed at approximately 10-foot intervals between other joints as called for above.
   6. Curb returns and curb cuts for driveways shall be installed as required.
   7. The gutter and top of curb shall not vary more than 3/16 inch in 10 feet when checked with a 10-foot straightedge.
   8. After the back forms are removed, honeycomb and minor defects shall be filled with mortar, composed of 1 part Portland cement and 2 parts sand.
   9. As soon as concrete surfaces have hardened sufficiently to prevent marring, they shall be covered by an approved curing compound, or they shall be thoroughly wetted and cured by an approved method for a period of 6 days unless otherwise directed by ENGINEER.

B. Sidewalks: Forms shall be of metal or wood, straight and free of distortion, and of sufficient strength to resist springing during the placing of concrete. Forms shall be securely staked, braced, and tied to the required line and grade. Flexible steel or adequately sized lumber may be used for short radius forms.
   1. The walk subgrade shall be compacted to 95 percent compaction by tamping. After wetting the subgrade, the concrete shall be placed to the proper depth and spaded along the form faces.
   2. Concrete shall be alternately tamped and screeded until all voids are removed and the surface has been brought to the required grade. The surface shall then be floated to produce a smooth, dense surface, free from irregularities. All edges and joints shall be rounded to a radius of 1/4 inch with an edging tool and trowel. As soon as all excess moisture has disappeared, the surface shall be finished by light brooming.
   3. Walks shall be divided into blocks approximately square, using slab division forms or by cutting joints after floating. These joints shall be 1/2-inch-deep by 1/8- to 1/4-inch in width, and shall be finished smooth and true to line. Bituminous expansion joints shall be provided at intervals of 50 feet and at junctions with structures and curbs. Control joints shall be located between expansion joints at intervals equal to the sidewalk width.
   4. As soon as concrete surfaces have hardened sufficiently to prevent marring, they shall be covered by an approved curing compound, or they shall be thoroughly wetted and cured by an approved method for a period of 6 days unless otherwise directed by ENGINEER.

3.07 SEEDING

A. Wherever the pipe trench passes through an area to be seeded, the backfilling shall be carried up to the surface except the top 4 inches, which shall be selected topsoil preserved or secured elsewhere for this purpose. This topsoil shall be rich, black surface earth, free from sod, weed stalks, or debris. The trench surface shall be carefully raked to an even surface, and all stones, sticks and other debris removed therefrom.

B. Seeded areas shall receive a proper mulch of chopped straw, jute matting, or woven Kraft paper yarn. Seed shall not be sown between June 15 and August 15, or between October 15 and April 15, or at any time when the soil has insufficient moisture to ensure proper germination, or CONTRACTOR shall provide sufficient application of water by sprinkling until a growing catch of grass is established.

3.08 RECONDITIONING EXISTING LAWNS

A. Recondition existing lawn areas damaged by CONTRACTOR's operations including storage of materials and equipment and movement of vehicles. Also recondition existing lawn areas where minor regrading is required.

B. Provide fertilizer, seed or sod, and soil amendments as specified for new lawns, and as required, to provide a satisfactorily reconditioned lawn.

C. Provide new topsoil, as required, to fill low spots and meet new finish grades.

D. Cultivate bare and compacted areas thoroughly to provide a satisfactory planting bed.

E. Remove diseased and unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from CONTRACTOR's operations, including oil drippings, stone, gravel, and other loose building materials.

F. Where substantial lawn remains but is thin, mow, rake, aerate if compacted, fill low spots, remove humps, and cultivate soil, fertilize, and seed. Remove weeds before seeding, or if extensive, apply selective chemical weed killers as required. Apply a seedbed mulch, if required, to maintain moist condition.

G. Water newly planted lawn areas and keep moist until new grass is established.

3.09 PROTECTION

A. Protection and Maintenance: CONTRACTOR shall assume responsibility for maintaining CONTRACTOR's Work to the end of the guarantee period. During this period, CONTRACTOR shall make a minimum of 1 maintenance trip every 4 weeks during the growing season, and as many more as necessary to keep the plantings in a thriving condition.
   1. Maintenance of plants shall consist of pruning, cultivating, weeding, watering, keeping guying taut and trees erect, raising tree balls which settle below grade, and providing such sprays as are necessary to keep the planting free of insects and diseases.

B. Acceptance: At the end of the warranty period, final acceptance will be made by ENGINEER and OWNER, provided all requirements of the Specifications have been fulfilled.
   1. Inspection of the plantings will be made jointly by CONTRACTOR and ENGINEER at completion of planting. All plants not in a healthy growing condition shall be removed and replaced with plants of like kind, size, and quality as originally specified before close of next planting season.

END OF SECTION

SECTION 02 83 00 - CHAIN-LINK FENCING AND GATES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Galvanized steel chain-link fabric.
   2. Aluminum-coated steel chain-link fabric.
   3. Galvanized steel framework.

1.02 SUBMITTALS

A. Shop Drawings: Submit in accordance with Section 01 33 00, Shop Drawings covering the items included under this Section. Shop Drawing submittals shall include:
   1. Product Data: Submit manufacturer's technical data, and installation instructions for metal fence framing, fabric, gates, and accessories.

1.03 QUALITY ASSURANCE

A. Provide chain-link fences and gates as complete units controlled by a single source, including necessary erection accessories, fittings, and fastenings.

PART 2 - PRODUCTS

2.01 GENERAL

A. Dimensions indicated for pipe, roll-formed, and H-sections are outside dimensions, exclusive of coatings.

2.02 MANUFACTURERS

A. Subject to compliance with specified requirements, manufacturers offering products which may be incorporated in Work include:
   1. Galvanized Steel Fencing and Fabric:
      a. Allied Tube and Conduit Corp.
   2. Aluminized Steel Fencing and Fabric:
      a. Cyclone Fence/United States Steel Corp.
      b. Page Fence Division/Page-Wilson Corp.
   3. Barbed Tape:
      a. American Fence Corp.
      b. Man Barrier Corp.

2.03 STEEL FABRIC

A. Fabric: No. 9 gauge (0.148 inch plus or minus 0.005 inch) finished size steel wires, 2-inch mesh with top selvages twisted and barbed and bottom selvages knuckled.
   1. Provide one-piece fabric widths for fencing up to 12 feet high.

2. Fabric Finish: Aluminized, ASTM A 491, Class II, with not less than 0.40 ounces aluminum per square foot of fabric, or zinc-coated ASTM A 817, Type II, Class 2, with not less than 2.0 ounces per square foot of fabric.
3. CONTRACTOR to verify fabric coating and color and match existing.

2.04 FRAMING AND ACCESSORIES

A. Steel Framework, General: Galvanized steel, ASTM F 1083, with not less than 1.8-ounce zinc per square foot of surface.
   1. Fittings and Accessories: Galvanized, ASTM A 153, with zinc weights per Table I.
   2. Fittings and Accessories: Mill finished aluminum or galvanized steel, to suit manufacturer's standards.

B. End, Corner, and Pull Posts: Minimum sizes and weights as follows:
   1. Up to 6 feet fabric height, 2.375 inches outside diameter (O.D.) steel pipe, 3.65 pounds per linear foot, or 3.5-inch by 3.5-inch roll-formed sections, 4.85 pounds per linear foot.
   2. Over 6 feet fabric height, 2.875 inches O.D. steel pipe, 5.79 pounds per linear foot, or 3.5-inch by 3.5-inch roll-formed sections, 4.85 pounds per linear foot.

C. Line Posts: Space 10 feet o.c. maximum, unless otherwise indicated, of following minimum sizes and weights.
   1. Up to 6-foot fabric height, 1.90-inch O.D. steel pipe, 2.70 pounds per linear foot or 1.875-inch by 1.625-inch C-sections, 2.28 pounds per linear foot.
   2. 6- to 8-foot fabric height, 2.375-inch O.D. steel pipe, 3.65 pounds per linear foot or 2.25-inch by 1.875-inch H-sections, 2.64 pounds per linear foot.
   3. Over 8-foot fabric height, 2.875-inch O.D. steel pipe, 5.79 pounds per linear foot or 2.25-inch by 1.875-inch H-sections, 3.26 pounds per linear foot.

D. Cantilevered Slide Gate Posts:
   1. For Gate Openings under 31’-0” (9,449 mm): Galvanized steel 4-inch (101.6 mm) O.D., Schedule 40 pipe, ASTM F 1083, weighing 9.1-pound per foot (13.6kg/m). Provide 1 latch post and 2 support posts for single slide gates, and 4 support posts for double slide gates.
   2. For Gate Openings 31’-0” (9,449 mm) or larger, 2 pairs of support posts for each leaf (dual) 4-inch (100 mm) O.D., Schedule 40 pipe, ASTM F 1083, weighing 9.1 pounds per foot (13.6 kg/m) each. Posts connected by welding 6-inch by 3/8-inch (12.7 by 9.5 mm) plate between posts as shown on Drawings. Also one 4-inch (100 mm) latch post.

E. Top Rail: Manufacturer's longest lengths, with expansion type couplings, approximately 6 inches long, for each joint. Provide means for attaching top rail securely to each gate, corner, pull and end post.
   1. 1.66-inch O.D. pipe, 2.27 pounds per foot or 1.625-inch by 1.25-inch roll-formed sections, 1.35 pounds per foot.

F. Tension Wire: 7-gauge coated coil spring wire, metal and finish to match fabric.
   1. Locate at bottom of fabric.

G. Post Tops: Provide weathertight closure cap with loop to receive tension wire or toprail, one cap for each post.

H. Stretcher Bars: One-piece lengths equal to full height of fabric with minimum cross-section of 3/16 inch by 3/4 inch. Provide 1 stretcher bar for each gate and end post, and 2 for each corner and pull post, except where fabric is integrally woven into post.

I. Stretcher Bar Bands: Space not over 15 inches o.c. to secure stretcher bars to end, corner, pull, and gateposts.

J. Barbed Wire Supporting Arms: Manufacturer's standard barbed wire supporting arms, metal and finish to match fence framework, with provision for anchorage to posts and attaching 3 rows of barbed wire to each arm. Supporting arms may be either attached to posts or integral with post top weather cap, and must be capable of withstanding 250 pounds downward pull at outermost end. Provide following type:
   1. Single 45-degree arm for 3 strands barbed wire, one for each post.

K. Barbed Wire: 2-strand, 12-1/2-gauge wire with 14-gauge, 4-point barbs spaced not more than 5 inches o.c.; aluminum coated steel wire.

2.05 GATES

A. Fabricate perimeter frames of gates from metal and finish to match fence framework. Assemble gate frames by welding, providing security against removal or breakage connections. Provide horizontal and vertical members to ensure proper gate operation and attachment of fabric, hardware, and accessories. Space frame members maximum of 8 feet apart unless otherwise indicated.
   1. Provide same fabric as for fence, unless otherwise indicated. Install fabric with stretcher bars at vertical edges and at top and bottom edges. Attach stretcher bars to gate frame at not more than 15 inches o.c.
   2. Install diagonal cross bracing consisting of 3/8-inch diameter, adjustable length truss rods on gates to ensure frame rigidity without sag or twist.
   3. Where barbed wire is indicated above gates, extend end members of gate frames 1'-0" above to member and prepare to receive three strands of wire. Provide necessary clips for securing wire to extensions.

B. Cantilevered Sliding Gates: Comply with ASTM F 1184.

C. Type II, Cantilever: Manufacturer’s standard top rail gate incorporating a track for the top roller. Brace frame to prevent sagging and apply fabric to entire gate. Provide a lockable positive latch and other hardware and accessories as required.
   1. Class 2: Provide internal rollers with sealed lubricant ball bearings

D. Contractor shall provide a locking mechanism on the gate and a padlock, which will become property of the Owner.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Do not begin installation and erection before final grading is completed unless otherwise permitted.

B. Excavation: Drill or hand excavate (using post hole digger) holes for posts to minimum diameter recommended by fence manufacturer, but not less than 4 times largest cross-section of post and spacings indicated, in firm, undisturbed or compacted soil.
   1. Unless otherwise indicated, excavate hole depths approximately 3 inches lower than post bottom, with bottom of posts set not less than 36 inches below finish grade surface.

C. Setting Posts: Center and align posts in holes 3 inches above bottom of excavation.
   1. Place concrete around posts and vibrate or tamp for consolidation. Check each post for vertical and top alignment and hold in position during placement and finishing operations.
   2. Unless otherwise indicated, extend concrete footings 2 inches above grade and trowel to a crown, to shed water.

D. Top Rails: Run rail continuously through post caps, bending to radius for curved runs. Provide expansion couplings as recommended by fencing manufacturer.

E. Brace Assemblies: Install braces so posts are plumb when diagonal rod is under proper tension.

F. Tension Wire: Install tension wires through post cap loops before stretching fabric, and tie to each post cap with not less than 6-gauge galvanized wire. Fasten fabric to tension wire using 11-gauge galvanized steel hog rings spaced 24 inches o.c.

G. Fabric: Leave approximately 2 inches between finish grade and bottom selvage, unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Install fabric on security side of fence and anchor to framework so that fabric remains in tension after pulling force is released.

H. Stretcher Bars: Thread through or clamp to fabric 4 inches o.c. and secure to posts with metal bands spaced 15 inches o.c.

I. Barbed Wire: Pull wire taut and install securely to extension arms and secure to end post or terminal arms in accordance with manufacturer's instructions.

J. Gates: Install gates plumb, level, and secure for full opening without interference. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

K. Tie Wires: Use U-shaped wire, conforming to diameter of pipe to which attached, clasping pipe and fabric firmly with ends twisted at least two full turns. Bend ends of wire to minimize hazard to persons or clothing.
   1. Tie fabric to line posts, with wire ties spaced 12 inches o.c. Tie fabric to rails and braces, with wire ties spaced 24 inches o.c. Tie fabric to tension wires, with hog rings spaced 24 inches o.c.

L. Fasteners: Install nuts for tension bands and hardware bolts on side of fence opposite fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

END OF SECTION

SECTION 03 31 00 - CONCRETE WORK

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Labor, materials, and equipment necessary for fabrication, production, installation, and erection of items specified in this Section as shown on Drawings or listed on Schedules.

B. Related Documents: Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, including Section 01 60 00, apply to Work of this Section.

C. Products Installed but not Furnished under this Section:
   1. Anchor bolts.
   2. Miscellaneous metal embedments.

1.02 DEFINITIONS

A. Flowable Fill: Cement Stabilized Fly Ash Fill (CSFAF) consisting of cement, fly ash, and water. These Specifications classify this material as Class F mix.

B. Mass concrete refers to slabs or walls greater than 3 feet thick.

1.03 REFERENCES

A. AASHTO:
   1. Standard Specifications for Highway Bridges.
   2. Standard Specifications for Transportation Materials and Methods of Sampling and Testing.

B. ASTM:
   1. A 185 Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement.
   2. A 497 Welded Deformed Steel Wire Fabric for Concrete Reinforcement.
   3. A 615 Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
   4. C 31 Test Methods of Making and Curing Concrete Test Specimens in the Field.
   5. C 33 Concrete Aggregates.
   6. C 39 Test Method for Compressive Strength of Cylindrical Concrete Specimens.
   7. C 42 Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
   8. C 94 Ready-Mixed Concrete.
   9. C 143 Test Method for Slump of Hydraulic Cement Concrete.
   10. C 150 Portland Cement.
   11. C 157 Test Method for Length Change of Hardened Hydraulic Cement Mortar and Concrete.
   12. C 171 Sheet Materials for Curing Concrete.
   13. C 172 Practice for Sampling Freshly Mixed Concrete.
   14. C 173 Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
   15. C 231 Test Method for Air Content of Freshly Mixed Concrete by Pressure Method.
   16. C 260 Air-Entraining Admixtures for Concrete.
   17. C 309 Liquid Membrane-Forming Curing Compounds for Curing Concrete.

18. C 494 Chemical Admixtures for Concrete.
19. C 578 Preformed, Cellular Polystyrene Thermal Insulation.
20. C 595 Blended Hydraulic Cements.
21. C 618 Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
22. C 845 Expansive Hydraulic Cement.
23. C 881 Epoxy-Resin-Base Bonding Systems for Concrete.
24. C 989 Ground Iron Blast-Furnace Slag for Use in Concrete and Mortars.
25. C 1107 Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
26. C 1116 Fiber-Reinforced Concrete and Shotcrete.
27. C 1240 Silica Fume for Use as a Mineral Admixture in Hydraulic Cement Concrete.
28. D 994 Preformed Expansion Joint Filler for Concrete (Bituminous Type).
29. D 471 Test Method for Rubber Property – Effect of Liquids.
30. D 1751 Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextending and Resilient Bituminous Types).
31. D 1752 Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
32. D 3963 Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars.
33. E 1155 Test Method for Determining Floor Flatness and Levelness Using the F-Number System (Inch-Pound Units).
34. E 1643 Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
35. E 1745 Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.

C. CE:
1. CRD-C 572 PVC Waterstop.

D. MDOT: Standard Specifications for Construction.

E. ACI:
1. 211.1 Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
2. 222.1 Provisional Standard Test Method for Water-Soluble Chloride Available for Corrosion of Embedded Steel in Mortar and Concrete Using the Soxhlet Extractor.
3. 301 Specification for Structural Concrete.
4. 304R Guide for Measuring, Mixing, Transporting, and Placing Concrete.
5. 305R Hot Weather Concreting.
6. 306R Cold Weather Concreting.
7. 309R Guide for Consolidation of Concrete.
8. 318R Building Code Requirements for Structural Concrete and Commentary.
9. 347R Guide to Formwork for Concrete.
10. 350R Environmental Engineering Concrete Structures and Commentary.
11. 503R Use of Epoxy Compounds with Concrete.
12. SP-66 ACI Detailing Manual.

F. CRSI:
   1. Manual of Standard Practice.
   2. Placing Reinforcing Bars.

1.04 SUBMITTALS

A. Shop Drawings: Submit in accordance with Section 01 33 00, Shop Drawings covering the items included under this Section.

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. 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. Type, composition, and quantity of fly ash, slag (GGBFS), or silica fume.
   6. Unit weight (wet density).
   7. Composition strength based on 28-day compression test.

D. Quality Assurance Submittals:
   1. Submit written reports to ENGINEER documenting testing and inspection results. Prepare report as noted in Section 01 45 00.
   2. 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.

1.05 OWNER'S INSTRUCTIONS

A. Concrete Testing Service: Engage testing laboratories acceptable to ENGINEER to do material evaluation tests and to design concrete mixes.

B. Materials and installed Work may require testing and retesting at any time during progress of Work. Tests, including retesting of rejected materials for installed Work, shall be done at CONTRACTOR's expense.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with specified requirements, products which may be incorporated in Work include:
   1. Nonstructural Fiber Reinforcement:
      a. "Fibermesh," Propex Concrete Systems.
      b. "Fiberstrand F," Euclid Chemical Co.
      c. "Grace Fibers," Grace Construction Products.

2. Air-Entraining Admixture:
    a. "AEA-92" or "Air-Mix," Euclid Chemical Co.
    b. "Darex II AEA" or "Daravair 1000 or 1400," Grace Construction Products.
    c. "MB AE 90" or "Micro-Air," Master Builders.
3. Water-Reducing Admixture:
    a. "Eucon WR-75," Euclid Chemical Co.
    b. "Pozzolith 220-N," Master Builders.
    c. "WRDA with Hycol" or "Daracem," Grace Construction Products.
4. Mid-range Water-Reducing Admixture:
    a. "Eucon MR," Euclid Chemical Co.
    b. "Mira 70" or "Daracem 65 or 55," Grace Construction Products.
    c. "Polyheed 997," Master Builders.
5. High-range Water-Reducing Admixture (Superplasticizer):
    a. "ADVA," "Daracem," Grace Construction Products.
    b. "Eucon 37," Euclid Chemical Co.
    c. "Rheobuild 1000 or 7161," Master Builders.
6. Water Reducing, Nonchloride Accelerator Admixture:
    a. "Accelguard 80 or 90," Euclid Chemical Co.
    b. "Daraset," Grace Construction Products.
    c. "Pozzutec 20" or "Pozzolith NC 534," Master Builders.
7. Water Reducing, Retarding Admixture:
    a. "Daratard," Grace Construction Products.
    b. "Eucon Retarder 75," Euclid Chemical Co.
    c. "Pozzolith Retarder," Master Builders.
8. Epoxy Coating for Steel Reinforcing Bars:
    a. "Scotchkote," 3M.
    b. "Interpon HD," Akso Nobel Powder Coatings.
    c. "Nap-Gard," Dupont Powder Coating.
    d. "Corvel Green," Morton Powder Coating.
    e. "Greenbar," Valspar.
9. PVC Waterstops:
    a. Greenstreak, Inc.
    b. Vinylex Corp.
    c. W.R. Meadows.
10. Thermoplastic Elastomeric Rubber (TPER) Waterstops:
    a. Westec Barrier Technologies, Inc.
11. Bentonite Waterstops:
    a. "Swellstop Waterstop," Greenstreak, Inc.
    b. "Volclay Waterstop," Cetco-Colloid Environmental Technologies Co.
12. Hydrophilic Waterstop:
    a. "Akwastop Gasket Waterstop," Cetco-Colloid Environmental Technologies Co.
    b. "Swellseal," De Neef Construction Chemicals, Inc.
13. Expansion and Isolation Joint Filler:
    a. "Sealtight Sponge Rubber," W.R. Meadows.
    b. "1300 Series Sponge Rubber," Williams Products.

14. Expansion and Isolation Joint Sealant:
    a. "Dynaseal W-517 or 907," Williams Products.
    b. "Sonolastic NP1," Sonneborn.
    c. "Vulkem 45 or 116," Mameco International.
15. Vapor Retarder:
    a. Moisture Vapor-Sensitive Applications (Class C):
        1) "Sealtight Vapor-Mat (10 mil)," W.R. Meadows, Inc.
        2) "Stego Wrap Vapor Barrier (10 mil)," Stego Industries LLC.
        3) "VaporBlock 10," Raven Industries.
    b. Critical Moisture Vapor-Sensitive Applications (Class B):
        1) "Sealtight Vapor-Mat (15 mil)," W.R. Meadows, Inc.
        2) "Stego Wrap Vapor Barrier (15 mil)," Stego Industries LLC.
        3) "VaporBlock 15," Raven Industries.
16. Perimeter and Slab Insulation:
    a. "Styrofoam High Load 40," Dow Chemical Co.
17. Cement-Polymer Patching Mortar:
    a. "EUCO Poly-Patch," Euclid Chem. Co.
    b. "Masterpatch 220" or "EMACO S88," Chemrex, Inc.
    c. "Sikatop," Sika Chem. Corp.
    d. "Thin Coat Concrete Coat," Euclid Chem. Co.
18. Nonshrink Grout:
    a. "Crystex," L&M Construction Chemicals, Inc.
    b. "Five Star Grout," U.S. Grout Corp.
    c. "Master Flow," Chemrex, Inc.
    d. "Multi-Purpose," Symons.
    e. "NS Grout," Euclid Chemical Co.
    f. "Sure-Grip Grout," Dayton-Superior.
19. Chemical Hardener:
    a. "Day-Chem Hardener," Dayton-Superior.
    b. "Lapidolith," Sonneborn.
    c. "Mastertop CST," Chemrex, Inc.
    d. "Surfhard," Euclid Chemical Co.
20. Transparent Membrane Forming Curing Compound:
    a. "Kurez DR," Euclid Chemical Co.
    b. "L&M Cure R," L&M Construction Chemicals, Inc.
    c. "Sealtight 1100-Clear," W.R. Meadows.
21. Crystalline Concrete Waterproofing:
    a. Vandex International.
    b. Xypex Chemical Corp.
22. Epoxy Bonding Compound:
    a. "Concresive Liquid LPL," Chemrex, Inc.
    b. "Duralbond," Tamms Industries.
    c. "Euco #452 or #620 Epoxy," Euclid Chemical Co.
    d. "Rescon R606, R616, R631, R649," Symons Corp.
    e. "Sikadur 32 Hi-Mod," Sika Chemical Corp.
    f. "Thiopoxy," Grace Construction Products.
23. Fastening Systems:
    a. Medium-duty Expansion Anchors (Wedge Anchors):
        1) "Kwik-Bolt II" Hilti, Inc.
        2) "Power-Stud," Powers Fasteners, Inc.

3) "Trubolt," ITW Ramset/Red Head.
4) "Wedge-All," Simpson Strong-Tie Co., Inc.

b. Heavy-duty Expansion Anchors (Sleeve Anchors):
1) "HSL Heavy Duty Sleeve Anchor," Hilti, Inc.
2) "Power-Bolt," Powers Fasteners, Inc.
3) "Redi-Bolt," ITW Ramset/Red Head.
4) "Sleeve-All," Simpson Strong-Tie Co., Inc.

c. Heavy-duty Screw Anchors:
1) "Large Diameter Tapcon (LDT)," ITW Ramset/Red Head.
2) "Titen HD," Simpson Strong-Tie Co., Inc.
3) "Wedge-Bolt," Powers Fasteners, Inc.

d. Adhesive Anchors:
1) "AC100/AC5.5" or "Power-Fast," Powers Fasteners, Inc.
2) "Epcon," ITW Ramset/Red Head.
3) "Epoxy-Tie," Simpson Strong-Tie Co., Inc.
4) "HIT HY150/HIT-ICE," Hilti, Inc.

24. Bearing Pads:
a. Fluorocarbon Co.
b. Williams Products, Inc.

2.02 FORM MATERIALS

A. Forms for Smooth Form Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel materials, to achieve continuous, straight, smooth, exposed surfaces. Furnish largest practicable sizes to minimize joints and to conform to joint system shown on Drawings.

B. Forms for Rough Form Finish Concrete: Plywood, lumber, metal, or other acceptable material. Use lumber dressed on two edges and one side for tight fit.

C. Forms for Textured Finish Concrete: Use units with face design, size, arrangement, and configuration to match ENGINEER's control sample. Provide solid backing and form supports to stabilize textured form liners.

D. Forms for Cylindrical Columns and Supports: Metal, fiberglass-reinforced plastic or paper, or fiber tubes. Construct paper or fiber tubes of laminated plies using water-resistant adhesive with wax-impregnated exterior for weather and moisture protection. Provide units with sufficient wall thickness to resist loads imposed by wet concrete without deformation.

E. Form Coatings: Commercial formulation form-coating compounds with no more than 350 mg/ltr volatile organic compounds (VOCs) that do not bond with, stain, or adversely affect concrete surfaces, or prevent good bonding with later concrete surface treatments.

F. Forms Ties: Factory fabricated, adjustable length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units which shall leave no metal closer than 1-1/2 inches to surface.
1. Provide ties which, when removed, leave holes no larger than 7/8-inch or less than 1/2-inch in diameter in concrete surface.

2.03 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Epoxy Coated Reinforcing Bars: ASTM D 3963.

C. Welded Wire Fabric: ASTM A 185.

D. Welded Deformed Steel Wire Fabric: ASTM A 497.

E. 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. The use of bricks is not permitted.
   1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material does not support chair legs.
   2. For exposed-to-view concrete surfaces, where support legs are in contact with forms, use supports with legs that are plastic-protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).
   3. For epoxy-coated reinforcement, use supports that are plastic coated (CRSI, Class 1A) or stainless steel protected (CRSI, Class 2).

2.04 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I, except use Type III where applications require high-early-strength or Type II where required by ENGINEER for corrosive environments.

B. Use one brand of cement throughout Project, unless otherwise acceptable to ENGINEER.

C. Fly Ash: ASTM C 618, Type C or Type F (corrosive environments) with loss on ignition not more than 6 percent.

D. Ground Granulated Blast-Furnace Slag: ASTM C 989.

E. Silica Fume: ASTM C 1240.

F. Aggregates: ASTM C 33. Use aggregates from single source for exposed concrete.
   1. Fine aggregate: MDOT 2NS.
   2. Coarse aggregate: MDOT 6AA or 31A.

G. Water: Potable.

H. Nonstructural Fiber Reinforcement: Monofilament Polypropylene, Type F1 fibers designed as secondary reinforcing. Fibers to comply with ASTM C 1116, Type III, not less than 3/4-inch long.

I. Air-Entraining Admixture: ASTM C 260, and certified by manufacturer to be compatible with other admixtures.

J. Water-Reducing Admixture: ASTM C 494, Type A.

K. High-range Water-Reducing Admixture (Superplasticizer): ASTM C 494, Type F or Type G.

L. Water Reducing, Nonchloride Accelerator Admixture: ASTM C 494, Type E.

M. Water Reducing, Retarding Admixture: ASTM C 494, Type D.

N. Prohibited Admixtures: Calcium chloride thyocyanates or admixtures containing more than 0.1 percent chloride ions.

O. Potable Water Structures: For surfaces in contact with potable water, use only materials approved by Department of Public Health of the state that has jurisdiction.

2.05 ACCESSORIES

A. PVC Waterstops: PVC conforming to CRD-C 572. Size and type as shown on Drawings.
   1. Provide factory made waterstop fabrications for all changes of direction, intersections, and transitions leaving only straight butt joint splices for field fabrication.
   2. Provide hog rings or grommets spaced at 12 inches on center along length of waterstop between first and second ribs from end.

B. Bentonite Waterstops: Flexible strip of bentonite-butyl expanding rubber. Use for cast-in-place concrete structures.

C. Hydrophilic Waterstop: Flexible strip of hydrophilic expanding vinylester. Used for precast concrete structures where shown on Drawings.

D. Bituminous Joint Filler: ASTM D 1751.

E. Expansion and Isolation Joint Filler: Sponge rubber conforming to ASTM D 1752, Type I. Concrete shall be gray color with density not less than 30 pounds per cubic foot and compression deflection not more than 25 percent of thickness at 20 psi apply pressure.

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

G. Granular Base: Evenly graded fine aggregate to provide smooth and even surface below slabs on grade. Minimum 6-inch thickness or as noted on Drawings.

H. Vapor Retarder: Polyethylene sheet, meeting or exceeding the requirements of ASTM E 1745, Class C or Class B, as indicated on Drawings.

I. Perimeter and Slab Insulation: Rigid thermal plastic foam board with 40 psi minimum compressive strength, maximum water absorption of 0.1 percent by volume, and maximum water permeability of 0.8 perm-inch meeting ASTM C 578, Type VI; 2 inches thick with adhesives as recommended by insulation manufacturer.

J. Nonshrink Grout: ASTM C 1107, factory pre-mixed, cementitious natural aggregate grout.

K. Chemical Hardener: Colorless aqueous solution containing magnesium fluosilicate and zinc fluosilicate combined with wetting agent, containing not less than 2 pounds of fluosilicates per gallon.

L. Moisture-Retaining Cover: Waterproof paper, polyethylene film, or polyethylene-coated burlap complying with ASTM C 171.

M. Transparent Membrane-Forming Curing Compound: Liquid membrane-forming curing compound complying with ASTM C 309, Type 1, Class B. Formed membrane shall be suitable for later application of cementitious coating or topping.

N. White Pigmented Membrane-Forming Curing Compound: Liquid membrane-forming curing compound complying with ASTM C 309, Type 2, Class B. Tests for moisture retention, reflectance, and drying time shall be based on a curing compound applied at 200 square feet per gallon.

O. Crystalline Concrete Waterproofing: Cementitious crystalline concrete waterproofing material that permanently fixes nonsoluble crystalline growth throughout capillary voids.

P. Epoxy Bonding Agent: ASTM C 881, two-component material suitable for use on dry or damp surfaces. Provide material Type, Grade, and Class to suit Project requirements.

Q. Bearing Pads: Vulcanized chloroprene elastomeric compound cut from molded sheet with 50 SHORE A durometer surface hardness. Elastomeric bearing pads shall conform to requirements for 100 percent virgin polychloroprene (Neoprene) bearing pads as specified by AASHTO Standard Specifications for Highway Bridges. Install in forms under poured-in-place concrete as shown on design details.

R. Mechanical Anchors: Manufactured using corrosion-resistant materials.

S. Adhesive Anchoring System: ASTM C 881, Type IV, Grade 3. Provide material Class to suit Project requirements.

2.06 PROPORTIONING AND DESIGN OF MIXES

A. Prepare design mixes for each concrete class and strength by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method is used, use independent testing facilities acceptable to ENGINEER for preparing and reporting proposed mix designs. Testing facility shall not be identical to that used for field quality control testing.

B. Fly ash shall be used to partially supplant cement content in Class A and Class S concrete, unless noted otherwise, and is optional in other classes. Replacement quantity of cement content by weight shall be not less than 15 percent for Class A and Class S concrete or more than 25 percent for all classes except Class F.

C. For concrete Class A and Class S, concrete mix design with fly ash and silica fume shall be maximum 30 percent of cement content by weight, and shall constitute no more than 20 and 10 percent, respectively, of the total weight of cementitious materials.

D. For concrete, Class S, use Portland cement Type II with fly ash, Type F.

E. Ground granulated blast furnace slag (GGBFS) shall only be permitted for mass concrete placement and as approved by ENGINEER. Replacement quantity of cement content weight shall not be less than 35 percent or more than 50 percent.

F. Coarse aggregate shall be MDOT 6AA, except for Class G concrete which shall use MDOT 31A.

G. Design mixes to provide normal weight concrete for following classes and properties:

1. Locations for concrete classes are as follows:
   a. Class A Structural concrete (slabs, walls, columns, beams, equipment bases, thrust blocks and slab toppings 2 inches or greater in thickness).
   b. Class S Sulfate resistant structural concrete (slabs, walls, columns, and beams) where indicated on Drawings.
   c. Class G Grout fill for use in sweeping in final surfaces in sanitary structures and slab toppings less than 2 inches in thickness.
   d. Class P Exterior pavements and sidewalks (unless otherwise indicated on Drawings).
   e. Class B Sidewalks and manhole bases (unless otherwise indicated on Drawings).
   f. Class C Fill within manholes, mud mats, fill under structures, encasement for piping below or adjacent to structures and encasement for floor drains, sewer inlets and similar items.
   g. Class F Flowable fill for filling spaces as permitted and directed by ENGINEER.
2. Properties for concrete classes are as follows:

Concrete Class		**A**	**S**	**G**	**P**	**B**	**C**	**F**
28-Day* Compressive Strength (f'c), psi		4,000	5,000	4,000	3,500	3,000	2,000	50-100
Cement Content per cubic yard of concrete, sacks minimum **		6	7	6	5.5	5	4	0.4-3.0
Water/Cement Ratio by weight, maximum		0.44	0.40	0.44	0.44	0.58	0.75	0.40-0.75
Air Content, percent by volume		5±1	<4	5±1	6.5+±1.5	6.5±1.5	NA	NA
Slump at point of placement, inches.	WR***	2-4	2-4	2-4	2-4	3-5	3-6	NA
	MRWR	4-6	4-6	4-6	4-6	NA	NA	NA
	HRWR	6-8	6-8	6-8	6-8	NA	NA	NA
Monofilament Polypropylene, Type F1		Yes	Yes	Yes	NA	NA	NA	NA

* 7-day compressive strength for high-early-strength concrete.
56-day compressive strength for mass concrete with ground granulated blast furnace slag.
** For concrete with fly ash, values are total of cement plus fly ash (except Class F concrete).
*** Slump prior to the addition of mid-range or high-range water reducers.

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 nonchloride 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. Use nonstructural synthetic reinforcement, monofilament polypropylene Type F1 in Class A concrete for exposed exterior surfaces without earth covering, and as specified by ENGINEER for other concrete mix design. Bottom slabs of open concrete tanks do not require synthetic reinforcement. The synthetic reinforcing fibers shall be added to the concrete mix at the rate of 1.5 pounds per cubic yard and in accordance with manufacturer's recommendations.

2.07 CONCRETE MIXING

A. Ready-Mix Concrete: Comply with ASTM C 94 requirements and as specified in this Section.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Coordinate installation of joint materials, perimeter insulation, and vapor retarders with placement of forms and reinforcing steel.

3.02 FORMS

A. Design, build, support, brace, and maintain formwork to support vertical and lateral, static, and dynamic loads applied to formwork until concrete structure can support applied loads. Construct formwork so that concrete members and structures are of correct size, shape, alignment, elevation, and position. Deflection of form-facing material between supports, and deflection of form supports shall not exceed 1/4 inch per 10 feet of span.

B. Design formwork to be removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent materials.

C. Construct forms to sizes, shapes, lines, and dimensions shown, and to obtain accurate alignment, location, grades level and plumb for work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features in Work. Use selected materials to obtain specified finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.

D. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top

forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, and recesses to prevent swelling and for easy removal.

E. 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.

F. Chamfer exposed corners and edges, 3/4 inch minimum, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

G. 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.

H. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before placing concrete. Retighten forms and bracing after concrete placement to eliminate mortar leaks and to maintain proper alignment.

3.03 VAPOR RETARDER INSTALLATION

A. Following leveling and tamping of granular base for slabs on grade, place vapor retarder sheeting where shown directly under concrete slab, unless otherwise indicated on Drawings, with longest dimension parallel with direction of pour.

B. Lap joints 6 inches minimum and seal with appropriate tape as recommended by manufacturer.

C. Seal around all duct, pipe, or wire penetrations using appropriate tape and/or prefabricated boots.

D. Damaged areas shall be repaired by placing a piece of vapor retarder material over the damaged area with a 6-inch minimum lap on each side. The perimeter of the repair shall be sealed using an appropriate tape.

3.04 PLACING REINFORCEMENT

A. Comply with CRSI recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports, and as specified in this Section.
   1. Avoid cutting or puncturing vapor retarder during reinforcement placement and concreting operations.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.

C. Accurately position, support, and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers.

D. Place reinforcement to obtain clear cover space for concrete protection:
   1. Footings and slabs cast over mud mats, supported slabs, beams, girders, columns, and walls, both interior and exterior unless noted otherwise: 2 inches.

2. Footings and slabs cast against and permanently exposed to earth: 3 inches.

E. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Direct wire tie ends into concrete, not toward exposed concrete surfaces.

F. Field bending of reinforcement:
   1. Field bending of plain reinforcement shall be performed using an approved and appropriate sized portable hydraulic device that makes ACI-approved radius bends. No other field bending method shall be permitted.
   2. No field bending shall be permitted for epoxy coated reinforcement.

G. Install welded wire fabric in as long lengths as practical. Lap adjoining pieces one full mesh and lace splices with wire.

3.05 JOINTS

A. Locate and install construction joints as shown or, if not shown, locate so as not to impair strength and appearance of structures, at intervals not to exceed 50 feet. For construction joints in water-containing structures or tanks or in water-restraining structures, use watertight joints.

B. Continue reinforcement across construction joints, unless otherwise noted. Mechanical inserts with threaded studs are not accepted as substitutes for through-dowels.

C. Locate construction joints in floor system at or near middle of span in slabs, beams, or girders unless beam intersects girders at this point. Then, where not shown on Drawings, joints in girders shall be offset distances twice the width of beams, and provisions made for shear by web reinforcement across joints.

D. Provide watertight joints to prevent water seepage. Take special care in finishing surfaces to which succeeding concrete is bonded. Provide waterstops in joints if shown. Install waterstops to form continuous diaphragm in each joint. Make provisions to support and protect exposed waterstops during progress of work. Fabricate field joints in waterstops according to manufacturer's printed instructions.

E. Provide isolation joints in slabs-on-ground at points of contact between slabs-on-ground and vertical surfaces of column pedestals, foundation walls, and grade beams.

F. Contraction (Control) Joints in Slabs-on-Ground: Construct contraction (control) joints in slabs-on-ground to form panels of patterns as shown. Use saw cuts 3/16 inch by 1/4 slab depth or inserts 1/4-inch wide by 1/4 of slab depth unless otherwise noted.
   1. If joint pattern is not shown, provide joints at 15 feet at most in either direction, with locations to conform to bay spacing wherever practical (at column centerlines, half-bays, third-bays).
   2. Form contraction joints by inserting pre-molded plastic, hardboard, or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface. Tool slab edges round on each side of insert. After concrete has cured, remove inserts and clean groove of loose debris.
   3. Cut contraction joints in unexposed floor slabs by saw cuts as soon as practical after slab finishing when it can be safely done without dislodging aggregate.

3.06 INSTALLATION OF EMBEDDED ITEMS

A. 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.

B. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain set elevations and contours in finished slab surface. Provide and secure units sufficiently strong to support screed strips by use of strike-off templates or accepted compacting screeds.

C. 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.

D. PVC Waterstops:
   1. Field butt splices shall be heat fused using a Teflon-coated thermostatically controlled waterstop splicing iron at approximately 380 degrees F following manufacturer's recommendations. Lapping of waterstop or use of adhesives shall not be allowed.
   2. Center the waterstop in joint and secure waterstop in correct position using hog rings or grommets spaced at 12 inches on center along length of waterstop and wire tie to adjacent reinforcing steel. Do not drive nails or otherwise puncture additional holes in the waterstop when forming.

E. Bentonite and Hydrophylic Waterstops:
   1. Adhere waterstop to substrate using manufacturer's recommended adhesive.
   2. Tightly butt ends of waterstop together to form a continuous waterstop. Do not lap waterstop.
   3. Verify that minimum concrete per manufacturer's recommendations will occur along waterstop's entire length. Do not install waterstop in keyways.
   4. Follow manufacturer's recommended installation procedures.

3.07 PREPARATION OF FORM SURFACES

A. Clean re-used forms of concrete matrix residue, repair and patch to return forms to acceptable surface condition.

B. Coat contact surfaces of forms with form-coating compounds before placing reinforcement.

C. Thin form-coating compounds only with acceptable thinning agents, quantity, and under conditions of form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete is placed. Apply in compliance with manufacturer's instructions.

D. Coat steel forms with non-staining, rust-preventive form oil to protect against rusting. Rust-stained steel formwork is not acceptable.

3.08 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, reinforcing steel, waterstop installation, and other embedded or cast-in items.

1. Notify other crafts to permit installation of their work.
2. Cooperate with other trades in setting their work.
3. Moisten wood forms immediately before placing concrete where form coatings are not used.
4. Apply temporary protective covering to lower 2 feet of finished walls where adjacent floor slabs are poured to guard against spattering during slab placement.

B. Comply with ACI 304R and as specified in this Section.

C. Discharge Concrete at Site within 1-1/2 hours after cement is added to water or aggregates. When air temperature exceeds 85 degrees F, the discharge time shall be less than 45 minutes. The 45-minute requirement may be waived with the use of a water reducing, retarding admixture and approval of ENGINEER.

D. Provide trip ticket in duplicate for each ready-mixed concrete load delivered, stating truck number, Project name, CONTRACTOR and producer, batching time, total yards of concrete and material contained therein. Show ticket to ENGINEER upon request. Fill in concrete discharge time and turn over to ENGINEER trip ticket copies at end of each day.

E. Deposit concrete continuously or in layers so that no concrete is placed on concrete which has hardened sufficiently to cause seams or planes of weakness. If section cannot be placed continuously, provide construction joints as specified. Deposit concrete as nearly as practical to its final location to avoid segregation.

F. When depositing by chute, provide equipment of size and design to ensure continuously flowing concrete. Provide discharge end of chute with baffle plate to prevent segregation. Position chute so that concrete need not flow more than 5 feet horizontally.

G. Do not drop concrete from chute end distances greater than 3 times the deposited layer thickness, nor more than 5 feet. Where distance from chute end to surface of concrete exceeds these distances, use spout and maintain lower end as near to deposit surface as practical. When operations are intermittent, discharge chutes into hoppers.

H. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24 inches to avoid inclined construction joints. Where placement involves several layers, place each layer while preceding layer is still plastic to avoid cold joints.
   1. Fill bottom of wall space with 2 to 4 inches of cement slurry immediately before depositing concrete in walls. Use cement slurry composed of 1 part Portland cement, 2 parts fine aggregate, and sufficient water (but not to exceed 0.45 parts) for 7-inch slump mixture.
   2. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping. Use equipment and procedures for concrete consolidation in accordance with ACI recommended practices.
   3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible machine effectiveness. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into concrete layers that have begun to set. At each insertion, limit duration to time necessary to consolidate concrete and complete reinforcement embedment and other embedded items without causing mix segregation. Keep vibrators away from waterstops to prevent displacement.

I. Placing Concrete Slabs: Deposit and consolidate concrete slabs in continuous operations between construction joints until panel or section placement is complete.

1. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Bring slab surfaces to correct level with straightedge and strikeoff. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces before beginning finishing operations.
3. Maintain reinforcing in proper position during concrete placement operations.
4. Maintain waterstop in proper position during concrete placement operations.
5. Concrete Placement against Expanding Bentonite Waterstop. Direct concrete flow away from bentonite water stops. If flow cannot be away from bentonite, direct flow parallel to waterstop.
6. Moisten soil when depositing concrete directly on granular soil.

J. Cold Weather Placing: Protect concrete work from physical damage or reduced strength attributed to frost, freezing actions, or low temperatures by using techniques in ACI 306R and as specified in this Section.
1. When air temperature has fallen to, or is to fall below 40 degrees F, uniformly heat water and aggregates before mixing to obtain concrete mixture temperature not less than 50 degrees F, and not more than 80 degrees F at placement point.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.

K. Hot Weather Placing: When air temperature is above 85 degrees F, conditions could exist that would seriously impair quality and concrete strength; place concrete in compliance with ACI 305R and as specified in this Section.
1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 85 degrees F. Chill mixing water or use chopped ice to control temperature. If using ice, water equivalent of ice is included in total mixing water quantity. Using liquid nitrogen to cool concrete is CONTRACTOR's option.
2. Cover reinforcing steel with water-soaked burlap, if steel becomes too hot, to reduce steel temperature so not to exceed ambient air temperature immediately before embedment in concrete.
3. Fog spray forms, reinforcing steel, and subgrade just before placing concrete.
4. Use water-reducing retarding admixture (Type D) when required by high temperatures, low humidity, or other adverse placing conditions.

3.09 DEPOSITING CONCRETE UNDER WATER

A. Concrete deposited in water shall be Class A, unless otherwise noted. Place concrete carefully in mass by tremie or bottom dump bucket. Do not disturb deposited concrete. Maintain still water at deposit point.

B. Support tremie to permit free movement of discharge end over entire work surface and to permit rapid raising or lowering to adjust concrete flow. Place concrete full depth in one continuous operation, completing work to grade progressively from one end of form to other. Keep tremie in freshly deposited concrete, to be withdrawn only at completion of each pour, or required by piling or form bracing. After withdrawing tremie, recharge it with concrete above water and lower it to new position where discharge end can be set into freshly deposited concrete. During placing operations, keep tremie tube full to bottom of hopper. When dumping batch into hopper, induce flow of concrete by raising discharge end of tube slightly, but not out of concrete.

C. When placing concrete under water using bottom dump bucket, completely fill bucket and slowly lower it to avoid backwash. Do not dump until bucket rests on surface upon which concrete is deposited. When discharged, withdraw bucket slowly until well above concrete, to maintain as nearly as practical still water at discharge point and to avoid agitating mixture.

D. Do not remove forms until concrete has been in place for minimum period as follows:

	Average Water Temperature During Period	
	40 - 50 degrees F	50 degrees F
Time (days)	12	7

3.10 FINISH OF FORMED SURFACES

A. Rough Form Finish: Use for formed concrete surfaces not exposed to view in finish Work during normal operation or maintenance, or by other construction and not covered with coating or covering material applied directly to concrete. This concrete surface has texture imparted by form-facing material. Tie holes and defective areas are repaired and patched, and fins and other projections exceeding 1/4-inch in height are rubbed down or chipped off.

B. Smooth Form Finish: Use for formed concrete surfaces exposed-to-view, during normal operation or maintenance, or are covered with coating or covering material applied directly to concrete, including waterproofing, dampproofing, painting, or other similar system. This is as-cast concrete surface obtained with selected form material, arranged orderly and symmetrically with minimum seams. Repair and patch defective areas. Remove and smooth fins or other projections completely. Fill major air void holes.

C. Grout Cleaned Finish: Provide grout-cleaned finish to scheduled formed concrete surfaces that are painted, stained, or waterproofed after receiving smooth form finish treatment.
   1. Combine 1 part Portland cement to 1-1/2 parts fine sand by volume, and mix with water to consistency of thick paint. Proprietary additives may be used at CONTRACTOR's option. Blend standard Portland cement and white Portland cement, quantities determined by trial patches, so that dry grout color matches adjacent surfaces.
   2. Thoroughly wet concrete surfaces and apply grout to coat surfaces and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for 36 hours after rubbing.

D. Related Unformed Surfaces: At horizontal offsets and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with texture matching adjacent formed surfaces. Continue surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless shown otherwise.

3.11 CONCRETE CURING AND PROTECTION

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Start curing as soon as free water has disappeared from concrete surface after placing and finishing. Maintain curing as follows:
   1. All concrete unless otherwise noted: 7 days.

2. High-early-strength concrete: 3 days.
3. Mass concrete with ground granulated blast furnace slag: 14 days.

B. Curing Methods: Cure concrete for water-retaining structures by moist curing. Cure concrete for other structures by curing compound, moist curing, moisture-retaining cover curing, or combinations thereof.

C. Provide Moist Curing by following methods:
1. Keep concrete surface continuously wet by covering with water.
2. Continuous water-fog spray.
3. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to cover concrete surfaces and edges, with 4 inches lap over adjacent absorptive covers.

D. Provide Moisture-Retaining Cover Curing as follows:
1. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practical width with sides and ends lapped 3 inches and sealed by waterproof tape or adhesive.
2. Immediately repair holes or tears during curing period using cover material and waterproof tape.

E. Provide Curing Compound as follows:
1. Apply specified curing compound to concrete slabs as soon as last finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain coating continuity and repair damage during curing period.
2. Transparent curing compound shall be used for structural concrete (Class A concrete). White curing compound shall be used for exterior pavements (Class P concrete) and sidewalks (Class B concrete).
3. Do not use membrane curing compounds on surfaces that are covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, flooring (ceramic or quarry tile, glue-down carpet), painting, and other coatings and finish materials, unless otherwise acceptable to ENGINEER.

F. Curing Formed Surfaces: Cure formed concrete surfaces, including beam undersides, supported slabs and other similar surfaces by moist curing with forms in place for full curing period. If form removal occurs before curing period is up, continue curing by methods specified above as applicable.

G. Curing Unformed Surfaces: Cure unformed surfaces, including slabs, floor topping, and other flat surfaces, by application of appropriate curing method.

3.12 FORM REMOVAL

A. Vertical Forms not supporting concrete weight may be removed when concrete has sufficiently set to resist damage from removal operation.

B. Other forms shall be left in place until concrete has attained strength to support its own weight and construction live loads, unless removed in sections, and each structural section immediately reshored.

C. Time Periods: Forms remain in place as shown in table below. If form removal occurs before time shown in the table, apply curing procedures previously specified.

Minimum Time Forms are to Remain in Place:

	Average Air Temperature* During Period	
Part of Structure	40 - 50 degrees F	50 degrees F
Walls, columns and sides of beam (hours)	72	24
Bottom forms for slabs, beams arches not reshored (days)	12	7
Bottom forms for slabs, beams and arches if reshored (days)	7	4

* Air temperature near form.

3.13 RE-USE OF FORMS

A. Clean and repair surfaces of forms to be re-used in Work. Split, frayed, delaminated, or damaged form-facing materials are not acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.

B. When extending forms for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces.

3.14 MISCELLANEOUS CONCRETE ITEMS

A. Fill-in holes and openings left in concrete structures for work by other trades, unless otherwise shown or directed. Do fill in after other trades' work is in place. Mix, place, and cure concrete to blend with in-place construction. Provide other miscellaneous concrete filling shown to complete Work.

B. Concrete Curbs: Provide concrete curbs wherever shown on Drawings. Open stairwells, floor openings, and balcony edges usually require curbs. Construct curbs as detailed, with 1-inch radius top edges. Coves are not required at intersections with structural floors. Coves are required at intersections with top course floor finishes or monolithic floor finishes.

C. Removal of Existing Concrete: Remove existing concrete where shown or required. Neatly finish concrete edges remaining in place and exposed to view in finished structure with cement mortar.
   1. Concrete cutting shall be done competently without injury to remaining portions of structures.

D. Bonding New to Old Concrete: Where shown on Drawings, existing concrete surfaces against which new concrete is placed shall be thoroughly cleaned and brush-coated with bonding agent. Follow manufacturer's directions, especially on material working time.

3.15 CONCRETE APRONS

A. Construct concrete aprons in front of doorways as shown on Standard Details.

B. Provide transverse tooled joints at centers of vehicular doorway and at intervals not to exceed 10 feet. Joints to be 2-1/2 inches deep by 1/8- to 1/4-inch wide, finished smooth and true to line.

C. Provide expansion joint at intervals not to exceed 40 feet and wherever aprons abut against structures, buildings, or curbs. Bituminous type fiber joint filler shall be 1/2-inch thick.

3.16 CONCRETE SURFACE REPAIRS

A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after form removal.
   1. Cut out honeycomb, rock pockets, voids over 1/4-inch in dimension, and holes left by tie rods and bolts, down to solid concrete but no less than 1 inch deep. Make cuts perpendicular to concrete surface. Thoroughly clean, dampen with water, and brush-coat patched area with specified bonding agent. Place patching mortar after bonding compound has set as recommended by manufacturer.
   2. For exposed to view surfaces, blend white Portland cement and standard Portland cement so, when dry, patching mortar matches surrounding color. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

B. Repair of Formed Surfaces: Remove and install new concrete having defective surfaces if defects are irreparable to satisfaction of ENGINEER. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets; fins, and other projections on surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.
   1. Repair concealed formed surfaces, where practical, containing defects which affect concrete durability. If defects are irreparable, remove and install new concrete.

C. Repair of Unformed Surfaces: Test unformed surfaces for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as specified in this Section. Test unformed surfaces sloped to drain for slope trueness using templates having required slope.
   1. Repair finished unformed surfaces containing defects which affect concrete durability. Defects include crazing, cracks more than 0.01-inch wide or which penetrate to reinforcement or completely through nonreinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets, and other objectionable conditions.
   2. Correct high areas in unformed surfaces by grinding, after concrete has cured 14 days.
   3. Correct low areas in unformed surfaces during or immediately after surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to ENGINEER.
   4. Repair defective areas, except random cracks and single holes not exceeding 1-inch diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with 3/4-inch clearance around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete to provide same concrete type or class as original concrete. Place, compact and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

D. Repair isolated random cracks and single holes not over 1-inch in diameter by dry-pack method. Groove top of cracks and cut out holes to sound concrete. Clean out dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of 1 part Portland cement to 2-1/2 parts fine aggregate passing No. 16 mesh sieve, using only enough water as specified for handling and placing. Place dry-pack after bonding compound has set per manufacturer's instructions. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.

E. Repair Leaking Cracks: Where practical, seal off cracks on water contact face with waterproofing or dampproofing material. If this is not practical or if leakage persists, then repair cracks on exposed faces by routing out square groove not less than 1-inch wide by 1-inch deep, applying slurry bond coat and filling with stiff nonshrink mortar. Bond coat and mortar shall be cementitious crystalline concrete waterproofing material. Follow manufacturer's application and curing instructions. Match repair patch finish in color and texture to original.

F. Structural Repairs: Do structural repairs with prior approval by ENGINEER for method and procedure using specified epoxy adhesive and mortar.

G. Repair Methods: ENGINEER may allow use of other nonspecified methods subject to review and acceptance by ENGINEER.

3.17 QUALITY CONTROL TESTING DURING CONSTRUCTION

A. Provide qualified personnel and employ testing laboratory, approved by ENGINEER, to do tests and to submit test reports.

B. Sampling Fresh Concrete: ASTM C 172, except modified for slump and air-content tests to comply with ASTM C 94.
   1. Slump: ASTM C 143, one each time compression test specimens are made; additional tests when concrete consistency seems to have changed.
   2. Air Content: ASTM C 231, pressure method, one each time compression test specimens made.
   3. Concrete Temperature: Test hourly when air temperature is 40 degrees F and below, and when 80 degrees F and above; and each time compression test specimens are made.
   4. Compression Test Specimen: ASTM C 31, four standard cylinders for each compressive strength test set, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens.
   5. Compressive Strength Tests: ASTM C 39, one set for each day's pour exceeding 5 cubic yards plus additional set for each 100 cubic yards over and above first 50 cubic yards of each concrete class placed in 1 day; 1 specimen tested at 7 days, 2 specimens tested at 28 days, and 1 specimen retained in reserve for later testing if required.

C. Test Results: Report test results in writing to ENGINEER and CONTRACTOR within 24 hours after tests. Compressive strength test reports shall contain Project identification name and number, concrete placement date, concrete testing service name, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials; compressive breaking strength and break type for both 7-day tests and 28-day tests.

D. Acceptance: Concrete strength shall be considered satisfactory if averages of 3 consecutive strength test results equal or exceed specified 28-day compressive strength (f'c), and no individual strength test result falls below specified compressive strength by more than 500 psi.

E. Failure to Meet Requirements:
   1. Should 7-day compressive strengths shown by test specimens fall below 65 percent of required 28-day strength (f'c), ENGINEER will have the right to require changes in proportions for remaining Work. Furthermore, ENGINEER will have the right to require additional curing, as specified in this Section, on those portions or structures represented by failed test specimens.
   2. Should 28-day compressive strengths (f'c) test results fail to meet required strength, core-boring tests conforming to ASTM Standard C 42 shall be made at CONTRACTOR's expense within 60 days of that concrete placement.

F. At locations where concrete quality is deemed questionable by ENGINEER, core-boring tests shall also be made at CONTRACTOR's expense.

G. Concrete is acceptable if average strength of 3 cores is at least 85 percent and no single core is less than 75 percent of required minimum allowable 28-day compressive strengths (f'c). If core-boring test results fail to meet strength requirements, ENGINEER will have right to require strengthening or replacing those portions of structures which failed to develop specified strength.

H. Provide additional curing when ordered by ENGINEER because of failure to meet requirements. It shall be done at CONTRACTOR's expense, and no claim for extra compensation for additional curing will be allowed. Additional curing shall extend period of protection. Additional curing is limited to 60 days.

I. Additional Tests: Testing service shall make additional in-place concrete tests when test results suggest specified concrete strengths and other characteristics have not been attained. Testing service may conduct tests to determine adequacy by cored cylinders complying with ASTM C 42, or by other approved methods. CONTRACTOR shall pay for additional tests when unacceptable concrete is verified.

END OF SECTION

SECTION 15 10 00 - PRESSURE PROCESS PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes the following:
   1. Provide all labor, materials, and equipment necessary for fabrication and production of the items specified in this Section and as shown on Drawings or listed on Schedule.
   2. Unless otherwise noted on Drawings, or in this Section, pressure process piping 4 inches in diameter and larger shall be part of this Work.
   3. Dismantling of existing piping and supports, where required or shown or noted on Drawings; piping connections to existing piping, structures, valves, gates, measuring devices, pumps and other equipment, including equipment erected under other Contracts, are included in Work of this Section. Piping shall contain necessary unions or companion flanges to allow ease of equipment removal.
   4. Complete all the demolition work and repair thereof to existing walls and slabs as required for the installation of this Work including grouting of all sleeves and castings. Provide all necessary joint and coupling materials, including bolts, nuts and gaskets, wall castings or sleeves, and standard or special fittings. Furnish hangers, supports, anchors, blocking, harnesses, and other necessary closure pipe sections and special fittings. Provide and secure in proper alignment, all sleeve and casting openings in existing walls and slabs, including repair thereof.
   5. Provide all shop-applied interior and exterior pipe linings and coatings. Provide plugs in open ends of pipe, temporary bulkheads, protection of surface and subsurface improvements, cleaning, painting, testing, and disinfection, as required to accomplish Work as specified and shown on Drawings.

B. Products Supplied But Not Installed Under This Section:
   1. All piping, fittings, appurtenances, and shop-applied coatings shall be supplied as specified under this Section.
   2. The installation and testing of Water Distribution and Pumping Mains shall be performed as specified in this Section.

1.02 SUBMITTALS

A. Shop Drawings: Submit in accordance with Section 01 33 00, Shop Drawings covering the items included under this Section. Contractor shall field verify existing piping (diameter, thickness, etc.) prior to preparing Shop Drawings. Shop Drawing submittals shall include:
   1. Shop Drawings shall be fully dimensioned Drawings showing the piping in full detail with exact locations, dimensions, and schedules of all pipe, fittings, hangers, supports, and appurtenances. They shall be made in accordance with the general information shown on Drawing and special information furnished by the several manufacturers of equipment. Where special fittings are required, they shall be shown in large detail with all necessary dimensions.
   2. Each pipe section, special fitting, casting, sleeve, and appurtenance shall be identified on Drawings by its respective erection mark.
   3. Design details of joints and joint restraint shall be submitted to ENGINEER for ENGINEER's consideration and approval before ordering any pipe.
   4. Product Data: Submit product data covering the items included under this Section.

B. Record Drawings: At Project closeout, submit record Drawings of installed products, in accordance with requirements of Section 01 77 00.

1.03 QUALITY ASSURANCE

A. All Work under this Section shall be done in accordance with standard practices as recommended by manufacturer and AWWA.

B. Codes, Ordinances, and Standards: Manufacture, storage, and erection of equipment under this Contract shall be in accordance with current ASA (ANSI), AWWA, and ASTM Standards. Standards and Specifications referenced herein shall be the current published edition. The manufacturer of the pipe and fittings shall furnish ENGINEER a certified statement that all pipe and fittings furnished by manufacturer meet the material requirements and have been inspected and tested in accordance with the applicable Specification and Standard.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Storage:
   1. All pipe and related items installed under this Section shall be stored as recommended by manufacturer.
   2. CONTRACTOR shall take all actions necessary to protect all items installed under this Contract including furnishing all special storage areas required by equipment manufacturers.
   3. Pipe shall be stored on suitable timber skids free from contact with the ground. Gaskets shall be stored in as cool, clean, and shaded a place as practical.

B. Handling:
   1. All items installed under this Contract shall at all times be handled as recommended by manufacturer and in such a manner as to avoid any damage.
   2. All special handling equipment and temporary supports shall be provided by CONTRACTOR.
   3. Items will be subject to inspection and approval upon delivery to the Site and after storage. No cracked, broken, or damaged pipe shall be used.
   4. In the event coatings are damaged, the damaged area shall be recoated with an approved coating similar to that specified for that item.
   5. During handling, hauling, and storage of pipe, each piece shall be kept from contact with adjacent pieces by means of wooden blocks or timbers.

1.05 PROJECT CONDITIONS

A. Existing Conditions: The Drawings are not intended to show every detail of construction or location of piping or equipment. Where existing conditions make it necessary or advisable to change location of piping or equipment, CONTRACTOR shall so inform ENGINEER for ENGINEER's approval.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with specified requirements, manufacturers offering products which may be incorporated in Work include:
   1. Push-On Joints (POJ):

a. Bell-Tite.
b. Ring-Tite.
c. Tyton.
d. Fastite.

2. Mechanical Joint-Retaining Glands, no substitution or "or equals" will be accepted:
   a. "Megalug Series," as manufactured by EBAA Iron.
3. Mechanical Sleeve Seals:
   a. Thunderline Corp.
   b. Calpico, Inc.

2.02 PIPE JOINTS

A. All joint material and lubricants shall be furnished with the pipe, including all joint material required for connection to equipment furnished under other Sections. All joint materials shall be assembled in accordance with standard practice and manufacturer's recommendations. All equipment connections shall be flanged, union, or grooved coupling so that equipment can be removed without disassembly of the connecting piping.

B. Flanged Joints (FJ): Pipe flanges shall conform to American Standards: dimensions, ANSI B16.1 and threads, ANSI B2.1. Flange faces except stainless steel shall be coated with a rust inhibitor immediately after drilling.
   1. Flanges for cast or ductile iron pipe and fittings shall be ductile iron and meet the requirements of AWWA C115 (ANSI 21.15).
   2. Flanged joints shall be made up with full-face 1/8-inch rubber gaskets. Gaskets for gas lines shall be neoprene and asbestos.
   3. Flanges shall be firmly bolted with machine, stud or tap bolts of the proper size and number meeting the requirements of ASTM A 307, Grade B. Joints made with bolts or bolt studs shall have a nut on each side. Bolt projection through nuts shall be equal, and where studs are used, bolt projection on each side of the flange shall be equal.
   4. All nuts and bolts shall be cadmium plated or hot-dip galvanized except on stainless steel flanges shall be 316L stainless steel.
   5. Flange joints shall not be used on ground-buried pipe.

C. Push-On Joint (POJ): Where shown or noted on Drawings rubber gasket type push-on or slip-on joints shall be allowed as approved by ENGINEER.
   1. Joints shall conform to ANSI A21.11 and AWWA C111.
   2. Push-on joints shall generally be used on all ground-buried ductile iron or PVC pipe.
   3. All push-on joints are to be restrained in accordance with the paragraph on joint restraints.

D. Mechanical Joints (MJ): Mechanical joint shall conform to ANSI A21.10 and AWWA C110, or ANSI A21.11.
   1. Each joint shall be complete with rubber gasket, cast iron gland and a full complement of high-strength, low-alloy steel bolts and nuts.
   2. All mechanical joints are to be restrained in accordance with the paragraph on joint restraints.

2.03 PIPING

A. Ductile Iron Pipe (DIP): Buried ductile iron pipe shall be either the Pressure Class indicated on Bid Form or on Schedule. If no classification is indicated, pipe shall be the highest Standard Pressure Class available. Ductile iron pipe shall be manufactured in accordance with AWWA C151

(ANSI A21.51). Each pipe run shall be of the same class. Pipe sizes indicated are inside diameter (I.D.).

1. Fittings for flanged ductile iron pipe shall be ductile iron or cast iron and shall meet the requirements of AWWA C110 (ANSI A21.10) and for 54-inch and larger sized shall meet the requirements of AWWA C153 (ANSI A21.53). Fittings for mechanical joint ductile iron pipe shall meet the requirements AWWA C110 (ANSI A21.53) Ductile iron fittings shall be rated for 350 psi, pipe sizes 24-inch diameter and less and 250 psi for pipe sizes over 24-inch diameter, except that ductile iron flanged fittings shall be rated for 250 psi for all pipe diameters.
2. Cast iron fittings shall be rated for 250 psi, pipe sizes 12-inch diameter and less and 150 psi for pipe sizes over 12-inch diameter.
3. Ductile iron joints shall be mechanical, flanged, and push-on, as specified under Pipe Joints, as shown or noted on Drawings, listed on Schedule, and approved by ENGINEER. Joints shall meet the requirements of AWWA C111 (ANSI A21.11). All joint materials shall be furnished with the pipe.
4. Coatings and Linings: Ductile iron pipe and fittings to be ground buried shall be coated by manufacturer on the outside with an asphaltic coating 1 mil thick, in accordance with AWWA C151 and C110 (ANSI A21.51) and cement lined, standard thickness, in accordance with AWWA C104/ANSI 21.4. The pipe shall be supplied with and wrapped in polyethylene encasement in accordance with AWWA C105 (ANSI 21.5) and shall be installed following Method "A."
5. Exposed pipe and fittings shall be coated by manufacturer on the outside with a universal rust-inhibitive primer 2 mils minimum dry thickness, and cement lined, standard thickness, in accordance with AWWA C104/ANSI 21.4. Exposed pipe shall be polyurethane coated: apply 2 coats of a polyamide-cured epoxy resin finish at 2.5 to 3.5 dry mils, and 1 final coat of an aliphatic polyurethane enamel at 2.0 to 3.0 dry mils. Black in color.

2.04 WALL AND SLAB SLEEVES AND CASTING

A. At all points where pipes must pass through the walls, floors, or slabs of structures, CONTRACTOR shall furnish and install suitable sleeves or wall castings. Unless otherwise shown or permitted, the space between the pipe and the sleeve shall be sealed at the inside and outside wall faces on walls exposed to earth or water/sewage, at one face of other walls, and at the top surface of floors and slabs with a rubber link seal.

B. In general, the wall sleeve or castings shall be of the same material as the pipe. Iron pipe wall castings, wall pipe, transition sleeves, and solid sleeves shall meet the requirements of AWWA Specifications C100 and shall be of the lightest class conforming to the pressure rating of the pipelines which they connect, but in no case shall be lighter than Class B.

C. Steel sleeves and wall pipe shall not be painted in areas to be embedded in the concrete. Under this Section, all loose rust, scale, grease, or oil shall be removed prior to pouring of the concrete.

D. Where watertightness is essential and at other locations where indicated on Drawings, wall castings, and sleeves shall be provided with an intermediate flange located approximately at the center of the wall.

E. Sleeves and castings at the point of manufacture shall be coated on the inside with a universal rust-inhibitive primer 1.5 to 2.0 mils minimum dry thickness.

F. Rubber link seal shall be identical rubber links interconnected with bolts and elongated nuts and washers. The sealing element shall be made of synthetic rubber material especially compounded to resist aging, ozone, sunlight, and chemical action. Bolts and metal parts shall be made of galvanized or cadmium-plated steel to resist corrosion. Rubber link seal joints shall be submitted to ENGINEER for approval.

2.05 EQUIPMENT CONNECTIONS

A. The connecting piping to pumps and other equipment shall be supported independently of the pump or equipment so as to avoid any strain on the pump or equipment.

B. All equipment connections shall be flanged or have unions to facilitate removal of the equipment.

C. Piping to vibrating equipment shall contain control-rodded, retainer ringed flanges, flexible spool-type expansion joint of duct and chlorobutyl or Buna-N material as shown or noted on Drawings.

D. All carbon steel shall be galvanized.

2.06 JOINT RESTRAINT

A. Where water or air pressure exerts a disjoining force, at all pipe deflections over 20 degrees, and all tees and dead ends, joints shall be restrained, tied, or harnessed in a manner approved by ENGINEER.

B. The restraint shall be applied to joints in each direction from the deflection an adequate distance to resist the axial thrust of the test pressure as shown on Pipe Restraint Schedule on Drawings. Fire hydrants shall be restrained from the main line to the hydrant. Details of all proposed joint restraint, showing the type and locations, shall be submitted to ENGINEER for approval. Concrete thrust blocks will not be permitted except where noted. All pipe and fitting restrained joints shall be rated for a minimum of 250 psi.

C. For unit price items, joint restraint shall be considered as included in the prices Bid for the type and size of pipe listed on Bid Form.

D. Acceptable methods of joint restraint are as follows:
   1. Ductile Iron Pipe: Mechanical joint pipe with EBAA Iron "Megalug Series" shall be used when shown on Drawings. Megalugs retainers may also be used to restrain joints for unanticipated deflection points, or where connections require a mechanical joint. Restrained joint glands and hardware shall have surfaces factory prepared and protected with a corrosion resistant coating system. Glands shall have a polyester or epoxy fusion bonded coating. Wedges, nuts and bolts shall have two coats of a heat cured blue fluoropolymer coating or alternatively made of stainless steel. No other manufacturers or types of mechanical joint-retaining glands will be accepted. Push-on joint pipe shall be restrained with American Lok-Ring, Flex-ring or Fast-Grip Gaskets, U.S. Pipe TR Flex, or equal.

2.07 HANGERS AND SUPPORTS

A. Concrete supports shall be placed wherever shown or required under Division 3. Equipment shall be supported in accordance with manufacturer's recommendations.

2.08 TAPS AND PLUGS

A. Where indicated or required, pipe or fittings shall be tapped to receive small or special fittings under this or other headings of the Work. Required taps shall be provided as part of this Work.

B. All taps shall be temporarily plugged at point of fabrication.

2.09 SOURCE QUALITY CONTROL

A. Tests, Inspections:
   1. All pipe and fittings delivered to the Project shall be accompanied by certification papers showing that the pipe and fittings have been tested in accordance with the applicable Specifications and that pipe and fittings meet the Specifications for this Project. All pipe and fittings will be inspected upon delivery to the Site by ENGINEER or OWNER's Representative. No cracked, broken, or damaged pipe or fittings will be allowed in this Work.
   2. Ductile Iron Pipe:
      a. Each pipe shall be hydrostatically tested to 500 psi at the point of manufacture.
      b. The class of nominal thickness, net weight without lining, and casting period shall be clearly marked on each length of pipe. Additionally, the manufacturer's mark, county where cast, year in which the pipe was produced, and the letters "DI" or "ductile" shall be cast or stamped on the pipe.
      c. Where required, other designation marks shall be painted on the pipe or fittings to indicate correct location in the pipeline in conformity to a detailed layout plan.

PART 3 - EXECUTION

3.01 ERECTION

A. Equipment provided under this Section shall be fabricated, assembled, erected, and placed in proper operation condition in full conformity with detail Drawings, specifications, engineering data, instructions, and recommendations of equipment manufacturer approved by ENGINEER.

3.02 INSTALLATION

A. Laying and Erecting Pipe: Pipe shall be installed as recommended by manufacturers or by the applicable AWWA installation manual or specification.
   1. Pipe shall be carefully laid to line and grade as shown on Drawings. Care shall be taken to keep the interior of the pipe clean and free from dirt and other foreign materials.
   2. Bulkheads or other means shall be used at the open ends of the pipe for this purpose. At the end of each day's work, ground-buried pipe shall have its working end bulkheaded.
   3. Ground-buried ductile iron pipe shall be wrapped with polyethylene encasement in accordance with AWWA C105 (ANSI 21.5) following Method "A."

B. Field Cutting Piping: The spigot ends of all pipe lengths, which have been cut in the field, shall be ground to a smooth surface and painted with 2 coats of asphaltum metal protective paint.

C. Bedding: Where the subgrade is disturbed during excavation, the space shall be refilled with bedding material solidly tamped to form a firm foundation for the pipe.

1. At least the bottom quarter of the pipe shall be laid on a sand or pea gravel bedding, except that the bedding shall be exclusively pea gravel for pipe 48 inches and larger in diameter. Bedding shall be provided as specified under Division 2.

D. Joints: All joints shall be assembled in accordance with that described in the "Pipe Joints" Article.

E. Connections to Existing Facilities:
   1. CONTRACTOR shall furnish all labor and materials required for the connection of piping under this Contract to existing structures as called for on Drawings.
   2. Where breaking holes for connections to existing structures, care shall be taken to prevent debris from entering.
   3. After installation of the pipe, the structure shall be pointed up around the pipe, both on the inside and outside so that it is restored to a watertight condition.

F. Connections to Existing Mains: Where shown on Drawings, connections of existing main to the new mains shall be done only after the new mains are shown to be disinfected by the results of the bacteriological analysis. Care should be taken to prevent debris from entering the pipe.

3.03 REPAIR

A. Damaged linings, coatings, and wrapping shall be repaired under this Section and, if possible, before pipe is laid.
   1. Surfaces shall be thoroughly cleaned, dried, and free of old materials.
   2. They shall then be given a field coating of the same material as specified for the pipe.
   3. Coating shall meet the requirements of AWWA C203, AWWA C210, or AWWA C602 as approved by ENGINEER.
   4. All other pipe coatings and linings shall be as stated in "Piping" Article.

3.04 FIELD QUALITY CONTROL

A. Defective Pipe: No pipe or special casting known to be defective shall be laid in Work.
   1. Any piece found to be defective after it has been laid shall be removed by CONTRACTOR and replaced by a sound and perfect piece.
   2. If the major part of a defective pipe is sound, the good end may be cut off and used.
   3. The cutting of pipes for this and any other purpose shall be done by skilled workers, and in such manner as will not injure the pipe. Every such cut shall be square and smooth. Cut surfaces shall be recoated as specified for the pipe.

B. Tests:
   1. Pre-flushing
      a. Prior to flushing ductile iron force mains or associated ductile iron service lines, the Contractor shall "pig" the force main or service line using a low density, bare swab of the appropriate size. All ductile iron lines greater than 200' are required to be pigged prior to flushing unless otherwise approved by the Engineer. Line installations less than 200' do not require "pigging" prior to the flushing, pressure testing and disinfection process.
      b. The Contractor shall flush all new force mains prior to pressure testing and disinfecting for a length of time and with flow velocities adequate to flush foreign materials out of the pipe and valves. If foreign material is not removed and causes subsequent damage to the individual residence's/user's service or meter, the Contractor shall be solely responsible for all repairs to the individual residence's/user's service or meter.
   2. After completion, the pipe shall be tested by CONTRACTOR in the presence of ENGINEER. All appurtenances along the existing force main shall be tested with the run of pipe. All air relief valves shall be isolated prior to testing.
      a. Any leaks in new piping shall be made tight. Additional leakage shall be reported to the ENGINEER.
      b. Under this Work, CONTRACTOR shall furnish all water, piping, bulkheads, pumps or compressors, gauge, and other equipment required for the test.
      c. The section of pipe to be tested shall be cleaned and isolated by valves or plugs, and shall include the entire run of existing pipe between the manhole at the WTP and the manhole at the lagoon. Such valves or plugs shall be designed to hold against the test pressure. Sections of pipe shall have an opening through which air or water can be introduced. The supply line shall be fitted with suitable control valves and a pressure gauge for continually measuring the pressure. The pressure gauge shall have a minimum diameter of 3-1/2 inches and a range compatible with the test pressure. Pipelines that cannot be closed for a direct pressure test shall be tested by filling the tanks to which they are connected to the highest operating level or installing temporary test bulkheads. After completion of tests, all pipes shall be drained below frost level. New buried pipelines shall be pressure tested with all pipe joints exposed for visual inspection unless otherwise directed by ENGINEER.
      d. If requested by ENGINEER, CONTRACTOR shall furnish proposed test procedures for approval including pipe identification, test pressure and a description of the method of testing.
      e. In the event that the leakage exceeds the specified amount, the joints in the line shall be carefully inspected for leaks and repaired where necessary as directed by the ENGINEER. Any pipes or special castings found to be cracked shall be removed and replaced with new pieces by CONTRACTOR. After this Work has been done, the test shall be repeated. Final acceptance of the lines will not be made until satisfactory tests have been passed. Work to repair any leaks along the existing force main will be paid for in the Allowance for existing force main repairs.
   3. Test Pressures: In general, pipelines shall be tested at 1-1/2 times their working pressure or at the test pressure indicated on Piping Schedule. Adjustments for hydrotest water temperature and water column elevation differences at point of test must be made. Test pressure for the lime sludge force main shall be 100 psi.
   4. Hydrostatic Testing (except HDPE): The section of pipe to be tested shall be filled with water, the entrained air within the line shall be removed, and water shall be pressurized up to test pressure at the pipe low point within 5 to 10 minutes.
      a. The test period shall start immediately after initial pressurization. The line shall be maintained under the test pressure for a continuous 2-hour period.

b. The section of pipe to be tested shall hold the test pressure with no more than a 5 percent loss in pressure over the test period or the leakage per hour under the conditions of test shall not exceed values determined by the following equation:

$$L = \frac{SD\sqrt{P}}{148{,}000}$$

where L = allowable leakage per hour (gallons)
S = length of pipe in test (feet)
D = nominal diameter of pipe (inches)
P = average test pressure (psi, gauge)

c. Piping with flanged, grooved coupling, screwed, socket type, and welded joints shall be completely tight at the designated test pressure.
d. The test pressure shall not vary by more than 5 psi throughout the entire test period.

5. Each valve assembly shall be tested by CONTRACTOR; the test shall consist of opening and closing the valve.

END OF SECTION

SECTION 15 11 00 - PROCESS VALVES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Labor, materials, and equipment necessary for fabrication, production, installation, and erection of the items specified in this Section and as shown on Drawings or on Valve Schedule on Drawings.

1.02 REFERENCES

A. ANSI/AWWA:

1.	C110/A21.10	Ductile Iron and Gray Iron Fittings, 3-inch through 48-inch for Water and Other Liquids.
2.	C111/A21.11	Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings.
3.	C500	Gate Valves for Water and Sewage Systems.
4.	C517	Plug Valves.
5.	C504	Rubber Seated Butterfly Valves.
6.	C509	Resilient Seated Gate Valves for Water Supply Service.

B. ASTM:

1.	A 48	Specification for Gray Iron Castings.
2.	A 126	Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.
3.	A 182/A 183M	Specification for Forged or Rolled Alloy Steel Pipe Flanges, Forged Fittings and Valves and Parts for High Temperature Service.
4.	A 183	Specification for Carbon Steel Track Bolts and Nuts.
5.	A 194/194M	Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure and High Temperature Service.
6.	A 276	Specification for Stainless and Heat Resisting Steel Bars and Shapes.
7.	A 436	Specification for Austenitic Gray Iron Castings.
8.	A 536	Specification for Ductile Iron Castings.
9.	B 148	Specification for Aluminum Bronze Castings.
10.	B 584	Specification for Copper Alloy Sand Castings for General Applications.
11.	B 61	Specification for Steam of Bronze Castings.

1.03 SUBMITTALS

A. Shop Drawings: Submit in accordance with Section 01 33 00, Shop Drawings covering the items included under this Section. Shop Drawing submittals shall include:
   1. Each valve, including accessories, shall be identified on Shop Drawings by its respective mark as noted on Valve Schedule.

B. Operation and Maintenance Manuals: Submit in accordance with requirements of Section 01 60 00, operation and maintenance manuals for items included under this Section.

C. Warranty: Submit in accordance with requirements of Section 01 77 00, warranties covering the items included under this Section.

1.04 QUALITY ASSURANCE

A. All Work under this Section shall be performed in accordance with standard practices as recommended by manufacturer and AWWA.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with specified requirements, manufacturers offering products which may be incorporated in Work include:
   1. Plug Valves (P):
      a. Clow Valve Co.
      b. DeZurik.
      c. Milliken Valve Co.
      d. Val-Matic Valve and Manufacturing Co.
      e. Victaulic Co.

2.02 COMPONENTS

A. Plug Valves (P):
   1. Plug valves shall be nonlubricated, eccentric type with nitrile butadiene (hycar) or Buna-N resilient faced plugs. End connections shall generally be flanged or grooved for inside valves and mechanical joint for exterior ground-buried valves. Port areas shall be equal to at least 95 percent of the nominal size pipe area. Valve bodies shall be suitably marked to indicate whether the valve is open or closed.
   2. The seating surface of the valve body shall be welded in stainless steel or nickel. Bearings at the top and bottom supporting the rotating element shall be self-lubricating, corrosion-resistant type, suitable for sewage plant service. The valve shall be of the bolted bonnet design. Packing shall be visible for inspection without dismantling valve or removing operator. The packing shall be adjustable and replaceable without disassembling of the valve. The valve body shall be cast or ductile iron marked to show seat side of valve.
   3. Plug valves shall be of adequate design to operate with a pressure of 50 psi on both sides or on either side of the valve without leakage.

2.03 VALVE JOINTS

A. Mechanical joints shall conform to ANSI/AWWA C110/A 21.10 and ANSI/AWWA C111/A 21.11.

2.04 ACCESSORIES

A. Manual Operators: Operators shall be designed with a safety factor of 5 for torsional and shear stresses. The operating mechanism shall be so located and so designed that parts subject to the maintenance shall be easily accessible.
   1. Manual operators shall be so sized that a maximum of 80 pounds of rim force/pull is required for operation.
   2. Positions of operators shall be approved by ENGINEER.
   3. Valve shall be made to open when turned to the left or counterclockwise.
   4. The direction of the operator to open position shall be indicated on the operator.

5. Wrench heads shall be cast iron with setscrew. They shall be furnished for wrench nuts except where extension stems or T-handle wrenches are required.
6. Wrench nuts shall be provided with a 2-inch operating nut when a T-handle wrench or extension stem is required. Other wrench nuts shall be furnished with a wrench head.

B. Valve Box (Length): Valve boxes shall be cast iron. Cast iron lids shall be provided with valve boxes and shall be marked "WATER" in raised letters.
1. Cast iron boxes shall be of the 3-piece adjustable type. A Number 6 base shall be furnished with valves 8 inches or less, and a Number 160 base shall be provided for valves over 8 inches.
2. Cast iron material shall meet requirements of ASTM A 126-B or ASTM A 48, Class 30B.
3. Bolt material shall meet requirements of ASTM B 316 and B 253.
4. A magnet shall be permanently molded into both the upper and lower sections for easy locating with a dip needle or magnetic locator.
5. A brass identification tag shall be provided for secure installation inside the valve box cap. City to provide Valve IDs at the preconstruction conference.

C. Worm Gear: Worm gear operators shall meet the requirements of AWWA C504 operators.

PART 3 - EXECUTION

3.01 ERECTION

A. Equipment provided under this Section shall be fabricated, assembled, erected, and placed in proper operation condition in full conformity with detail drawings, specifications, engineering data, instructions, and recommendations of the equipment manufacturer approved by ENGINEER.

B. Equipment furnished under this Section shall be installed under Section 15 10 00.

3.02 FIELD QUALITY CONTROL

A. Installation: Special attention shall be given by CONTRACTOR to ensure that items furnished under this Section are installed in accordance with manufacturer's recommendations.

END OF SECTION

ATTACHMENTS

CITY OF ANN ARBOR
PREVAILING WAGE DECLARATION OF COMPLIANCE

The "wage and employment requirements" of Section 1:320 of Chapter 14 of Title I of the Ann Arbor City Code mandates that the city not enter any contract, understanding or other arrangement for a public improvement for or on behalf of the city unless the contract provides 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. Where the contract and the Ann Arbor City Code 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 1:320 of Chapter 14 of Title I of the Code of the City of Ann Arbor, employees shall be paid a prescribed minimum level of compensation (i.e. Living Wage) for the time those employees perform work on the contract in conformance with section 1:815 of Chapter 23 of Title I of the Code of the City of Ann Arbor.

At the request of the city, any contractor or subcontractor shall provide satisfactory proof of compliance with this provision.

The Contractor agrees:

(a) To pay each of its employees whose wage level is required to comply with federal, state or local prevailing wage law, for work covered or funded by this contract with the City,

(b) To require each subcontractor performing work covered or funded by this contract with the City to pay each of its employees the applicable prescribed wage level under the conditions stated in subsection (a) or (b) above.

(c) To provide to the City payroll records or other documentation within ten (10) business days from the receipt of a request by the City.

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

The undersigned states that he/she has the requisite authority to act on behalf of his/her employer in these matters and has offered to provide the services in accordance with the terms of the wage and employment provisions of the Chapter 14 of the Ann Arbor City Code. The undersigned certifies that he/she has read and is familiar with the terms of Section 1:320 of Chapter 14 of the Ann Arbor City Code and by executing this Declaration of Compliance obligates his/her employer and any subcontractor employed by it to perform work on the contract to the wage and employment requirements stated herein. The undersigned further acknowledges and agrees that if it is found to be in violation of the wage and employment requirements of Section 1:320 of the Chapter 14 of the Ann Arbor City Code it shall has be deemed a material breach of the terms of the contract and grounds for termination of same by the City.

_____
Company Name

_____
Signature of Authorized Representative Date

_____
Print Name and Title

_____
Address, City, State, Zip

_____
Phone/Email address

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

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 an employer who is (a) a contractor providing services to or for the City for a value greater than $10,000 for any twelve-month contract term, or (b) a recipient of federal, state, or local grant funding administered by the City for a value greater than $10,000, or (c) a recipient of financial assistance awarded by the City for a value greater than $10,000, shall pay its employees a prescribed minimum level of compensation (i.e., Living Wage) for the time those employees perform work on the contract or in connection with the grant or financial assistance. The Living Wage must be paid to these employees for the length of the contract/program.

Companies employing fewer than 5 persons and non-profits employing fewer than 10 persons are exempt from compliance with the Living Wage Ordinance. If this exemption applies to your company/non-profit agency please check here [___] *No. of employees__*

The Contractor or Grantee agrees:

(a) To pay each of its employees whose wage level is not required to comply with federal, state or local prevailing wage law, for work covered or funded by a contract with or grant from the City, no less than the Living Wage. The current Living Wage is defined as $13.22/hour for those employers that provide employee health care (as defined in the Ordinance at Section 1:815 Sec. 1 (a)), or no less than $14.75/hour for those employers that do not provide health care. The Contractor or Grantor understands that the Living Wage is adjusted and established annually on April 30 in accordance with the Ordinance and covered employers shall be required to pay the adjusted amount thereafter to be in compliance with Section 1:815(3).

Check the applicable box below which applies to your workforce

[___] Employees who are assigned to any covered City contract/grant will be paid at or above the applicable living wage without health benefits

[___] Employees who are assigned to any covered City contract/grant will be paid at or above the applicable living wage with health benefits

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

(b) To provide to the City payroll records or other documentation within ten (10) business days from the receipt of a request by the City.

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

(d) To take no action that would reduce the compensation, wages, fringe benefits, or leave available to any employee covered by the Living Wage Ordinance or any person contracted for employment and covered by the Living Wage Ordinance in order to pay the living wage required by the Living Wage Ordinance.

The undersigned states that he/she has the requisite authority to act on behalf of his/her employer in these matters and has offered to provide the services or agrees to accept financial assistance in accordance with the terms of the Living Wage Ordinance. The undersigned certifies that he/she has read and is familiar with the terms of the Living Wage Ordinance, obligates the Employer/Grantee to those terms and acknowledges that if his/her employer is found to be in violation of Ordinance it may be subject to civil penalties and termination of the awarded contract or grant of financial assistance.

Company Name	Street Address
Signature of Authorized Representative Date	City, State, Zip
Print Name and Title	Phone/Email address

CITY OF ANN ARBOR
LIVING WAGE ORDINANCE

RATE EFFECTIVE APRIL 30, 2018 - ENDING APRIL 29, 2019

$13.22 per hour
If the employer provides health care benefits*

$14.75 per hour
If the employer does **NOT** provide health care benefits*

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

ENFORCEMENT

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

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

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

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

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

Revised 2/1/2018

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 of interest policies as stated within the certification section below.

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

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

Conflict of Interest Disclosure*	
Name of City of Ann Arbor employees, elected officials or immediate family members with whom there may be a potential conflict of interest.	( ) Relationship to employee _____ ( ) Interest in vendor's company ( ) Other (please describe in box below)

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

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

Questions about this form? Contact Procurement Office City of Ann Arbor Phone: 734/794-6500, procurement@a2gov.org

CITY OF ANN ARBOR
DECLARATION OF COMPLIANCE

Non-Discrimination Ordinance

The "non discrimination by city contractors" provision of the City of Ann Arbor Non-Discrimination Ordinance (Ann Arbor City Code Chapter 112, Section 9:158) requires all contractors proposing to do business with the City to treat employees in a manner which provides equal employment opportunity and does not discriminate against any of their employees, any City employee working with them, or any applicant for employment on the basis of actual or perceived age, arrest record, color, disability, educational association, familial status, family responsibilities, gender expression, gender identity, genetic information, height, HIV status, marital status, national origin, political beliefs, race, religion, sex, sexual orientation, source of income, veteran status, victim of domestic violence or stalking, or weight. It also requires that the contractors include a similar provision in all subcontracts that they execute for City work or programs.

In addition the City Non-Discrimination Ordinance requires that all contractors proposing to do business with the City of Ann Arbor must satisfy the contract compliance administrative policy adopted by the City Administrator. A copy of that policy may be obtained from the Purchasing Manager

The Contractor agrees:

(a) To comply with the terms of the City of Ann Arbor's Non-Discrimination Ordinance and contract compliance administrative policy, including but not limited to an acceptable affirmative action program if applicable.

(b) To post the City of Ann Arbor's Non-Discrimination Ordinance Notice in every work place or other location in which employees or other persons are contracted to provide services under a contract with the City.

(c) To provide documentation within the specified time frame in connection with any workforce verification, compliance review or complaint investigation.

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

The undersigned states that he/she has the requisite authority to act on behalf of his/her employer in these matters and has offered to provide the services in accordance with the terms of the Ann Arbor Non-Discrimination Ordinance. The undersigned certifies that he/she has read and is familiar with the terms of the Non-Discrimination Ordinance, obligates the Contractor to those terms and acknowledges that if his/her employer is found to be in violation of Ordinance it may be subject to civil penalties and termination of the awarded contract.

_____
Company Name

_____
Signature of Authorized Representative Date

_____
Print Name and Title

_____
Address, City, State, Zip

_____
Phone/Email Address

Questions about the Notice or the City Administrative Policy, Please contact:
Procurement Office of the City of Ann Arbor
(734) 794-6500

CITY OF ANN ARBOR NON-DISCRIMINATION ORDINANCE

Relevant provisions of Chapter 112, Nondiscrimination, of the Ann Arbor City Code are included below.
You can review the entire ordinance at www.a2gov.org/humanrights.

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

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

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

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

Complaint Procedure: If any individual believes there has been a violation of this chapter, he/she may file a complaint with the City's Human Rights Commission. The complaint must be filed within 180 calendar days from the date of the individual's knowledge of the allegedly discriminatory action or 180 calendar days from the date when the individual should have known of the allegedly discriminatory action. A complaint that is not filed within this timeframe cannot be considered by the Human Rights Commission. To file a complaint, first complete the complaint form, which is available at www.a2gov.org/humanrights. Then submit it to the Human Rights Commission by e-mail (hrc@a2gov.org), by mail (Ann Arbor Human Rights Commission, PO Box 8647, Ann Arbor, MI 48107), or in person (City Clerk's Office). For further information, please call the commission at 734-794-6141 or e-mail the commission at hrc@a2gov.org.

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

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

Michigan Department
Of Transportation
CP-347 (04/10)

MICHIGAN DEPARTMENT OF TRANSPORTATION

CERTIFIED PAYROLL

COMPLETION OF CERTIFIED PAYROLL FORM FULFILLS THE MINIMUM MDOT PREVAILING WAGE REQUIREMENTS

(1) NAME OF CONTRACTOR / SUBCONTRACTOR (CIRCLE ONE)	(2) ADDRESS		
(3) PAYROLL NO.	(4) FOR WEEK ENDING	(5) PROJECT AND LOCATION	(6) CONTRACT ID

(a)	(b)	(c)	(d) DAY AND DATE							(e)	(f)	(g)	(h)	(i)	(j) DEDUCTIONS						(k)
EMPLOYEE INFORMATION	WORK CLASSIFICATION	Hour Type	HOURS WORKED ON PROJECT							TOTAL HOURS ON PROJECT	PROJECT RATE OF PAY	PROJECT RATE OF FRINGE PAY	GROSS PROJECT EARNED / GROSS WEEKLY EARNED	TOTAL WEEKLY HOURS WORKED ALL JOBS	FICA	FEDERAL	STATE		OTHER	TOTAL DEDUCT	TOTAL WEEKLY WAGES PAID FOR ALL JOBS
NAME:										0			$0.00							$0.00	$0.00
ETH/GEN: ID #:	GROUP/CLASS #:	S								0											
NAME:										0			$0.00							$0.00	$0.00
ETH/GEN: ID #:	GROUP/CLASS #:	S								0											
NAME:										0			$0.00							$0.00	$0.00
ETH/GEN: ID #:	GROUP/CLASS #:	S								0											
NAME:										0			$0.00							$0.00	$0.00
ETH/GEN: ID #:	GROUP/CLASS #:	S								0											
NAME:										0			$0.00							$0.00	$0.00
ETH/GEN: ID #:	GROUP/CLASS #:	S								0											
NAME:										0			$0.00							$0.00	$0.00
ETH/GEN: ID #:	GROUP/CLASS #:	S								0											
NAME:										0			$0.00							$0.00	$0.00
ETH/GEN: ID #:	GROUP/CLASS #:	S								0											
NAME:										0			$0.00							$0.00	$0.00
ETH/GEN: ID #:	GROUP/CLASS #:	S								0											

Date _____

I, _____ _____
(Name of Signatory Party) (Title)

do hereby state:

(1) That I pay or supervise the payment of the persons employed by

_____ on the
(Contractor or Subcontractor)

_____; that during the payroll period commencing on the
(Building or Work)

_____ day of _____, _____, and ending the _____ day of _____, _____,

all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said

_____ from the full
(Contractor or Subcontractor)

weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Start. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. § 3145), and described below:

_____

_____

_____

_____

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:

(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

☐ – in addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

☐ – Each laborer or mechanic listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS:

NAME AND TITLE	SIGNATURE

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE 31 OF THE UNITED STATES CODE.