

CITY OF ANN ARBOR
INVITATION TO BID



Orchard Hills Water Main Extension

ITB No. 4439

Due Date: Tuesday, June 2, 2016 at 2:00 PM (Local Time)

Public Services Area/Field Operations Unit

Issued By:

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

ADDENDUM No. 1

ITB No. 4439

Orchard Hills Water Main Extension

Due: Thursday, June 2, 2016 at 2:00 P.M. (local time)

The following changes, additions, and/or deletions shall be made to the Invitation to Bid for Orchard Hills Water Main Extension, ITB No. 4439, on which proposals will be received on/or before Thursday, June 2, 2016 at 2:00 P.M.

The information contained herein shall take precedence over the original documents and all previous addenda (if any), and is appended thereto. **This Addendum includes 17 pages.**

Bidder is to acknowledge receipt of this Addendum No. 1, including all attachments (if any) in its bid by so indicating on page ITB-1 of the Invitation to Bid Form. Bids submitted without acknowledgement of receipt of this addendum will be considered nonconforming.

The following forms provided within the ITB Document must be included in submitted bids at bid opening.

- **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.

I. CORRECTIONS/ADDITIONS/DELETIONS

Changes to the Bid documents which are outlined below are referenced to a page or Section in which they appear conspicuously. The Bidder is to take note in its review of the documents and include these changes as they may affect work or details in other areas not specifically referenced here.

Section/Page(s)	Change
Specification Section 02446 1.2 Submittals, A., 1.	1. CONTRACTOR's qualification information as described in Subsection 4-4 <u>1.3</u> .
Specifications Section 02446 1.5 Measurement and Payment Procedures	2. The "12" Storm Sewer , DR 11 HPDE, Directional Drill" pay item will be paid by the horizontally measured lineal feet (LF) of water main installed by directional drilling method measured along the axis of the storm sewer <u>water main</u> . The unit price shall include complete furnishing of all labor, materials and equipment for the installation of storm sewer <u>water main</u> by directional drilling method

Specifications Section 02446
3.5 Guided Drilling, A., 4

3. Equipment set-up requirements at the designated locations shall be determined by the CONTRACTOR and submitted to the ENGINEER per the requirements of Subsection ~~4.3~~ 1.2.

ATTACHED IS THE PRE-BID MEETING ATTENDANCE SHEET

ATTACHED ARE THE SOIL BORING LOGS FOR SB1 AND SB2 AS SHOWN ON THE PLANS

II. QUESTIONS AND ANSWERS

The following Questions have been received by the City. Responses are being provided in accordance with the terms of the ITB. Respondents are directed to take note in its review of the documents of the following questions and City responses as they affect work or details in other areas not specifically referenced here.

Question 1: Will data logging of the fusion joints be required?

Answer 1: Yes, per specification Section 02446 Subsection 3.3 Joining of High Density Polyethylene (HDPE) Pipe paragraph E. and paragraph H., 4.

Question 2: What is the proper sequence of water main?

Answer 2: For this project, the new water main is separated from the existing water main by the existing gate valve in well therefore EITHER METHOD of testing is acceptable as outlined in specification Section 02500, Subsection 14 depending on Contractor's preferred method of installation and connection to existing water main. However, per specification section 02500, subsection 16 Flushing and Swabbing, the City's preferred method for pushing the pig through the main is the Connected Water Main Sequence.

Question 3: Will the new water main need to have a poly-pig pushed through?

Answer 3: Yes, a poly-pig shall be used meeting the material and installation requirements of specification Section 02500, Subsection 16. Additionally, the poly-pig should be in place prior to the connection to the existing water main.

Question 4: Will a meter be required from the City for the water main testing?

Answer 4: The initial flushing of the main to push the swab (poly-pig) through the main will be unmetered. All other testing and any water used for the directional drilling operation should be done using 1" corporation that will be installed on the existing water main inside the existing gate valve well. Contractor will be required to obtain a meter and backflow prevention assembly from the City for all water pulled from 1" corporation.

Question 5: Is fusible PVC pipe an acceptable alternative to the fusible HDPE pipe?

Answer 5: No. Due to the alignment fusible PVC is NOT an acceptable alternative to the HDPE pipe.

Question 6: Is there an Engineers Estimate of Probable Construction Costs available for this project?

Answer 6: No. For bidding purposes, an EEOPCC is NOT available for this project.

Question 7: When pulling back, the reamer may try and wander off the proposed alignment at the bend will this be acceptable?

Answer 7: Some wandering off the proposed alignment will be allowed, however the new water main MUST remain in the 30 foot wide easement. If the Contractor anticipates the reamer to wander at the bend, the Contractor may choose to push rods out slightly off the proposed alignment at the bend to ensure that the proposed water main remains in the easement after pulling back.

Offerors are responsible for any conclusions that they may draw from the information contained in the Addendum.

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ATTACHMENTS

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

DRAWINGS

<u>SHEET</u>	<u>DRAWING NO.</u>	<u>TITLE</u>
1	G-01	COVER SHEET
2	G-02	GENERAL NOTES AND LEGEND
3	G-03	STANDARD DETAILS SHEET 1
4	C-01	WATER MAIN PLAN
5	C-02	WATER MAIN PROFILE

NOTICE OF PRE-BID CONFERENCE

A pre-bid conference for this project will be held on Thursday, May 19, 2016 at 10:00 AM at the City of Ann Arbor Wheeler Service Center, Conference Room B located at 4251 Stone School Road, Ann Arbor, Michigan 48108.

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 Clarification on ITB Specifications

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

All questions shall be due on or before Monday, May 23, 2016 at 5:00 PM and should be addressed as follows:

Specification/Scope of Work questions emailed to ted.warrowiii@stantec.com
Bid Process and HR 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 Ted Warrow at Stantec Consulting Michigan Inc. at ted.warrowiii@stantec.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 Thursday, June 2, 2016 at 2:00 PM local time. Bids submitted late or via oral, telephonic, telegraphic, electronic mail or facsimile **will not** be considered or accepted.

Each Bidder must submit one (1) original Bid and two (2) Bid copies in a sealed envelope clearly marked: **ITB No. 4439 Orchard Hills Water Main Extension**.

Bids must be addressed and delivered to:

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

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

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.

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.

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

Liquidated Damages

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

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

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

Human Rights Information

All contractors proposing to do business with the City shall satisfy the contract compliance administrative policy adopted by the City Administrator in accordance with the Section 9:158 of the Ann Arbor City Code. Breach of the obligation not to discriminate as outlined in Section 5, beginning at page GC-3 shall be a material breach of the contract. Contractors are required to post a copy of Ann Arbor's Non-Discrimination Ordinance attached at all work locations where its employees provide services under a contract with the City.

Wage Requirements

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

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

Conflict Of Interest Disclosure

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

Major Subcontractors

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

Debarment

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

Disclosures

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

Bid Protest

All Bid protests must be in writing and filed with the Purchasing Agent within five (5) business days of the award action. The bidder must clearly state the reasons for the protest. If a bidder contacts a City Service Area/Unit and indicates a desire to protest an award, the Service

Area/Unit shall refer the bidder to the Purchasing Agent. The Purchasing Agent will provide the bidder with the appropriate instructions for filing the protest. The protest shall be reviewed by the City Administrator or designee whose decision shall be final.

Cost Liability

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

Reservation of Rights

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

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 1, 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 2nd DAY OF June, 2016.

Verdeterre Contracting, Inc.

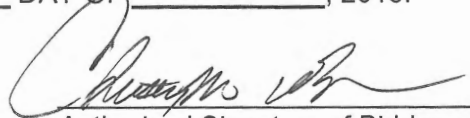
Bidder's Name

2618 Hannan Road
Canton, MI 48188

Official Address

734/697-4166

Telephone Number



Authorized Signature of Bidder

Christopher K. Brown

(Print Name of Signer Above)

Chris@verdeterre.net

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 Michigan, for whom Christopher K. Brown, bearing the office title of President, 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 6/21/2016, 2016

(Print) Name Christopher K. Brown Title President

Company: Verdeterre Contracting, Inc.

Address: 2618 Hannan Road, Canton, MI 48188

Contact Phone (734) 697-4166 Fax (734) 697-2809

Email Chris@verdeterre.net

BID FORM

Section 1 – Schedule of Prices

Project: Orchard Hills Water Main Extension
ITB #4439

Bidder's Name: Verdeterre Contracting, Inc.

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.

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
130	Protective Fencing	770	LF	\$ 4.00	\$ 3,080.00
140	Exploratory Excavations (0-10 foot deep)	3	EA	\$ 645.00	\$ 1,935.00
200	Soil Erosion Control (mudmat)	1	LS	\$ 1,365.00	\$ 1,365.00
201	General Conditions, Max. 10% of Bid	1	LS	\$ 14,500.00	\$ 14,500.00
202	Audiovisual Tape Coverage	1	LS	\$ 2,245.00	\$ 2,245.00
203	Minor Traffic Control	1	LS	\$ 2,400.00	\$ 2,400.00
400	12-inch, Class 50 DIP w/Polyethylene Wrap, Trench Type V	29	LF	\$ 128.50	\$ 3,726.50
402	6-inch, Class 50 DIP w/Polyethylene Wrap, Trench Type V	3	LF	\$ 80.00	\$ 240.00
410	12-inch, 45° Bend, DIP	2	EA	\$ 1,105.00	\$ 2,210.00
440	Fire Hydrant Assembly	1	EA	\$ 6,625.00	\$ 6,625.00
442	12-inch Gate Valve In Well	1	EA	\$ 6,195.00	\$ 6,195.00

Item No.	Item Description	Qty	Unit	Unit Price	Total Price
445	Repair Existing Gate Well	1	EA	\$ 425.00	\$ 425.00
475	12-inch, DR 11 HPDE, Directional Drill	700	LF	\$ 107.50	\$ 75,250.00
476	HDPE to Ductile Iron Transition	2	EA	\$ 2,000.00	\$ 4,000.00
480	Water Main, Connect to Existing	1	EA	\$ 3,705.00	\$ 3,705.00
523	23A Aggregate - CIP	160	CY	\$ 57.95	\$ 9,272.00
703	Soil Erosion, Silt Fence	470	LF	\$ 4.00	\$ 1,880.00
891	Clean-Up and Restoration	1	LS	\$ 14,240.00	\$ 14,240.00
TOTAL BID					\$ 153,293.50

TOTAL BID AMOUNT

ONE HUNDRED FIFTY-THREE THOUSAND, TWO HUNDRED NINETY-THREE ^{DOLLARS AND FIFTY CENTS} Dollars (\$ 153,293.50)

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

BID FORM

Section 2 - Material and Equipment Alternates

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

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

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

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

Signature of Authorized Representative of Bidder



Date 6/12

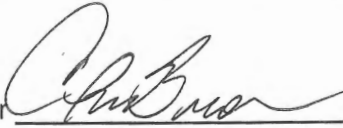
BID FORM

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 8/2

BID FORM

Section 4 - Major Subcontractors

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

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

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

<u>Subcontractor (Name and Address)</u>	<u>Work</u>	<u>Amount</u>
Full Bore Directional Boring, Inc. 6105 Birch Road Flint, MI 48507	Drill Work	To Be Determined

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 2 years.

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

1) East River WM Project \$2,006,193 May 2016
Project Name Cost Date Constructed
Grosse Ile, MI

Township of Grosse Ile 734/676-4422
Contact Name Phone Number

2) Old U.S. 23 WM Ext. \$1,474,329 June 2015
Project Name Cost Date Constructed
Brighton, MI

Township of Brighton 810/229-0550
Contact Name Phone Number

3) 8 Mile Road WM Ext. \$1,561,469 May 2015
Project Name Cost Date Constructed
Lyon Township, MI

Lyon Township 248/437-2240
Contact Name Phone Number

CONTRACT

THIS AGREEMENT is made on the _____ day of _____, 2016, between the CITY OF ANN ARBOR, a Michigan Municipal Corporation, 301 East Huron Street, Ann Arbor, Michigan 48104 ("City") and Verdeterre Contracting, Inc. ("Contractor") a corporation organized and doing business under the laws of the State of Michigan at 2618 Hannan Road, Canton, MI 48188.

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 Orchard Hills Water Main Extension, ITB No. 4439 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)	General Conditions
Vendor Conflict of Interest Form	Standard Specifications
Prevailing Wage Declaration of Compliance Form (if applicable)	Detailed Specifications
Bid Forms	Plans
Contract and Exhibits	Addenda
Bonds	

ARTICLE II - Definitions

Administering Service Area/Unit means Public Services Area/Public Works Services Unit

Project means Orchard Hills Water Main Extension ITB No. 4439

ARTICLE III - Time of Completion

- (A) The work to be completed under this Contract shall begin immediately on the date specified in the Notice to Proceed issued by the City.
- (B) The entire work for this Contract shall be completed within sixty (60) consecutive calendar days.
- (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:

One Hundred Fifty-Three Thousand Two Hundred Ninety-Three and 50/100 Dollars (\$153,293.50)

- (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 Lazarus
City Administrator

By _____
Craig Hupy
Public Services Area Administrator

[signatures continue on next page]

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 _____, 2016, 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 _____, 2016.

(Name of Surety Company)

By _____
(Signature)

Its _____
(Title of Office)

Approved as to form:

Stephen K. Postema, City Attorney

(Name of Principal)

By _____
(Signature)

Its _____
(Title of Office)

Name and address of agent:

LABOR AND MATERIAL BOND

- (1) _____
of _____(referred to as "Principal"), and _____, a corporation duly authorized to do business in the State of Michigan, (referred to as "Surety"), are bound to the City of Ann Arbor, Michigan (referred to as "City"), for the use and benefit of claimants as defined in Act 213 of Michigan Public Acts of 1963, as amended, being MCL 129.201 et seq., in the amount of \$ _____, for the payment of which Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by this bond.
- (2) The Principal has entered a written Contract with the City, dated _____, 2016, 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 _____, 2016

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

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

Approved as to form:

Name and address of agent:

Stephen K. Postema, City Attorney

GENERAL CONDITIONS

Section 1 - Execution, Correlation and Intent of Documents

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

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

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

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

Section 2 - Order of Completion

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

Section 3 - Familiarity with Work

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

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

Section 4 - Wage Requirements

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

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

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

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, the Contractor agrees to conform to Chapter 23 of Title I of the Code of the City of Ann Arbor, as amended, which in part states:

1:814. Applicability.

- (1) This Chapter shall apply to any person that is a contractor/bidder or grantee as defined in Section 1:813 that employs or contracts with five (5) or more individuals; provided, however, that this Chapter shall not apply to a non-profit contractor/bidder or non-profit grantee unless it employs or contracts with ten (10) or more individuals.
- (2) This Chapter shall apply to any grant, contract, or subcontract or other form of financial assistance awarded to or entered into with a contractor/bidder or grantee after the effective date of this Chapter and to the extension or renewal after the effective date of this Chapter of any grant, contract, or subcontract or other form of financial assistance with a contractor/bidder or grantee.

1:815. Living Wages Required.

- (1) Every contractor/bidder or grantee, as defined in Section 1:813, shall pay its covered employees a living wage as established in this Section.
 - (a) For a covered employer that provides employee health care to its employees, the living wage shall be \$12.93 an hour, or the adjusted amount hereafter established under Section 1:815(3).
 - (b) For a covered employer that does not provide health care to its employees, the living wage shall be \$14.43 an hour, or the adjusted amount hereafter established under Section 1:815(3).
- (2) In order to qualify to pay the living wage rate for covered employers providing employee health care under subsection 1:815(1)(a), a covered employer shall furnish proof of said health care coverage and payment therefor to the City Administrator or his/her designee.
- (3) The amount of the living wage established in this Section shall be adjusted upward no later than April 30, 2002, and every year thereafter by a percentage equal to the percentage increase, if any, in the federal poverty guidelines as published by the United States Department of Health and Human Services for the years 2001 and 2002. Subsequent annual adjustments shall be based upon the percentage increase, if any, in the United States Department of Health and Human Services poverty guidelines when comparing the prior calendar year's poverty guidelines to the present calendar year's guidelines. The applicable percentage amount will be converted to an amount in cents by multiplying the existing wage under Section 1.815(1)(b) by said percentage, rounding upward to the next cent, and adding this amount of cents to the existing living wage levels established under Sections 1:815(1)(a) and 1:815(1)(b). Prior to April 1 of each

calendar year, the City will notify any covered employer of this adjustment by posting a written notice in a prominent place in City Hall, and, in the case of a covered employer that has provided an address of record to the City, by a written letter to each such covered employer.

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

Section 5 - Non-Discrimination

The Contractor agrees to comply, and to require its subcontractor(s) to comply, with the nondiscrimination provisions of Section 209 of the Elliot-Larsen Civil Rights Act (MCL 37.2209). The Contractor further agrees to comply with the nondiscrimination provisions of Chapter 112 of the Ann Arbor City Code and to assure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity. The Contractor further agrees to comply with the provisions of Section 9:158 of Chapter 112 of the Ann Arbor City Code and in particular the following excerpts:

9:158. - Nondiscrimination by city contractors.

- (1) 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.
- (2) 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.
- (3) Upon request, each prospective contractor shall submit to the city data showing current total employment by occupational category, sex and minority group and shall respond to information requests documenting its equal employment opportunity policies and procedures.
- (4) If the contract which is being awarded includes federal requirements for affirmative action, each prospective contractor shall submit to the city data showing current total employment by occupational category, sex and minority group. If, after verifying this data, the City Administrator's designee concludes that it indicates total minority and female employment commensurate with their availability within the contractor's labor recruitment area, i.e., the area from which the contractor can reasonably be expected to recruit, said contractor shall be accepted by the City Administrator's designee as having fulfilled affirmative action requirements for the period of the contract at which time the City Administrator's designee shall conduct another review. If the data demonstrates an under-representation the contractor shall develop an affirmative action program for review by the City Administrator's designee. Said program shall include specific goals and timetables for the hiring and promotion of minorities and females. Said goals shall reflect the availability of minorities and females within the contractor's labor recruitment area. In the case of construction contractors, the City Administrator's designee shall use for employment verification the labor recruitment area of the Ann Arbor metropolitan statistical area. Construction contractors determined to be in compliance shall be accepted by the City Administrator's designee as having fulfilled affirmative action requirements for a period of 1 year at which time the City Administrator's designee shall conduct another review.
- (5) In hiring for construction projects, contractors shall make good faith efforts to employ local persons, so as to enhance the local economy.

- (6) All contracts shall include provisions through which the contractor agrees to follow all applicable federal and state laws.
- (7) The City Administrator's designee shall monitor the compliance of each contractor with the nondiscrimination provisions of each contract. The City Administrator's designee, together with the Human Rights Commission, shall develop procedures and regulations consistent with the administrative policy adopted by the City Administrator for notice and enforcement of non-compliance. Such procedures and regulations shall include a provision for the posting of contractors not in compliance.
- (8) The City Administrator's designee will provide the City's Human Rights Commission with an annual summary report of contracts awarded; affirmative action requirements reviewed, where applicable; any complaints received alleging violation of the contractor's non-discrimination requirements, and actions taken. The Human Rights Commission will be provided, at its request, with additional information related to the report. The Human Rights Commission and the City Administrator's designee will report annually to the City Council on compliance of city contractors with this chapter.
- (9) All city contracts shall provide further that breach of the obligation not to discriminate shall be a material breach of the contract for which the city shall be entitled, at its option, to do any or all of the following:
 - (a) Cancel, terminate, or suspend the contract in whole or part and/or refuse to make any required periodic payments under the contract;
 - (b) Declare the contractor ineligible for the award of any future contracts with the city for a specified length of time;
 - (c) Recover liquidated damages of a specified sum, said sum to be that percentage of the labor expenditure for the time period involved which would have accrued to protected class members had the discrimination provisions not been breached;
 - (d) Impose for each day of non-compliance, liquidated damages of a specified sum, based upon the following schedule:

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

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

(Ord. No. 14-25, § 1, 10-20-14)

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 13. No claim shall be valid unless so made.

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

- (1) The Contractor shall be reimbursed for all reasonable costs incurred in doing the work, and shall receive an additional payment of 15% of all the reasonable costs to cover both its indirect overhead costs and profit;
- (2) The term "Cost" shall cover all payroll charges for employees and supervision required under the specific order, together with all worker's compensation, Social Security, pension and retirement allowances and social insurance, or other regular payroll charges on same; the cost of all material and supplies required of either temporary or permanent character; rental of all power-driven equipment at agreed upon rates, together with cost of fuel and supply charges for the equipment; and any costs incurred by the Contractor as a direct result of executing the order, if approved by the Supervising Professional;
- (3) If the extra is performed under subcontract, the subcontractor shall be allowed to compute its charges as described above. The Contractor shall be permitted to add an additional charge of 5% percent to that of the subcontractor for the Contractor's supervision and contractual responsibility;
- (4) The quantities and items of work done each day shall be submitted to the Supervising Professional in a satisfactory form on the succeeding day, and shall be approved by the Supervising Professional and the Contractor or adjusted at once;
- (5) Payments of all charges for work under this Section in any one month shall be made along with normal progress payments. Retainage shall be in accordance with Progress Payments-Section 16.

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

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

Section 16 - Progress Payments

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

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

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

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

Section 17 - Deductions for Uncorrected Work

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

Section 18 - Correction of Work Before Final Payment

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

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

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

Section 19 - Acceptance and Final Payment

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

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

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

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

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

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

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

Section 20 - Suspension of Work

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

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

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

If the Contractor refuses or fails to prosecute the work, or any separate part of it, with the diligence required to insure completion, ready for operation, within the allowable number of consecutive calendar days specified plus extensions, or fails to complete the work within the

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

If the Contractor is adjudged a bankrupt, or if it makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of its insolvency, or if it persistently or repeatedly refuses or fails except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or if it fails to make prompt payments to subcontractors or for material or labor, or persistently disregards laws, ordinances or the instructions of the Supervising Professional, or otherwise is guilty of a substantial violation of any provision of the Contract, then the City, upon the certificate of the Supervising Professional that sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the Contractor 3 days written notice, terminate this Contract. The City may then take possession of the premises and of all materials, tools and appliances thereon and without prejudice to any other remedy it may have, make good the deficiencies or finish the work by whatever method it may deem expedient, and deduct the cost from the payment due the Contractor. The Contractor shall not be entitled to receive any further payment until the work is finished. If the expense of finishing the work, including compensation for additional managerial and administrative services exceeds the unpaid balance of the Contract Sum, the Contractor and its surety are liable to the City for any excess cost incurred. The expense incurred by the City, and the damage incurred through the Contractor's default, shall be certified by the Supervising Professional.

Section 22 - Contractor's Right to Terminate Contract

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

Section 23 - City's Right To Do Work

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

Section 24 - Removal of Equipment and Supplies

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

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

Section 25 - Responsibility for Work and Warranties

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

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

The Contractor shall assign all manufacturer or material supplier warranties to the City prior to final payment. The assignment shall not relieve the Contractor of its obligations under this paragraph to correct defects.

Section 26 - Partial Completion and Acceptance

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

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

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

Section 27 - Payments Withheld Prior to Final Acceptance of Work

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

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

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

Section 28 - Contractor's Insurance

- (1) The Contractor shall procure and maintain during the life of this Contract, including the guarantee period and during any warranty work, such insurance policies, including those set forth below, as will protect itself and the City from all claims for bodily injuries, death or property damage which may arise under this Contract; whether the acts were made by the Contractor or by any subcontractor or anyone employed by them directly or indirectly. The following insurance policies are required:
 - (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. 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. 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. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles. Further, the limits of liability shall be \$1,000,000 for each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.

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

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 Orchard Hills Water Main Extension, 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.

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.

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

Copies of the Standard Specifications can also be downloaded from the web link:

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

DETAILED SPECIFICATIONS

SECTION 01000

GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Work under this Contract consists of installation of water main by open cut construction, water main installation by directional drilling, installation of appurtenances and related restoration work.
- B. All work under this Contract shall be completed in accordance with the City of Ann Arbor Public Services Department Standard Specifications, unless otherwise amended within the Detailed Specifications or Contract Drawings.

1.2 WORK SCHEDULE

- A. The CONTRACTOR shall provide a work schedule. The schedule shall be complete and shall show in detail the manner in which he proposes to complete the work under this Contract and approximately monthly billing of the Contract. The purpose of the schedule is to assist the OWNER in notifying the public of inconveniences and to anticipate cash-flow on the job, and to determine if the CONTRACTOR is reasonably proceeding with the work to assure completion within the specified time.
- B. As a guide in preparing a construction sequence for the most significant portions of the project, the CONTRACTOR shall use the following in addition to the detailed sequence on the plans. All other proposed improvements may be constructed concurrently in accordance with an approved schedule.
 - 1. Exploration and coordination of existing utilities.
 - 2. Clearing and grubbing of alignment including necessary tree removals and topsoil stockpiling.
 - 3. Sawcut and remove existing pavement and curb & gutter.
 - 4. Install new water main.
 - 5. Construct proposed scour hole.
 - 6. Perform final restoration activities.

1.3 MATERIAL AND QUALITY CONTROL TESTING

- A. CONTRACTOR shall be responsible for providing, paying for, coordinating and scheduling the services of an independent testing firm (acceptable to OWNER) to perform all materials and compaction testing and related tasks.
- B. Independent testing firm will provide the testing services listed below. Any additional required by the Contract Documents beyond what is listed, shall be provided by the CONTRACTOR.
 - 1. Backfill
 - a. Sieve analysis per source.
 - b. Proctor per source.
 - c. Compaction testing at 400 SF intervals per lift, as required.

2. Aggregate Base
 - a. Sieve analysis per source.
 - b. Proctor per source.
 - c. Compaction testing once per 1,000 SF of placement.

 3. Asphalt Pavement
 - a. Temperature
 - b. Extraction per day.
 - c. Thickness and density once per 1,000 SF of placement.

 4. Concrete
 - a. Temperature, per 50 CYD.
 - b. Slump, per 50 CYD.
 - c. Air entrainment, per 50 CYD.
 - d. Comprehensive strength, per 50 CYD. Four (4) cylinders each with laboratory testing.
- C. Acceptable testing companies for selection by the CONTRACTOR are:
1. CTI (Brighton, Michigan; Telephone: (248) 486-5100)
 2. SME (Plymouth, Michigan; Telephone: (734) 454-9900)
 3. PSI (Plymouth, Michigan; Telephone: (734) 453-7900)
 4. TEC (Ann Arbor, Michigan; Telephone: (734) 623-0400)

1.4 COORDINATION AND COOPERATION WITH OTHERS

- A. The CONTRACTOR is reminded as to the requirements of article 104.07 of the 2012 edition of the MDOT Standard Specifications, "Cooperation by the CONTRACTOR." The CONTRACTOR shall directly coordinate his/her work with individual City Departments/Divisions/Units.

- B. The following Utility OWNERS may have overhead and/or underground facilities located within the Right-of-Way:
 1. The City of Ann Arbor
 2. DTE - MichCon (Michigan Consolidated Gas Company)
 3. DTE - Edison (Detroit Edison Company)
 4. AT&T
 5. Comcast
 6. MCI Communications
 7. Sprint Communications
 8. The University of Michigan
 9. Ann Arbor Railroad

1.5 PROTECTION OF EXISTING UTILITIES

- A. Damages to utilities by the CONTRACTOR's operations shall be repaired by the utility OWNER at the CONTRACTOR's expense. Delays to the work due to utility repairs are the sole responsibility of the CONTRACTOR. The CONTRACTOR shall keep construction debris out of utilities at all times. The CONTRACTOR shall be back charged an amount of \$50.00 per day for each manhole/inlet/utility pipe that contains construction debris caused as a result of the CONTRACTOR's (including subcontractors and

suppliers) work. The CONTRACTOR is solely responsible for any damages to the utilities or abutting properties due to construction debris.

- B. Certain sanitary and storm sewers within the influence of construction may have been cleaned and videotaped prior to construction. The City may also choose to videotape utility line(s) during or after the work of this Contract to inspect them for damages and/or construction debris. If such inspection shows damage and/or debris, then all costs of such inspection, cleaning, repairs, etc, shall be the CONTRACTOR's sole responsibility. If such inspection is negative, the City will be responsible for the costs of such inspection.
- C. Costs for this work will not be paid for separately, but shall be included in the bid price of the Contract Item "General Conditions".

1.6 CONSTRUCTION STAKING

- A. The CONTRACTOR will be required to contact the ENGINEER for staking 48 hours in advance of necessary staking. The ENGINEER will provide construction staking, in accordance with the GENERAL CONDITIONS for the complete project only one time. Any and all stakes that are destroyed or tampered with after staking are to be replaced at the CONTRACTORS expense.

1.7 AUDIO/VISUAL TAPE COVERAGE

- A. The CONTRACTOR shall furnish to the OWNER, an audio-video DVD recording for all areas proposed for improvement.
- B. The audio-video recording shall be DVD and of such quality to accurately describe the existing conditions. The DVD shall be produced one (1) week prior to the placement of materials or equipment in the construction area. The DVD shall be of commercial quality and of size commonly used. File format shall be .wmv or .mpg. Files submitted in .mp4 and other iOS formats will not be accepted.
- C. Both sides of the entire area must be recorded with the rate of speed less than 48 ft per minute. Camera functions such as panning rate; zoom-in/zoom-out shall be controlled to provide optimum object clarity.
- D. The DVD must be recorded while the visibility is clear and at no time will it be allowed during periods of ground cover.
- E. The DVD shall be continuous running and shall include date, time, and location at appropriate intervals. The location shall be easily referenced to the Contract Drawings.
- F. The audiovisual tape shall be paid on a lump sum basis and shall include all labor, equipment, and materials required to perform the filming and to provide the finished DVD to the ENGINEER. The unit price includes filming the entire project limits, for each and every street, as described above.

1.8 GENERAL CONDITIONS, INSURANCE, BONDS, & MOBILIZATION

- A. This pay item shall include all work described and required by the Plans and Specifications for which no item of work is listed in the Bid Form, including but not limited to:
 - 1. Scheduling and organization of all work, subcontractors, suppliers, testing, inspection, surveying, and staking.

ORCHARD HILLS WATER MAIN EXTENSION

2. Coordination of, and cooperation with, other CONTRACTORS, agencies, departments, and utilities.
 3. Protection and maintenance of Utilities.
 4. Maintaining drainage.
 5. Maintaining driveways drive openings, sidewalks, bike paths, mail deliveries, and solid waste/recycle pick-ups. This includes the placement and maintenance of gravel in driveway openings as directed by the ENGINEER.
 6. Storing all materials and equipment off lawn areas.
 7. Temporary relocation and final replacement/re-setting of mailboxes.
 8. Site clean-up.
 9. Coordination efforts to furnish various HMA mixtures as directed by the ENGINEER.
 10. Coordination efforts to furnish and operate various-size vehicles/equipment as directed by the ENGINEER.
 11. Furnishing and operating vacuum-type street cleaning equipment a minimum of once per week or more frequently as directed by the ENGINEER.
 12. Furnishing and operating vacuum-type utility structure cleaning equipment.
 13. Furnishing and operating both vibratory plate and pneumatic-type ("pogo-stick") compactors.
 14. Furnishing and operating a backhoe during all work activities.
 15. Furnishing and operating a jackhammer and air compressor during all work activities.
 16. Noise and dust control.
 17. Mobilization(s) and demobilization(s).
 18. Furnishing submittals and certifications for materials and supplies.
 19. Disposing of Excavated Materials and Debris - The CONTRACTOR shall dispose of, at the CONTRACTOR's expense, all excavated material. Costs for this work will not be paid for separately.
 20. Independent material testing.
 21. All miscellaneous and incidental items such as overhead, bonds, insurance, and permits.
- B. 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

ORCHARD HILLS WATER MAIN EXTENSION

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.

1.9 CLEAN-UP & RESTORATION

- A. This item of work shall conform to Division IX, Section II, Item No. 891, Clean-Up & Restoration of the Public Services Area Standard Specifications, except as specified herein.
- B. This work shall include the removal of all surplus materials from the site including; but not limited to; tools, dirt, rubbish, construction debris, and excess excavated material. This work shall also include the restoration of all existing lawn areas, road surfaces, culverts, drives, and sidewalks disturbed by the work. This work includes placing topsoil, fertilizer, seeding, and furnishing and installing mulch blankets on all disturbed areas as approved by the ENGINEER. Mulch blankets are required on all seeded areas.
- C. It is the responsibility of the CONTRACTOR to establish a dense lawn of permanent grasses, free from mounds and depressions prior to final acceptance and payment of this project. Any portion of a seeded area that fails to show a uniform germination shall be reseeded. Such reseeding shall be at the CONTRACTOR's expense and shall continue until a dense lawn is established. The CONTRACTOR is responsible for restoring all areas disturbed by his construction.
- D. The CONTRACTOR shall maintain all lawn areas until they have been accepted by the ENGINEER. Lawn maintenance shall begin immediately after the grass seed is in place and continue until final acceptance with the following requirements: Lawns shall be protected and maintained by watering, mowing, and reseeding as necessary, until the period of time when the final acceptance and payment is made by the ENGINEER for the project, to establish a uniform, weed-free, stand of the specified grasses. Maintenance includes furnishing and installing additional topsoil, and reseeding all as may be required to correct all settlement and erosion until the date of final acceptance.
- E. Damage to seeded areas resulting from erosion shall be repaired by the CONTRACTOR at the CONTRACTOR's expense. Scattered bare spots in seeded areas will not be allowed over three (3) percent of the area nor greater than 6"x 6" in size. When the above requirements have been fulfilled, the ENGINEER will accept the lawn.
- F. Measurement and payment for this item of work shall conform to Division IX, Section 2, Item No. 891, Clean-Up & Restoration of the Public Services Area Standard Specifications except as modified herein.
- G. The completed work for "Clean-up and Restoration" will be paid for on a lump sum (LS) basis. 80% of said lump sum shall be paid upon completion and approval of the site by the ENGINEER. By May 31st of the year following the completion of the project, the ENGINEER will inspect the seeded turf to ensure that the end product is well established; weed free, and in a growing and vibrant condition. If the ENGINEER determines that the restored areas meet the project requirements, the remaining 20% of the lump sum will be paid. If the ENGINEER determines that the restored areas do not meet the project requirements, the CONTRACTOR will continue with any and all measures necessary to meet the project requirements. All costs associated with the remedial measures shall be borne entirely by the CONTRACTOR.

PART 2 - PRODUCTS

2.1 CLEAN-UP & RESTORATION

- A. The materials shall meet the requirements specified in the MDOT 2012 Standard Specifications as designated, as specified herein, and as approved by the ENGINEER:
1. Seed shall be Cardno Basic Prairie seed mixture as shown on Sheet G-03 or an approved equal.
 2. Fertilizers shall be a Class A. The percentages by weight shall be 12- 12- 12, or as approved by the ENGINEER.
 3. Water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances.
 4. Mulch blankets shall be High Velocity Straw Mulch Blankets as specified in MDOT section 917.

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01550

TRAFFIC CONTROL

PART 1 - GENERAL

1.1 SUMMARY

- A. Traffic control along the Nichols Arboretum Trails shall be maintained in accordance with the City of Ann Arbor Public Services Department Standard Specifications except as specified in Sections 103.05, 810, 812, 919, and 920 of the Michigan Department of Transportation (MDOT), 2012 Standard Specifications for Construction, the 2011 Michigan Manual of Uniform Traffic Control Devices (MMUTCD) and as amended herein.
- B. The CONTRACTOR shall furnish, erect, maintain and, upon completion of the work, remove all traffic control devices and barricade lights within the project and around the perimeter of the project for the safety and protection of local pedestrian and vehicular traffic in Arboretum. This includes, but is not limited to, advance, regulatory, and warning signs; barricades and channeling devices and barricades at the ends of the project.

1.2 SUBMITTALS

- A. The CONTRACTOR shall provide the ENGINEER with a Maintenance of Traffic Plan for approval thirty (30) days prior to the closure of any lanes or streets.
- B. The CONTRACTOR shall submit all necessary Maintenance of Traffic Plans to the City of Ann Arbor. The CONTRACTOR shall be responsible for producing all required plans.

1.3 MEASUREMENT AND PAYMENT PROCEDURES

- A. 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.
- B. The completed work as measured for this item of work will be paid for at the Contract Unit Price for the "Minor Traffic Control" Pay Item.
- C. The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the City Standard Specifications and as modified by this Detailed Specification.

PART 2 - PRODUCTS

2.1 TEMPORARY TRAFFIC CONTROL MATERIALS

- A. The materials and equipment shall meet the requirements specified in the corresponding sections of the MDOT 2012 Standard Specifications for Construction and the 2011 Michigan Manual of Uniform Traffic Control Devices (MMUTCD).

- B. Lighted plastic drum barricades meeting current MDOT and MMUTCD specifications shall be used on this project as Type II Barricades.

PART 3 - EXECUTION

3.1 TRAFFIC CONTROL

- A. Plans are provided that detail signage that is required in Arboretum. Trenches in the project area are to be barricaded with temporary concrete barriers or portable water filled barrier per NCHRP 350, TL-2 or as approved by the ENGINEER.
- B. The CONTRACTOR shall provide all required Type II and Type III barricades, flashers, flashing arrows, flaggers, and all signing required to properly and safely maintain traffic flow through the construction area in accordance with the Michigan Manual of Uniform Traffic Control Devices. The CONTRACTOR shall provide as many signs and barricades as required by the ENGINEER to protect and maintain traffic through this area at all times. The CONTRACTOR shall add any additional devices required by the ENGINEER to provide a smooth flow of traffic.
- C. Driveways shall not be blocked for extended periods of time unless arrangements can be made with the affected property owner(s). When it becomes necessary to temporarily block driveways, the CONTRACTOR shall notify the affected property OWNERS in advance to coordinate the work and allow sufficient time for vehicles to vacate from properties. It may be necessary to allow for vehicles to temporarily park in the roadway at locations that do not interfere with the CONTRACTOR's work. During these periods the owners of the respective vehicles must be available to, with proper notice, move their vehicles if it becomes necessary to accommodate the work.
- D. The CONTRACTOR shall provide all dust control and other means to reduce dust during construction. The CONTRACTOR shall grade and maintain the area of the road being used as traveling surface for the through, as well as the local traffic. Grading of the road and application of dust control measures shall be made on a weekly basis at minimum, or as often as required by the ENGINEER.
- E. Mailboxes, signs and newspaper boxes that are in the way of the construction shall be removed and reset immediately in a temporary location approved by the ENGINEER. Mail and paper delivery shall not be interrupted during the construction. Upon completion of the construction, all mailboxes and newspaper boxes, including their supports, shall be repositioned in their permanent locations as approved by the ENGINEER.
- F. The work of maintaining and relocating existing warning, regulatory and/or guide signs; and of removing, salvaging and reinstalling existing signs and supports is included in the bid price for the contract pay item "Minor Traffic Control".
- G. In the event of the CONTRACTOR's failure to comply with these provisions, the OWNER may with or without notice, cause the same to be done; and will deduct the cost of such work from any money due or to become due the CONTRACTOR under this contract, but the performance of such work by the OWNER or at his insistence, shall serve in no way to release the CONTRACTOR from his general or particular liability for the safety of the Public or the work.

3.2 STREET SWEEPING

- A. All open streets upon which construction activities have occurred shall be broom cleaned at the end of each workday. These construction activities include, but are not limited to, deliveries, hauling, and equipment transport. Large pieces of debris shall be removed immediately.

END OF SECTION

SECTION 01770

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

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

1.2 SUBSTANTIAL COMPLETION

- A. Substantial completion shall be the date as certified by the ENGINEER when the construction of the Project, or a specified part thereof, is sufficiently completed, in accordance with the Contract Documents, so that the Project, or specified part, can be fully utilized for the purposes for which it was intended.
- B. Before requesting inspection for Certification of Substantial Completion, complete the following. List exceptions in the request.
 - 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the work claimed as substantially complete. Include supporting documents for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Price.
 - 2. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the work is not complete.
 - 3. Advise OWNER of pending insurance changeover requirements.
 - 4. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
 - 5. Obtain and submit releases enabling OWNER unrestricted use of the work and access to services and required certificates releasing bridge for use.
 - 6. Complete final cleanup requirements, including touch-up and otherwise repair and restore marred exposed finishes.
- C. Inspection Procedures: On receipt of a request for inspection, ENGINEER will either proceed with inspection or advise CONTRACTOR of unfilled requirements.
 - 1. ENGINEER will prepare the Certificate of Substantial Completion following inspection, or advise CONTRACTOR of construction that must be completed or corrected before the certificate will be issued.
 - 2. ENGINEER will repeat inspection when requested and assured that the work has been substantially completed.
 - 3. Results of completed inspection for the basis of requirements for final acceptance.

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

1.3 FINAL ACCEPTANCE

- A. Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
 1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 2. Submit an updated final statement, accounting for final additional changes to the Contract Price.
 3. Submit a copy of ENGINEER's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance. The list shall be endorsed and dated by the ENGINEER.
 4. Submit consent of surety to final payment.
 5. Submit a final liquidated damages settlement statement.
 6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 7. Submit record drawings, damage or settlement survey, property survey, and similar final record information.
- B. Re-inspection Procedure: ENGINEER will inspect the work upon receipt of notice that work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the ENGINEER.
 1. Upon completion of re-inspection, 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, re-inspection will be repeated.

1.4 REQUEST FOR FINAL PAYMENT

- A. Submit request for final payment in accordance with the Agreement and General Conditions.
- B. Request for final payment shall include:
 1. Documents required in the General Conditions, as may be modified by the Supplementary Conditions.
 2. Releases or Waivers of Lien Rights:
 - a. When submitting releases or waivers of Lien rights, provide release or waiver by CONTRACTOR and each Subcontractor and Supplier that provided CONTRACTOR with labor, material, or equipment.

- b. Provide list of Subcontractors and Suppliers for which release or waiver of Lien is required.
 - c. Each release or waiver of Lien shall be signed by an authorized representative of entity submitting release or waiver to CONTRACTOR, and shall include Subcontractor's or Supplier's corporate seal if applicable.
 - d. Release or waiver of Lien may be conditional upon receipt of final payment.
- 3. Consent of Surety.
 - 4. Documentation that all punch list items are complete.
 - 5. Warranties.
 - 6. Record Drawings being maintained by the CONTRACTOR.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 02001

SITE GENERAL PROVISIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The CONTRACTOR shall provide all labor, materials, tools and equipment necessary for the preparation and completion of the site of the project.

1.2 CLEARING AND GRUBBING

- A. The CONTRACTOR shall clear the work area of all wild brush and debris which may be present and interfering with construction and shall remove and dispose of the same. Removal of trees and brush under 3-inch diameter and trimming of overhead branches shall be incidental to the Contract work items.
- B. Trees and shrubs are not to be removed unless required by the Plans and/or with the express permission of the ENGINEER. Where trees are to be removed or are permitted to be removed by the ENGINEER, the CONTRACTOR shall remove such trees and stumps to a depth of at least one foot below the proposed finish grade. All stumps, roots, logs, branches, brush and debris shall be removed from the site and disposed of by the CONTRACTOR.
- C. Grubbing shall consist of removing from the ground and disposing of all stumps and roots more than three inches in diameter to a depth of one foot.

1.3 PROTECTION OF TREES

- A. All trees which are to be preserved and which, in the opinion of the ENGINEER, might be subject to damage by the CONTRACTOR's operations, shall be adequately protected against damage by placing tree protection fencing around the tree at a distance from the trunk in feet equal to the diameter of the tree in inches. Such protection shall not be removed until authorized by the ENGINEER.
- B. Machine excavation shall not be made within a circular area of any tree, the diameter of the area in feet being equal to the diameter of the tree in inches. If hand excavation within this area cuts across a large root of a tree, the cutting of which, in the opinion of the ENGINEER, would be injurious to the tree, the CONTRACTOR shall tunnel under such root and protect it from injury throughout the work.
- C. Trees which interfere with the work, and the removal of which is permitted, shall be removed by the CONTRACTOR at his expense and in a safe manner. No trees are to be removed without the expressed approval of the governmental body having jurisdiction thereof, and of the ENGINEER.

1.4 TEMPORARY ROADWAYS

- A. The CONTRACTOR may locate a temporary roadway along the lines of the permanent roadway, placing suitable subgrade and base materials, to meet the requirements of the permanent roadway.
- B. The location of any other temporary roadways and/or access drives shall be subject to the approval of the ENGINEER.

1.5 WORK AREA AND STORAGE OF MATERIALS

- A. The working area shall be organized in an orderly manner with storage and tool sheds, offices and sanitary facilities, parking areas for employees, and all other necessary facilities developed and maintained by the CONTRACTOR. The CONTRACTOR shall keep the site and all haul roads reasonably clean and dust free.
- B. All materials, supplies and equipment, whether furnished by the CONTRACTOR or by the OWNER, shall be delivered, stored and handled as to prevent the inclusion of foreign materials and/or damage by water, freezing, breakage or other causes. The ENGINEER may require the CONTRACTOR to provide an enclosed storage shed for the storage of the above mentioned materials, supplies and equipment. Packaged materials shall be delivered in the original unopened containers and shall be stored until ready for use. All materials which have been stored shall meet the requirements of the Specifications at the time they are used in the project.
- C. Where the CONTRACTOR is required to do work within the rights-of-way under the jurisdiction of governmental bodies, he shall meet the requirements of said governmental bodies for the work and storage within their jurisdiction. Such requirements must be met as a minimum requirement, and if the specifications given herein impose further limitations on the work, they shall also be met as the required work standard.

1.6 STAGING

- A. The CONTRACTOR shall make arrangements for equipment and material staging locations near to the project site. The location shall be outside of the Roadway Right-of-Way and public property. The CONTRACTOR shall get written permission from the property OWNER. Restoration of the staging area will not be paid for separately and will be at the CONTRACTORS expense.

1.7 EXISTING PUBLIC UTILITIES

- A. Existing public utilities and underground structures, such as pipe lines, electric conduits, sewers and water lines are shown on the Plans. The information shown is believed to be reasonably correct and complete; however, neither the correctness nor the completeness of such information is guaranteed.
- B. The CONTRACTOR shall conduct his operations so as not to damage any existing utility whether shown in the Plans or not. The CONTRACTOR shall correct, at his own expense, any injury caused during the operations of his subcontractors or suppliers.
- C. If the CONTRACTOR desires, or is required by the utility companies, to relocate or protect any power or telephone poles to facilitate his work, any expense encountered from such relocation shall be borne by the CONTRACTOR.

1.8 NOTIFICATION TO UTILITIES

- A. Prior to the start of any operations in the vicinity of any utilities, the CONTRACTOR shall notify the utility companies and request that they stake out the locations of the utilities in question.

1.9 SANITARY REQUIREMENTS

- A. The CONTRACTOR shall provide adequate sanitary facilities for all persons employed on the project. The sanitary facilities shall conform in every way to the requirements of the "General Safety Rules and Regulations for the Construction Industry".

1.10 UTILITIES

- A. The CONTRACTOR shall make all necessary arrangements for the provisions of all utility services, temporary or permanent, required under this Contract. The CONTRACTOR shall pay all costs for such connections and services.
- B. All utility services shall be inspected by and shall meet the requirements of the applicable codes and governmental bodies.

1.11 PUMPING AND DRAINAGE

- A. Adequate pumping and drainage facilities shall be provided and water, from whatever source, entering the work during any stage of construction shall be removed promptly and disposed of in a manner satisfactory to the ENGINEER. All pumping and drainage shall be done with no damage to property or structures and without interference with the right of the public, OWNERS of private property, pedestrians, vehicular traffic, or the work of other CONTRACTORS. Dewatering shall be done in such a manner that the soil under or adjacent to existing structures shall not be disturbed, removed or displaced.
- B. The overloading or obstructing of existing drainage facilities shall not be permitted, and the CONTRACTOR shall be solely responsible for any damages caused to such existing drainage facilities during his operations.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.1 CONTROL OF WATER POLLUTION AND SILTATION

- A. General Requirements
 - 1. The CONTRACTOR shall conduct his work in a manner to comply with Part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act, Act 451 of 1994 as detailed in the Standard Specifications and as shown on the plans. All work of water pollution and siltation control is subject to inspection by the City of Ann Arbor.
 - 2. All applicable regulations of fish and wildlife agencies and statutes relating to the prevention and abatement of pollution shall be complied with in the performance of the Contract.
 - 3. Construction operations shall be conducted in such manner as to reduce erosion to the practicable minimum and prevent damaging siltation to streams or lakes. The area of erodible land exposed to the elements by grading operations, including gravel pits, waste or disposal areas and haul roads, at any one time shall be subject

to approval of the ENGINEER and the duration of such exposure prior to final trimming and finishing of the areas shall be as short as practical. The ENGINEER shall have full authority to order the suspension of grading and other operations pending adequate and proper performance of trimming, finishing and maintenance work or to restrict the area of erodible land exposed to the elements.

4. Gravel or stone, consisting of durable particles of rock and containing only negligible quantities of fines, shall be used for construction pads, haul roads and temporary roads in or across streams.
5. The disturbance of lands and waters that are outside the limits of construction as staked is prohibited, except as found necessary and approved by the ENGINEER.
6. The CONTRACTOR shall conduct his work in such manner as to prevent the entry of fuels, oils, bituminous materials, chemicals, sewage or other harmful materials into streams, rivers, lakes or reservoirs.
7. Water from aggregate washing or other operations containing sediment shall be treated by filtration, by use of a settling basin or other means to reduce the sediment content to a level acceptable to the City of Ann Arbor.
8. All waterways shall be cleared as soon as practical of falsework, piling, debris or other obstructions placed during construction operations not a part of the finished work. Care shall be taken during construction and removal of such barriers to minimize the muddying of a stream.

B. Temporary Control Requirements

1. The CONTRACTOR shall provide temporary soil erosion and sedimental controls according to current local soil conservation district soil erosion and sedimentation control standards, working drawings and specifications or revisions thereof.
2. The CONTRACTOR shall not pump water directly from the excavation into the river but shall construct and maintain stilling basins to receive the pumpage with an overflow from the basins to the river. The basins shall be of sufficient size to allow proper settling of sediment before the water flows into the river. The CONTRACTOR shall remove and/or restore the basin area to original condition after backfilling is complete. Water from well points may be discharged directly into the river providing such operation does not result in erosion of river banks.
3. Permanent soil erosion control measures for all slopes, channels, ditches or any disturbed land area shall be completed within 15 calendar days after final grading or the final earth change has been completed or where significant earth change activity ceases, temporary soil erosion control measures shall be implemented within 30 calendar days. All temporary soil erosion control measures shall be maintained until permanent soil erosion control measures are implemented.

3.2 FINISH GRADING, TOPSOIL

- A. After all backfilling and rough grading has been completed and thoroughly compacted, the entire disturbed area at the site shall be graded to smooth, even surfaces as shown by the proposed new contours shown on the Plans. The portion of the disturbed area where no new contours are shown shall be graded to smooth, even surfaces approximating the original surfaces.

- B. All debris and larger stones and sticks and the like shall be removed and disposed of and the entire disturbed area made ready for the addition of topsoil and seeding.
- C. After all construction has been completed; the CONTRACTOR shall spread 3 inches of approved, clean, screened topsoil over all graded areas. The CONTRACTOR shall secure and deliver to the site whatever amount is required as part of the restoration pay item.

END OF SECTION

SECTION 02400

EARTHWORK

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The CONTRACTOR shall perform all excavation and backfilling necessary to complete the work. This shall include the excavation of earth and rock, the removal and disposal of unsuitable material, dewatering, placement of suitable fill and backfill material, pipe boring and jacking, and the restoration and final grading for all earth surfaces.

1.2 WORK WITHIN RIGHTS-OF-WAY

- A. Where the governmental bodies having jurisdiction of the streets or rights-of-way have specific specifications relating to the requirements for work within their jurisdiction, such requirements must be met as a minimum requirement, and if these Specifications impose further limitation on the work, they shall also be met as the required work standard.
- B. During all operations of the CONTRACTOR in the streets and roadways, the CONTRACTOR shall maintain barricades, lights, and warning signs as required by the agency having jurisdiction.

1.3 WORK WITHIN EASEMENTS

- A. During construction within any easements, the CONTRACTOR shall confine himself to the limits shown on the Plans. He shall notify property owners in advance of moving equipment on easements and use of the access routes which will be designated by the OWNER. The OWNER will cooperate in working out the details of access. The topsoil over the trench shall be removed and carefully replaced upon completion of the work. The backfill of the trench in the easement may be left slightly high to provide for any slight residual settlement. Any trees, shrubs, or bushes removed shall be replaced to the satisfaction of the Property Owner.

1.4 SOIL BORINGS

- A. Soil boring results, if taken on a site, are appended to these Specifications with locations noted. Boring logs are shown to be generally representative of the site and to assist in the design and construction of the work.

PART 2 - PRODUCTS

2.1 BACKFILL MATERIAL

- A. For areas not requiring "granular backfill" material, backfill shall be of the excavated material, with the exception that materials such as soft clay, topsoil, muck, cinders, vegetable matter, refuse, boulders and other objectionable and non-packing earth shall be excluded from the backfill and removed from the site. Stone larger than 3 inches in any dimension shall be excluded from the backfill and removed from the site by the CONTRACTOR.
- B. Where "granular material" backfill is required as specified herein, backfill material shall be defined as a material meeting granular material Class II as defined in 2003 MDOT 902.08.

PART 3 - EXECUTION

3.1 GENERAL EXCAVATION

- A. Excavation shall be performed by any practicable method consistent with the integrity and protection of the work and neighboring structures, workmen, and the public. Topsoil shall be separately removed and stockpiled for reuse.
- B. All excavation, except where necessary to tunnel, bore or jack under roads, railroads, tree roots and other obstructions within the limits indicated on the Plans, may be open cut from the surface. Tunneling or boring under trees shall be considered as incidental to construction and will not be considered as cause for request for additional payment.
- C. Foreign material or unsuitable foundation material encountered such as wood, boulders, etc., which obstruct the excavation, shall be removed. Such materials found at the bottom of the excavation shall be removed and the foundation restored with approved materials.
- D. If excess excavation is made or the material becomes disturbed so as to require removal beyond the prescribed limits, the resulting space shall be filled with selected material solidly tamped into place, in not more than 6-inch layers to the satisfaction of the ENGINEER, before the construction work proceeds. At the direction of the ENGINEER, the excess excavation may be filled with 2,000 psi concrete at the CONTRACTOR's expense.
- E. The excavation shall be kept dry during the work. Where water is encountered in the excavation, it shall be removed by pumping or well points. All necessary precautions shall be taken to prevent damage to existing wells and to completed or partially completed structures. The CONTRACTOR shall be responsible for all damages caused by him due to inadequate or improper protection.

3.2 EXCAVATION FOR SEWERS AND WATER MAINS

- A. Trenches shall be excavated to the depth required with allowance for bedding the pipe. The trench shall be cut wider and deeper at each pipe joint location to provide for properly completing the pipe joint and to relieve the joint of all loadings.
- B. The width of the trench at the top of a rigid pipe shall be sufficient to allow the pipe to be laid and jointed properly and shall provide for a minimum net clearance of 6 inches and a maximum net clearance of 12 inches on each side of the barrel of the pipe and to allow the backfill to be placed and properly compacted.
- C. The width of trench at the top of a flexible pipe backfill when using concrete bedding shall be sufficient to allow the pipe to be laid and jointed properly with the minimum net clearance of 12 inches and a maximum net clearance of 18 inches on each side of the barrel of the pipe.
- D. Where the conditions of the ground require, or where the work is in close proximity of existing structures, the sides of excavation shall be securely held by bracing and/or sheeting which may be removed in units when the level of the backfill has reached a point where it is safe to pull the sheeting without disturbing the protected feature. No sheeting, bracing, or other timber shall be left in the excavation upon the completion of the main or other structures, except with the specific review and direction of the ENGINEER.
- E. Other underground mains, sewers or structures encountered in the excavation shall be adequately supported during the CONTRACTOR's operations, and before backfilling, shall be given permanent support as directed by the ENGINEER to meet the standards or requirements of the owning utility or agency.

- F. Water, sewer, gas and other utility services disturbed by the CONTRACTOR in his operations shall be repaired or replaced in a manner equal to the original condition by the CONTRACTOR at his own expense. Where these services are encountered and are undamaged, they shall be supported and/or protected by the CONTRACTOR at his expense against later settlement and/or damage after backfill. The CONTRACTOR shall consult the agency or the utility firm having jurisdiction over any duct line, gas main, etc., which may cross the excavation to determine method of supporting such duct or pipe.
- G. All excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing sidewalks and driveways. Hydrants under pressure, valve manhole covers, valve boxes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the work is completed. Gutters shall be kept clean, or other satisfactory provisions made for street drainage, and natural water courses shall not be obstructed except as otherwise provided for herein on a temporary basis.

3.3 EXCAVATION FOR STRUCTURES

- A. Excavation for structures shall be extended sufficiently beyond the limits of the structure to provide ample room for form construction and for practicable construction methods to be followed.
- B. Requirements for excavation of sewers and water mains shall also apply to this Section.

3.4 EXCAVATION FOR PAVED SURFACES

- A. In excavating around manholes and catch basins or inlets, care shall be exercised to avoid removing the casings and pushing dirt into the structures. Dirt pushed into manholes, catch basins or inlets by the CONTRACTOR's operations shall be immediately removed so that the dirt will not be carried into the sewer by the flow of sewage or storm water.
- B. The CONTRACTOR shall take ample precautions to protect all trees and ornamental shrubbery not within the limits of the construction area, or within the construction areas shown on the Plans to be retained from injury by workmen, equipment, or any other agencies connected with the work, including subcontractors. Such protection shall be provided during the progress of the excavation, grading, or other phases of the work as necessary. Such trees or shrubbery shall be surrounded by protective posts or fencing before construction begins, when in the judgment of the ENGINEER, such precautionary measures are necessary. If, as a result of any phase of the work, trees are damaged or it is necessary to remove limbs in the way of construction, the repair of the damage and such limb removal shall be done by the CONTRACTOR as directed by the ENGINEER. All costs for the protective work shall be borne by the CONTRACTOR as incidental to the Contract work.

3.5 ROCK EXCAVATION

- A. Rock excavation shall consist of excavating igneous, metamorphic and sedimentary rock which cannot be excavated without continuous drilling and blasting or drilling and splitting to fracture the rock. Blasting shall be permitted only after it has been shown that other methods of excavation are impractical. All rock excavation shall be carried to a minimum depth of 8 inches below the pipe or manhole bottom and to the bottom of all footings. The width of the rock excavation shall not exceed the diameter of the pipe plus 12 inches on either side or the edge of the foundation footing.

- B. When the use of explosives is necessary for the progression of the work, the CONTRACTOR shall comply with all laws, ordinances and applicable safety code requirements and regulations relative to the handling, storage and use of explosives and protection of life and property. A person competent and experienced in the use of explosives shall be employed to supervise the work. The CONTRACTOR shall schedule all blasting for a definite hour of the day and shall so notify all residents and businesses in the area as to the scheduled day and hour for such blasting operations. Explosive materials shall not be stockpiled and stored in residential areas. Explosives and initiating devices shall not be carried in the same vehicle.
- C. Suitable weighted plank coverings or timber mats shall be provided to confine all materials lifted by blasting within the limits of the excavation of trench. Excessive blasting or overshooting shall not be permitted. Any material outside of the authorized excavation cross section which may be shattered or loosened shall be removed at the CONTRACTOR's expense. The CONTRACTOR shall be responsible for all damage resulting from the use of explosives.

3.6 SHORING, SHEETING AND BRACING

- A. Where sheet piling, shoring, sheeting, bracing, or other supports are necessary, they shall be furnished, placed, maintained, and except as shown or specified otherwise, removed by the CONTRACTOR.
- B. All sheet piling, shoring, sheeting and bracing shall be designed by a professional engineer engaged by the CONTRACTOR with demonstrated competence and experience in such work. The sheeting system shall be designed to prevent bottom failure and hydrostatic uplift within the excavation. Provision shall also be made in the design for lateral pressures due to side slope and construction equipment or other surcharge loads, as applicable.
- C. The CONTRACTOR shall provide to the ENGINEER for his review, design calculation and arrangement drawings of the sheeting system prior to ordering any materials for bracing, sheeting, etc., and prior to the commencement of the excavation.
- D. All materials, except as otherwise specified, used for sheeting and sheet piling, lagging, braces, shores, and stringers, or waling strips shall be of approved quality and dimensions throughout.
- E. Materials for sheeting systems shall be furnished and driven or set in place by the CONTRACTOR, where necessary or wherever ordered by the ENGINEER, whether the same is or is not considered necessary by the CONTRACTOR. If, in the opinion of the ENGINEER, the materials furnished by the CONTRACTOR are not of proper quality or sufficient size or not properly placed to ensure the safety of the work or of adjacent structures and property, the CONTRACTOR shall, upon notice from the ENGINEER to that effect, forthwith procure, furnish and set in place or drive other and satisfactory materials, or place the material in a satisfactory manner; and if he shall fail or neglect to do so, the ENGINEER may order all or any part of the work to be stopped until such materials so used are furnished and placed; and the CONTRACTOR shall not be entitled to claim, demand, or receive any compensation for larger size or better quality or different disposal of materials ordered by the ENGINEER, nor any compensation for allowance of any kind whatsoever for or on account of any damage or delay resulting from such stoppage of work.
- F. Steel sheet piling may be either new or used. It shall be of adequate strength, straight and properly braced. Steel sheet piling shall be of the interlocking type. Friction in the interlocks shall not be assumed to contribute to the strength of the sheet piling.

- G. The design, planning, installation and removal, if required, of all sheet piling, shoring, sheeting, and bracing shall be accomplished in such a manner as to maintain the required excavation or trench section and to maintain the undisturbed state of the soils below and adjacent to the excavation.
- H. Steel sheet piling for the excavation shall be driven straight and in-line. The piling shall be supported aboveground, before driving, by a guide frame at least 20 ft high which will keep the piling accurately in the required position and vertical. Each piece of piling shall be driven only a few feet at a time and driving shall proceed continuously around the perimeter so that the piles shall reach their full penetration together.
- I. Walers and bracing shall be supplied and installed as required to complete the sheeting system. Walers and braces shall be of adequate strength for the load imposed. Splices in walers shall develop the full strength of the member in bending, shear, and axial compression.
- J. If bracing members are to be removed during construction, the timing and procedure for removal shall not induce excessive stresses in the permanent structures or in steel sheet piling and bracing members.
- K. If the construction sequence of structures requires the transfer of bracing to the completed portions of any structure, the CONTRACTOR shall secure written acceptance of the ENGINEER prior to the installation of such bracing.
- L. In trenching operations the use of horizontal strutting below the barrel of pipe or the use of the pipe as support for trench racing will not be permitted. The use of a traveling shield for sewer construction shall require that the device be approved for use by a professional engineer. Sheet piling and timbers in trench excavations shall be withdrawn in a manner so as to prevent subsequent settlement of the pipe or additional backfill loadings which might overload the pipe.
- M. The neglect, failure, or refusal of the ENGINEER to order the use of sheeting, or sheet piling or steel, or to order the same to be left in place, or the giving or failure to give of any order or directions as to the manner or methods of driving or placing sheeting, sheet piling, bracing, shores, etc., shall not in any way relieve the CONTRACTOR of any or all obligations under this Contract. Sheeting left in place shall be cut off one (1) ft below existing grade.
- N. The rules of the OSHA and the State Department of Labor with respect to excavation and construction shall at all times be strictly observed.

3.7 BACKFILLING FOR SEWERS AND WATER MAINS

- A. Backfilling shall consist of placement of the prescribed materials from a level 12 inches above the crown of the pipe. Placement shall be as follows:
 - 1. Under gravel driveways, gravel roads and shoulders, the backfill shall be granular material which shall be solidly compacted by mechanical tamps in layers of not more than 12 inches loose thickness with backfilling carried up to within 12 inches of finished grade. Compaction of backfill shall be such as to obtain 95% of the maximum unit density as determined at the optimum moisture content.

2. Under pavements, curb, paved driveways, and sidewalks, the backfill shall be granular material compacted in layers not to exceed 12 inches loose thickness with backfilling carried up to subgrade. Compaction of backfill shall be such as to obtain 95% of the maximum unit density as determined at the optimum moisture content. After a period of about 60 days or less, if the backfill compaction is satisfactory to the ENGINEER, to provide for any slight settlement, the CONTRACTOR shall retrim neatly any broken edges of pavement and replace the top surface of the backfill within the pavement area with pavement surface equal to that surface which was removed. The pavement shall be replaced in accordance with the standard specifications of the agency having jurisdiction.
3. Backfill around lift stations, or buried underground structures shall be granular material compacted in 12-inch lifts. Compaction of backfill shall be such as to obtain 95% of the maximum unit density as determined at the optimum moisture content.
4. For all other areas, backfilling shall consist of placing excavated material as defined in Paragraph 2.01.A. of this Section, in 12-inch lifts to finish grade. Compaction of backfill shall be such as to obtain 90% of the maximum unit density as determined at the optimum moisture content.

3.8 FILLING AND BACKFILLING FOR STRUCTURES

- A. Embankments underlying structural footings, streets and drives, sidewalks and around structures shall be granular material meeting the requirements of the Michigan Department of Transportation for granular material compacted to 95% density.
- B. In all other areas, material required for embankments and backfilling shall be soil or soil-rock mixture free of organic and other deleterious matter and shall contain no more than 15% rocks or lumps larger than 2-1/2 inches in the greatest dimension, compacted to 90% density.
- C. Under all interior and exterior floor slabs, an 8-inch thick granular cushion shall be placed. This material shall be clean mineral aggregate meeting the following gradation requirements:

Passing the No. 4 Sieve	100%
Passing the No. 200 Sieve	0-3%
- D. Where embankment material is placed to achieve a new surface elevation, the top 4 inches shall be approved topsoil either salvaged from the site or hauled in by the CONTRACTOR.

3.9 FILLING AND BACKFILLING FOR PAVED SURFACES

- A. Embankments, including sand cushions and granular fills, shall be placed in successive layers not more than 6 inches in depth the full width of the cross section, each layer to be thoroughly compacted by means of vibratory compactors or by an approved pneumatic-tired roller or combination thereof, as required by the ENGINEER. Each layer shall be compacted to not less than 95% of the maximum unit density as determined at the optimum moisture content. All parts of the embankment shall be uniformly compacted and the CONTRACTOR shall so direct all earthmoving equipment used in the work so that the same shall be attained. Embankment or fill outside the limits of the subgrade where sand or gravel is not required shall be made with suitable material which is free from perishable organic matter, rubbish, stones, broken concrete, roots, or other foreign materials, at no additional compensation. Before any embankments are begin, the base shall be made firm and cleared of topsoil, sod or other perishable material. The sides of the embankment shall be neatly and evenly dressed to the slope shown on the Plans, or such other slope as the ENGINEER may direct.

- B. Upon completion of the placing of the curbs, and after the concrete has cured sufficiently, forms shall be removed and the excavated space behind the curb shall be backfilled with a good quality of surface soil, free of rubbish, stone, broken concrete, roots or other foreign material. Where adequate acceptable material for backfill behind the curb is not available, granular fill conforming to 2003 MDOT 902.08, Class II, shall be used. Where the area behind the curb is in cut, it shall be trimmed from the top of the curb on the slope shown on the Plans. If the area is in embankment or fill, an earth berm shall be placed immediately adjacent to the top of the curb and then the embankment of fill shall be finished to the slope shown on the Plans. All trimming and finishing shall be done in a neat, workmanlike manner. All excess concrete and debris shall be removed from the excavation behind the curb line before backfilling begins.
- C. In construction of non-rigid pavements, backfilling back of curb and gutter shall be completed before placement and compaction of the base course of the roadway.

3.10 GRADING

- A. The CONTRACTOR shall grade the site to achieve the elevations as shown on the Plans. All disturbed areas beyond the grading limits shall be restored to prior condition.
- B. Surplus excavated material not needed for embankment shall be disposed of by the CONTRACTOR. Headwalls, culverts, drains, sewers and appurtenances filled or damaged by the CONTRACTOR during the course of his operations shall be cleaned, repaired, or replaced at his expense.
- C. All temporary earth changes shall be in conformance with the Soil and Erosion Control Act.

3.11 RESTORATION

- A. Headwalls, culverts, and drainage systems filled or damaged by the CONTRACTOR during the course of his operations shall be cleaned, relaid or rebuilt with new materials to a condition equal to the original state, and of thickness equal to the original structure and to the original line and grade at the CONTRACTOR's expense.
- B. Where the excavation is located beside a ditch and/or where an existing ditch is filled or disturbed in the CONTRACTOR's operations, the CONTRACTOR shall clean, repair, or replace the ditch with properly pitched bottom and side slopes and of section and capacity not less than the original section.
- C. Where excavation has been through lawn areas, the CONTRACTOR shall restore the disturbed area by placing topsoil and seeding or sodding over the final backfill material.
- D. The CONTRACTOR shall remove excess dirt and other construction material from the site of the work and leave the site in a condition equal to its original state.
- E. The final condition of the streets and roadways shall be subject to the approval of the governmental body having jurisdiction thereof, as well as review by the ENGINEER.

END OF SECTION

SECTION 02446

WATER MAIN HORIZONTAL DIRECTIONAL DRILLING

PART 1 - GENERAL

1.1 SUMMARY

- A. The CONTRACTOR shall furnish all labor, materials and equipment required to construct water main by directional drilling method, and all necessary appurtenant work as herein specified.
- B. Directional drilling is a trenchless construction method. A high-pressure fluidjet steerable toolhead that uses a mixture of bentonite clay and water is launched and guided through the soil to create a pilot tunnel. Upon reaching the pit dug at the section location, the toolhead is removed and a reamer with the HDPE pipe attached is joined to the arm swing and pull back through the tunnel. A vacuum spoils extraction system removes any excess spoils generated during the installation.
- C. The work shall include, but not necessarily be limited to, the following: the installation of HDPE pipe and connections to existing and proposed water main structures.
- D. This work shall consist of using the directional drilling method of placing pipe for use as a water main. All work shall be completed in accordance with the Michigan Department of Environmental Quality (MDEQ) Permit for the Construction of Water Supply Systems, the project plans, as specified herein, and as directed by the ENGINEER.

1.2 SUBMITTALS

- A. The CONTRACTOR shall submit the following:
 - 1. CONTRACTOR's qualification information as described in Subsection 4-4 **1.3**.
 - 2. A list of field supervisory personnel and their experience with guided drilling operations. At least one of the field supervisors listed must be at site and be responsible for all work at all times when guided drilling operations are in progress. Guided drilling operations will not be allowed to proceed until the resume(s) of the CONTRACTOR's field supervisory personnel have been received and reviewed by the ENGINEER.
 - 3. Manufacturer's technical data, catalog data showing complete information on material composition, physical properties, and dimension of pipe and fittings. Also, the manufacturer's recommendation for handling, storage and repair of pipe and fittings if damaged.
 - 4. Written procedures to detail the proposed method of installation. This shall include, but not be limited to, size, capacity and setup requirements of equipment; location and sighting of drilling and receiving pits; method of dewatering; method of fusion and type of equipment for joining HDPE pipe; type of cutting tool head; entry and exit angles; method of monitoring and controlling line and grade; shoring and bracing; method of abandonment of pilot hole and adjacent utility investigations.

5. Material Safety Data Sheets (MSDS) for bentonite drilling mud products; product handling procedures; special precautions required; method of mixing and application and method of removing spoils material.
6. Sufficient material shall be submitted to show that materials and equipment proposed for use in the work are acceptable and complied with the Contract Specifications. All Drawings, catalog cuts and other descriptive data covering several related items in the same system shall be submitted at the same time in order that their complete integrated applicability in the entire system be adequately reviewed.
7. If the CONTRACTOR determines that modifications to the method and equipment as stated in the original submittal are necessary during construction, the CONTRACTOR shall submit a plan describing such modifications, including the reasons for the modification.
8. Fusion joint data and fusion technician data indicating conformance with this specification and applicable standards, including written documentation regarding any intended variances from this specification and applicable standards. This will include fusion joint warranty information and recommended project specific fusion parameters, including criteria logged and recorded by data logger.
9. The following product data and information is required from the CONTRACTOR:
 - a. Directional drilling equipment information and certification indicating the applicability of equipment commensurate with the size and scope of the project.
 - b. Directional drilling operator certification and references, project scope and CONTRACTOR's contact information for the experience commensurate with the size and scope of the project.
 - c. Shop Drawings include for each drilling installation any excavation locations, interfering utilities, excavation dimensions, bore dimensions and locations, project specific soil conditions, stress calculations and traffic control schematics. ENGINEER shall approve all Shop Drawings prior to construction.
 - d. A project safety and contingency plan which shall include, but shall not be limited to, drilling fluid containment and cleanup procedures, equipment and plan for compromised utility installations including electrical and power lines, water, wastewater and any other subsurface utility.
 - e. At least two weeks prior to the start of work, the CONTRACTOR shall submit his drilling schedule identifying daily work hours and working dates for each installation.
 - f. Information about the drilling fluid to be used, including product information, material specifications, and handling procedures; material safety data sheet and special precautions required; methods of mixing and application; and disposal plan.

10. As-recorded fusion report for each fusion joint performed on the project, including joints that were rejected. Submittals of the Fusion Technician's joint reports are required as requested by the OWNER or ENGINEER. Specific requirements of the Fusion Technician's joint report shall include:
 - a. Pipe Size and Dimensions
 - b. Machine Size
 - c. Fusion Technician Identification
 - d. Job Identification Number
 - e. Fusion Number
 - f. Fusion, Heating, and Drag Pressure Settings
 - g. Heat Plate Temperature
 - h. Time Stamp
 - i. Heating and Cool Down Time of Fusion
 - j. Ambient Temperature

11. As-recorded plan and profile data for the actual alignment of the installed pipeline.
 - a. The as-recorded plan will reflect horizontal offset from the baseline and depth of cover, a maximum of every 25 feet and at all changes in direction, whichever is less.
 - b. All fittings, valves, or other appurtenances will also be referenced and shown.
 - c. This document, along with tracking log sheets, should they be used, shall be provided to the OWNER and/or ENGINEER. Tracking log sheet data, should it be employed, shall include any and all that apply, including positions, roll angle, tilt angle, depth, and hydraulic pull back force measured.
 - d. As-recorded plans shall show any deviations from the original plans.

1.3 QUALITY ASSURANCE

- A. It is preferred that the directional drilling CONTRACTOR shall have actively engaged in the installation of pipeline using guided drilling for a minimum of three years with at least 10,000 feet of guided drilling installation in the last year to include 6" to 24" diameter projects similar in scope and value to this project and submit proof of projects and references. Information submittal shall include, but not be limited to, date and duration of work, location, pipe information (i.e. length, diameter, depth of installation, pipe material, etc.), project OWNER information (i.e. name, address, telephone number, contact person, etc.), and the contents handled by the pipeline (water, wastewater, conduit, gas, etc.).

- B. Directional drilling shall be performed by personnel fully trained in the use joint fusion methods recommended for HDPE pipe connections. Personnel directly involved with installing the HDPE pipe shall receive training in the proper installation methods. The directional drilling CONTRACTOR shall provide a certification of training for each new crew member.

1.4 SITE CONDITIONS

- A. Drilling operations must not interfere with, interrupt or endanger surface and activity upon the surface. The placement of directional drill equipment or supplies shall be a location that will not interfere with traffic or with the use of the adjacent property.
- B. When rock stratum, boulders, underground obstructions, or other soil conditions that impede the progress of drilling operations are encountered, the CONTRACTOR and ENGINEER shall review the situation and jointly determine the feasibility of continuing drilling operations, making adjustments or switching to an alternative construction method.

1.5 MEASUREMENT AND PAYMENT PROCEDURES

- A. The "12" Storm Sewer, DR 11 HPDE, Directional Drill" pay item will be paid by the horizontally measured lineal feet (LF) of water main installed by directional drilling method measured along the axis of the storm sewer. The unit price shall include complete furnishing of all labor, materials and equipment for the installation of storm sewer by directional drilling method, including obstruction removal, preliminary testing, excavations for launching and receiving pits, guided drilling equipment, pilot hole boring, insertion of carrier pipe, pipe fittings, drilling fluid, spoils disposal, adaptors, sand backfill and compaction for launching and receiving pits. This item shall also include connections, temporary bracing, temporary marker, plugging, dewatering, shoring and sheeting, spoils disposal, backfilling, compaction, clearing, grubbing, anchor blocks, submittals and other work incidental thereto.

PART 2 - PRODUCTS

2.1 POLYETHYLENE PIPE (HDPE) AND FITTINGS

- A. All materials shall meet the requirements as specified herein.
 - 1. High Density Polyethylene (HDPE) pipe shall meet the requirements of AWWA C906 and be approved for use with potable water under ANSI/NSF Standard 14. All pipes shall be manufactured from high density PE 4710 resin, having a dimension ratio (DR) of 11 or less and a minimum interior working water pressure 200 psi. The DR is calculated as the outside diameter of the pipe divided by the minimum wall thickness. The AWWA C906 and NSF identifications must appear on the exterior wall print line of any HDPE pipe proposed for potable use and installation.
 - 2. All HDPE pipe shall have a Ductile Iron Pipe Sized (DIPS) inside diameter (ID).
 - 3. The mechanical adaptor shall be as recommended by the manufacturer, meet the requirements of AWWA C906, be approved for use with HDPE pipe, and be approved by the ENGINEER.
 - 4. All fittings and mechanical joints shall meet the requirements of AWWA C906 and be approved for use with HDPE pipe and potable water under ANSI/NSF Standard 14.

5. Concrete used for thrust blocks (reaction blocking) or concrete encasement of the flex restraints shall be Grade S2 concrete meeting the requirements of the section 701 of the Michigan Department of Transportation 2012 (MOOT) Standard Specifications for Construction. Type MR, F, and/or G Admixtures shall not be used.
6. A drilling fluid of water and bentonite or a polymer must be used to lubricate and line the drilled hole.
7. Provide flowable fill in accordance with the City of Ann Arbor Standard Specifications for Construction.

PART 3 - EXECUTION

3.1 PIPE DELIVERY, STORAGE AND HANDLING

- A. Delivery, storage and handling of pipe shall be in accordance with manufacturer's recommendations.
- B. The pipe manufacturer shall package the pipe in a manner designed to deliver the pipe to the project site neatly, intact, and without physical damage. The transportation carrier shall insure the pipe is properly supported, stacked, and restrained during transport such that the pipe is not physically damaged.
- C. Pipe shall be stored on clean, level ground to prevent undue scratching or gouging. If the pipe must be stacked for storage, such stacking shall be done in accordance with the pipe manufacturer's recommendations. The pipe shall be handled in such a manner that it is not pulled over sharp objects or cut by chokers or lifting equipment.
- D. HDPE pipes with gashes, nicks, abrasions or any such physical damage which may have occurred during storage or handling which are wider or deeper than 10% of the pipe wall thickness shall not be used and must be cut out and removed from the construction site.
- E. Fused segments of pipe shall be handled so as to avoid damage to the pipe. Chains or cable type chokers must be avoided when lifting fused sections of pipe. Nylon slings are preferred. Spreader bars are recommended when lifting long fused sections.
- F. HDPE pipe shall be inspected for damage immediately prior to joining. Damage will consist of: (1) serious abrasion, cutting, or gouging of the outside surface extending to more than 10% of the wall thickness in depth, (2) kinking due to excessive or abrupt bending, (3) flattening, particularly if localized over short lengths of the pipe amounting to more than 5% of the original diameter, and (4) any abrasion or cutting of the inside surface. Damaged portions shall be cut out and discarded.

3.2 METHODS OF CONSTRUCTION

- A. A minimum of fourteen (14) calendar days prior to beginning actual drilling operations, the CONTRACTOR shall submit a Directional Drilling Plan for review and acceptance by the ENGINEER. The plan shall indicate entrance and exit locations, stationing, depth of cover, and curve data. The plan shall also describe the method to be used for handling drilling fluid and emergency procedures for containing fluids in cases of accidental discharge. Work shall not commence on any directional drilling activities until such time as the Directional Drilling Plan has been

accepted by the ENGINEER. Contract time shall continue during the review period of the Directional Drilling Plan.

- B. As the drilling proceeds the CONTRACTOR shall create an accurate as-built record of the alignment and elevation of the pipe with stationing.
- C. Prior to beginning drilling operations the CONTRACTOR shall prepare the entrance and exit locations and provide adequate supplies of drilling fluid, dewatering equipment, drill rods, and boring equipment to ensure a continuous operation when drilling begins.
- D. The CONTRACTOR shall be responsible for any sheeting and shoring, dewatering with well points where necessary, and determining types of subsurface materials, which may be found, and determining their effect on subsequent construction operations.
- E. The minimum depth of cover at any location shall be 4 feet and the maximum depth of cover at any location shall not exceed 15 feet. Depth of cover is measured from the finished grade to the top of the pipe.
- F. All HDPE pipe joints shall be fusion welded butt joints.
- G. The method of installation shall consist of drilling or jacking a steerable rod with equipment capable of continuous, accurate monitoring of the drill bit location. Upon reaching the exit point, the CONTRACTOR shall attach a cone or wing cutter to the rod which when pulled back will obtain the required diameter.
- H. The diameter of the cone or wing cutter shall not exceed the diameter of the HDPE pipe by more than one and one half (1) times. When the diameter of the cone or wing cutter is more than 2" larger than the pipe diameter, flowable fill shall be pumped into the void between the pipe and the drill hole to displace the drilling fluid. The method of placement of the flowable fill shall be approved prior to the issuance of the permit to place pipe.
- I. The HDPE pipe shall be connected to the rods per the manufacturer's specifications to be pulled back through the hole.
- J. Due to the fact that linear dimensions will vary with temperature change, connections to HDPE pipe shall not be made until it has reached an equilibrium temperature with its surrounding environment.
- K. Restrained connections to conventional ductile iron water main, valves, or appurtenances shall be made using a mechanical joint adaptor with a stainless steel stiffener inserted, unless otherwise shown on the plans. All mechanical joints shall be in accordance with AWWA/ANSI C111/A21.11 and include the Mega-Lug Joint Restraint System manufactured by EBAA Iron Sales, Inc. or the Ford Valve Box Company Uni-flex Retainer (UFR 1400-D-x style.)
- L. All HDPE pipe shall be properly aligned at all transitions to conventional ductile iron pipe. A detectable tracer wire (copperhead 12 AWG vs extra strength hand drawn 1150# wire with a blue jacket) adequate for future location efforts shall be installed the entire length of the pipeline and shall terminate in the gate wells located at each end of the water main installation, or as directed by the ENGINEER.

ORCHARD HILLS WATER MAIN EXTENSION

3.3 JOINING OF HIGH DENSITY POLYETHYLENE (HDPE) PIPE

- A. Sections of HDPE shall be assembled and joined by the butt fusion process into continuous lengths on the job site above the ground. The joining method shall be the heat fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations and ASTM Standard D2657 Practice for Heat-Joining of Polyolefin Pipe and Fittings. The heat fusion equipment used in the joining procedures shall be capable of meeting all conditions recommended by the pipe manufacturer. Hot fusion joining of HDPE end sections and fittings may be performed in the excavations.
- B. Where the polyethylene pipe is connected with fittings or valves, an HDPE mechanical joint adapter or flange adapter shall be fused to the end of the HDPE pipe and the connection made with restrained mechanical joint components or flange. Refer to the manufacturer's recommendations. Where the electrofusion flex restraint is specified, the required Flex Restraint Saddles shall be attached to the pipe by electrofusion or a thrust-isolator shall be heat-fused to the pipe.
- C. All joints shall be inspected by the ENGINEER before the pullback. The pipeline shall be joined on site in appropriate working lengths near the exit pit. In determining the maximum pulling length, the CONTRACTOR shall consider the physical condition at the job site and limitations of his equipment.
- D. Fusible pipe will be fused by qualified fusion technicians, as documented by the pipe supplier. Training records for qualified fusion technicians shall be available to OWNER or ENGINEER upon request.
- E. Each joint fusion shall be recorded and logged by an electronic monitoring device (data logger) affixed to the fusion machine. Joint data shall be submitted as part of the As-Recorded information, in accordance with this specification.
- F. The fusible pipe will be installed in a manner so as not to exceed the recommended bending radius.
- G. Where fusible pipe is installed by pulling in tension, the recommended Safe Pulling Force, according to the pipe supplier, will not be exceeded.
- H. Only appropriately sized, and outfitted fusion machines that have been approved by the pipe supplier shall be used for the fusion process. Fusion machines must incorporate the following properties, including the following elements:
 - 1. HEAT PLATE – Heat plates shall be in good condition with no deep gouges or scratches within the pipe circle being fused. Plates shall be clean and free of any contamination. Heater controls shall properly function, and cord and plug shall be in good condition. The appropriately sized heat plate shall be capable of maintaining a uniform and consistent heat profile and temperature for the size of pipe being fused, per the pipe supplier's recommendations.
 - 2. CARRIAGE – Carriage shall travel smoothly with no binding at less than 50 psi. Jaws shall be in good condition with proper inserts for the pipe size being fused. Insert pins shall be installed with no interference to carriage travel.
 - 3. GENERAL MACHINE – Overview of the machine body shall yield no obvious defects, missing parts, or potential safety issues during fusion.

4. DATA LOGGER – The current version of the pipe supplier’s recommended and compatible software shall be used. Protective case shall be utilized for the hand held wireless portion of the unit. Data logger operations and maintenance manual shall be with the unit at all times. If fusing for extended periods of time, an independent 110V power source shall be available to extend battery life.
- I. Other equipment specifically required for the fusion process shall include the following:
 1. Pipe rollers shall be used for support of pipe to either side of the machine.
 2. A weather protection canopy that allows full machine motion of the heat plate, fusion assembly and carriage shall be provided for fusion in inclement and/or windy weather.
 3. Fusion machine operations and maintenance manual shall be kept with the fusion machine at all times.
 4. Facing blades specifically designed for cutting HDPE pipe.
 - J. Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine. The fusion data logging and joint report shall be generated by software developed specifically for the fusion of HDPE pipe. The software shall include dimensional data and interfacial pressure relationships that are specific to HDPE pipe. Data not logged by the data logger shall be logged manually and be included in the fusion technician’s joint report.

3.4 EXCAVATION AND PITS

- A. Excavate required pits in accordance with CONTRACTOR’s proposed working Drawings.
- B. Dewatering of pits and excavations shall meet the requirements of the City of Ann Arbor Standard Specifications. When water is encountered, the CONTRACTOR shall provide a dewatering system of sufficient capacity to remove water, keeping any excavations free of water until the backfill operation is in progress.

3.5 GUIDED DRILLING

- A. Equipment
 1. The drilling equipment shall be capable of placing the HDPE pipeline within the proposed line and grade without inverted slopes.
 2. The drilling equipment shall have a minimum rating of pullback, torque and mud flow which is capable of installing the type of pipe of proposed diameter and length. Submit the drilling equipment data to the ENGINEER for review.
 3. The guidance system shall have the capability of measuring inclination, roll and azimuth. The guidance system shall have an independent means to ensure the accuracy of the installation. The CONTRACTOR shall demonstrate a viable method to eliminate accumulated error due to the inclinometer (pitch or accelerometer). The guidance system will be capable of generating a plot of the borehole survey for the purpose of an as-built Drawing. The CONTRACTOR shall also prepare to provide alternative methods such as gyroscoping, ground penetrating radar or “intelligent” pigs to determine the as-built position.

4. Equipment set-up requirements at the designated locations shall be determined by the CONTRACTOR and submitted to the ENGINEER per the requirements of Subsection 1.3.

B. Pilot Hole Boring

1. The entry angle of the pilot hole and the boring process shall maintain a curvature that does not exceed the allowable bending radius of HDPE pipe respectively.
2. Alignment Adjustments and Restarts
 - a. The CONTRACTOR shall follow the pipeline alignment as proposed on the Drawings. If adjustments are required, the CONTRACTOR shall notify the ENGINEER for approval prior to making the adjustments.
 - b. In the event of difficulties at any time during boring operations requiring the complete withdrawal from the tunnel, the CONTRACTOR shall be allowed to withdraw, abandon the tunnel and begin a second attempt at a location approved by the ENGINEER, or at the option of the CONTRACTOR and with the approval of the ENGINEER.
3. The number of access pits shall be kept to a minimum and the equipment must be capable of boring the proposed length in a single bore.

C. Installing Pipe

1. After the pilot hole is completed, the CONTRACTOR shall install a swivel to the reamer and commence pullback operations. Pre-reaming of the tunnel may be necessary and is at the option of the CONTRACTOR.
2. Reaming diameter shall not exceed 1.4 times the diameter of the pipe being installed. When the reamer exceeds allowable diameter, a flowable fill or suitable grout shall be pumped into the void between the HDPE pipe and drill pilot hole displacing the drilling fluid. The flowable fill or suitable grout material and method of placement shall be approved by the ENGINEER prior to installation of pipeline.
3. The HDPE pipe being pulled into the tunnel shall be protected and supported so that it moves freely and is not damaged by stones and debris on the ground during installation. Damaged portions of pipe shall be cut out and discarded.
4. Pullback forces shall not exceed the allowable pulling forces for the HDPE pipe.
5. The CONTRACTOR shall allow sufficient length of HDPE pipe to extend past the termination point to allow connections to adjacent pipe sections or structures. Stretching of about 1% of the total length pull will often be observed. Additionally, HDPE pipe length change due to temperature change may be observed. This can be as much as 1 in./100 ft./10°F difference in temperature between the pipe before and after installation. Pulled pipes shall be allowed 24 hours of stabilization prior to making tie-ins. The length of extra HDPE pipe will be at CONTRACTOR's discretion.

D. Drilling Fluid and Spoils Disposal

1. Bentonite clay drilling fluid must be used on all drilling. It is not acceptable to use just water as a drilling fluid. Bentonite clay mixture shall meet the manufacturer's requirements for the soil conditions encountered.
2. Disposal of excess drilling fluid and spoils shall be the responsibility of the CONTRACTOR who must comply with all relevant regulations, right-of-way, work space and permit agreements. Excess drilling fluid and spoils shall be disposed at an approved location. The Township will not provide a disposal site. The CONTRACTOR is responsible for transporting all excess drilling fluid and spoils to the disposal site and paying any disposal costs. Excess drilling fluid and spoils shall be transported in a manner that prevents accidental spillage onto roadways. Excess drilling fluid and spoils shall not be discharged into sanitary sewers or storm drain systems, or waterways.
3. Drilling fluid returns (caused by fracturing or formations) at locations other than the entry and exit points shall be minimized. The CONTRACTOR shall immediately clean up any drilling fluid that surface through fracturing.
4. The mobile spoils removal equipment capable of quickly removing spoils from entry or exit pits and areas with returns caused by fracturing shall be present during drilling operations to fulfill the requirements of paragraphs 1 and 2 above.

3.6 TESTING OF HDPE WATER MAIN PIPE

- A. Hydrostatic Pressure Testing. After completion of each run, the HDPE pipe shall be hydrostatically tested by the CONTRACTOR in the presence of the ENGINEER after it has reached equilibrium temperature with the surrounding environment and prior to connections with conventional ductile iron pipe. The CONTRACTOR may elect to test both the HDPE and the Ductile Iron Pipe simultaneously. However, the Ductile Iron Pipe shall then be required to meet the testing requirements of the HDPE.

Pressure testing shall comply with (AWWA), C906 and Plastic Pipe Institute (PPI) procedures as outlined below.

B. Hydrostatic Test Procedure:

1. Stabilize the pressure in the pipe by pumping pipe pressure to 160 psi and holding it at that pressure for a period of 4 hours in order to allow the pipe to thermally stabilize.
2. After 4 hours, reduce the pressure by 10 psi, to 150 psi.
3. After 1 hour, read the pressure gauge.
4. If the pressure drops more than 5% from 150 psi, the test will be deemed a failure.
5. If test fails, correct leakage problems and retest.

- C. Disinfection and Bacteriological Testing. All disinfection and bacteriological testing shall be completed in accordance with the requirements as described in the Special Provision entitled "Water Main and Appurtenances", sub-sections "Water Main Testing", "Flushing and Swabbing", "Chlorination", and "Bacteriological Testing ." No other testing procedures or methodologies will be allowed.

END OF SECTION

SECTION 02500

WATER MAIN AND APPURTENANCES

PART 1 – GENERAL

1.1 DESCRIPTION

- A. The CONTRACTOR shall furnish all labor, equipment, pipe, valves, fittings, restrained-joint pipe, restrained-joint gaskets, special gaskets as detailed on the plans and in the specification, polyethylene wrap, blow-off assemblies, fire hydrant, fire hydrant extensions, supplemental lighting towers, and all other materials necessary to complete the work as shown on the Plans, as detailed in this Detailed Specification, and as directed by the ENGINEER.
- B. All water main installation and testing procedures shall be performed in accordance with the project plans, the requirements of this Detailed Specification, and as directed by the ENGINEER.
- C. The work for all items shall include, but not be limited to; pavement saw-cutting; excavation and disposal of excavated material; connections to new and existing water mains; the furnishing and installation of solid sleeves and push-on-joint plugs where needed; the furnishing, installation, and removal of sheeting and/or shoring where needed; polyethylene wrap; the furnishing, placement and compaction of approved bedding and backfill materials; thrust blocks; additional labor and equipment costs associated with any required nighttime water main work; cleaning, disinfecting, flushing, bacteriological and hydrostatic testing; and any other required items to complete the work as shown on the plans, as detailed in this Detailed Specification, and as directed by the ENGINEER.
- D. The work of installing a gate valve-in-well shall include installation and backfill of the specified valve, furnishing and installing pre-cast concrete gate wells including the concrete base, straight pre-cast concrete sections, transition sections, and the adjustment of the structure cover. No separate payment will be made for adjusting the structure covers on new gate wells. The gate well cover shall be paid as "12-inch Gate Valve in Well". Upon completion of the work, the CONTRACTOR shall clean the Gate Well to the approval of the ENGINEER.
- E. The fire hydrant assembly work shall include the hydrant, the 6-inch gate valve-in-box, 3 feet of 6-inch pipe, the thrust block, and any required extensions to install the fire hydrant to the finish grade as shown on the plans.

1.2 MATERIALS

- A. Submittals. Prior to beginning construction, the CONTRACTOR shall submit the following:
 - 1. Product data on all ductile iron pipe, valves, fittings, pipe wrapping and hydrants.
 - 2. Manufacturer's certifications on all pipe, fittings, and precast concrete units indicating that all materials meet the minimum requirements of these specifications.

3. Information on equipment and methods to be used for flushing, chlorination, pressure and bacteriological testing.

B. General Specifications

1. Cast Ductile Iron Pipe and Fittings

- a. Cast ductile iron pipe shall be Iron Grade 60-42-10 and meet the requirements of ANSI/AWWA C151/A21.51 in all respects; with standard thickness cement mortar lining and asphaltic seal coat in accordance with ANSI/AWWA C104/A21.4; and, coated outside with an asphaltic coating in accordance with ANSI/AWWA C151/A21.51. 100% of the ferrous metals used in the manufacture of cast ductile iron pipe shall be recycled from scrap and other sources. All pipe shall be Pressure Class 350 (Table 50.5 ANSI/AWWA C150/A21.50), or Thickness Class 50 (Table 50.15, ANSI/AWWA C150/A21.50). Ductile iron pipe crossing under a railroad shall be thickness Class 56.
- b. Cast ductile iron river crossing pipe shall be Clow Corp. "F-141 River Crossing Pipe", U.S. Pipe "US IFLEX Saltless Flexible Joint Pipe" or equal approved by the ENGINEER, and shall be thickness Class 56 minimum. The pipe shall have a boltless flexible joint of the ball and socket type, and be designed for, and rated at, a minimum interior working water pressure of 250 psi.
- c. Restrained joint pipe, where called for on the Plans, shall be factory manufactured by the installation of retainer weldment and ductile iron locking segments or rings. Restrained joint pipe shall be TR-Flex restrained joint pipe manufactured by U.S. Pipe, Lok-Ring joint pipe manufactured by American Ductile Iron Pipe, or equal as approved by the ENGINEER.
- d. Cast ductile iron fittings shall be push-on joint, unless otherwise specified (with the exception of solid sleeves and fire hydrants which shall be mechanical joint), meeting the requirements of ANSI/AWWA C110/A21.10 for short body cast iron fittings. Fittings shall have a cement mortar lining and asphaltic seal coat in accordance with ANSI/AWWA C104/A21.4 and ANSI/AWWA C110/A21.10. The outside of all fittings shall have an asphaltic coating in accordance with ANSI/AWWA C110/A21.10.
- e. Solid sleeves shall be long-pattern sleeves.

2. Gate Valves and Gate Valve Boxes

- a. All gate valves shall be resilient seated meeting the requirements of AWWA C509. All valves shall be of the push-on joint type, unless used on tapping sleeve assemblies, or noted otherwise on the plans. The valves supplied shall be:

- (1) Metroseal 250 Resilient Seated Gate Valve as manufactured by U.S. Pipe & Foundry Company
 - (2) U.S. Pipe and Foundry Tyton Joint, Resilient Wedge Seated Gate Valve, meeting the requirements of AWWA C 509, AWWA C550, and ASTM D 2794
 - (3) American Flow Control, Series 2500, Single Resilient Wedge
 - (4) East Jordan Iron Works FlowMaster Resilient Wedge Valve
 - (5) Mueller Series, 4" through 12", A-2360-38, Resilient Wedge - SL x SL
 - (6) Tyler Series DRS 250-22 Double Resilient Wedge
- b. All valves shall come equipped with a two-inch square operating nut, opening right.
- c. Valve Boxes shall be Tyler 6860 Buffalo type, Size D, screw-type, 3 piece 5-1/4 inch shaft and a No. 6 Base for a valve 8-inches or less and a No. 8 base for 10- and 12-inch valves.
3. Gate Valve Wells
- a. Pre-cast reinforced concrete bases, bottom sections, manhole risers, grade adjustment rings, concentric cones, eccentric cones, and flat-slab tops shall conform to the requirements of ASTM C-478. Joints on precast gate wells shall meet the requirements of ASTM C-443, rubber O-ring gasket.
- b. Flat-slab top, pre-cast, gate wells shall be designed to accommodate HL-93 Modified Live Load requirements as determined by a Professional ENGINEER licensed by the State of Michigan, regardless of where they are to be installed. For the purposes of design, a HL-93 Modified Live Load shall consist of 1.2 times the design truck or 1.2 times a single 60 kip load, whichever produces the greater stresses.
4. Fire Hydrants
- a. Fire hydrants shall be East Jordan Iron Works Model 5-BR Water Master BR 250 with traffic flange. All fire hydrants shall have the following features: a 6-inch mechanical joint pipe connection, ANSI/AWWA C111/A21.11; two 2-1/2-inch National Standard hose connections; one 4-inch Stortz pumper connection; 1-3/8-inch pentagon operating and cap nuts (1-3/8-in. point-to-flat at top; 1-7/16-in. point-to-flat at base); open left; breakable flange construction; no barrel drain; and a painted red finish. Depth of bury (bottom of pipe to ground surface) is generally 6 feet but may vary depending on specific site conditions. The Stortz pumper connection must be 21 in. ± 3 in. above finish grade, and the breakable traffic flange must be between finished grade and 8 in. above finished grade.

- b. Fire hydrant extensions shall be fully compatible with the manufacturer of the fire hydrant assembly provided and be approved by the ENGINEER. East Jordan Iron Works hydrants shall be provided with a model 5-BR extension kit; and, Waterous Fire Hydrants shall be provided with a F1-K562-6 extension kit.
- c. All fire hydrants must be certified by Underwriters Laboratory (UL) or the National Sanitation Foundation (NSF) for use in a potable water system.

5. Tapping Sleeves and Valves

- a. Tapping sleeves and valves shall be manufactured of cast iron or stainless steel and designed for water service with a minimum working pressure of 150 psi. The sleeve shall be a full-bodied split sleeve design manufactured by one of the following manufacturers:
 - (1) Clow No. F-5205;
 - (2) Mueller Co. No. H-615;
 - (3) Waterous Series 800;
 - (4) East Jordan Iron Works MJ Tapping Sleeve with East Jordan FlowMaster RW Valve;
 - (5) Tyler/Union D.I. MJ Tapping Sleeve;
 - (6) Ford Meter Box Company Style FTSS;
 - (7) Power Seal Model No. 3490 AS;
 - (8) Smith Blair Model No. 622;
 - (9) JCM 432 All Stainless Steel Tapping Sleeve; and
 - (10) Price Brothers Company Tapping Sleeve for Prestressed Concrete Steel Cylinder Pipe (only to be used on concrete water mains).
- b. Tapping Sleeves for Pre-stressed Concrete Steel Cylinder Pipe shall be in accordance with AWWA M-9. The sleeves shall have a separate gland which permits installation of the sleeve prior to cutting of the prestress wires. The gland shall have a fusion epoxy coated (per AWWA C-213) waterway, and a broad gasket set in a retaining groove of a pressure plate gusseted to eliminate flexing. The gland shall be equipped with load bearing set screws to protect the cylinder. Grout under saddle is needed whether saddle is epoxy coated or not. Sleeves shall be furnished with grouting seals and grout horns to facilitate filling the space between the sleeve and the pipe. Tapping sleeves shall be a Price Brothers Company Tapping Sleeve for Prestressed Concrete Steel Cylinder Pipe or approved equal.
- c. Tapping valves shall be double-disk type of the same manufacture as the sleeve, NRS with two-inch square operating nut-opening right, and with a mechanical joint outlet.
- d. All tapping sleeves and valves must be certified by Underwriters Laboratory (UL) or the National Sanitation Foundation (NSF) for use in a potable water system.

6. Joints

- a. Push-on joints shall be single gasket joint meeting the requirements of ANSI/AWWA C 111/A21.11.
- b. Mechanical joints for fire hydrants and solid sleeves shall be in accordance with ANSI/AWWA C111/A21.11 and shall be the Mega Lug Series 1100 joint restraint system manufactured by EBAA Iron Sales, Inc. or the Ford Meter Box Co. Uni-flange Retainer (UFR 1400-D-x style).
- c. Bolts for mechanical joints shall be high strength, low alloy steel bolts, only, meeting the requirements of ANSI/AWWA C 111/A21.11. All bolts, nuts, and washers if required, shall be coated with a factory-applied fluoropolymer coating meeting the following requirements:
 - (1) Use Temperature: - 100°F to 500°F
 - (2) Salt Spray - ASTM B117 up to 4000 hours (nuts must not become frozen)
 - (3) Pencil Hardness - 5H to 6H - ASTM D3363-92A
 - (4) Kinetic Coefficient of Friction - 0.06 to 0.08
 - (5) Thickness - nominal 0.001" (1 mil)
 - (6) Impact - 160 in-lbs as measured by ASTM D2794-93
 - (7) Adhesion - 58 - ASTM D3359-95
 - (8) Di-electric Strength - 500V per mil
 - (9) Elongation – 35% to 50%
 - (10) Tensile Strength - 4,000 psi
 - (11) Operating Pressure - up to 100,000 psi
 - (12) Kesternich Test - Nuts not frozen up to 30+ cycles (DIN 50018)
 - (13) Corrosion Resistance: as measured by;
ASTM D 1308 Muriatic Acid, 31% HCL, 24 hours, No Effect
Sulfuric Acid, 93% H₂SO₄, 24 hours, No Effect
Caustic Soda, 100% NaOH, 24 hours, No Effect
Methy Ethyl Keytone, MEK, 24 hours, No Effect
ASTM B117 Salt Fog, 1,000 hours, No Effect
- d. The fluoropolymer coating shall strongly adhere to surface being coated and shall not flake off or be easily removed by rubbing or brushing.
- e. Cast ductile iron river crossing pipe joints shall be a push-on type ball and socket joint utilizing a first grade rubber gasket. The joint shall be capable of 15-degree full turning deflection without separation, leakage, or restriction of the pipe waterway. Joint restraint shall be provided by a boltless means which is locked against accidental disengagement of the restraining component. Pipe shall be furnished with the necessary gaskets, lubricant, and retainer locking accessories.
- f. Joints for restrained joint pipe shall be in accordance with ANSI/AWWA C111/A21.11. Bolts and nuts for the retainer assembly shall be stainless steel.

- g. Restrained, push-on joint, pipe shall be American Pipe's "Fast-Grip" gasket system, U.S. Pipe's "Field-Lok 350" gasket system, or Griffin Pipe "Field Lok 350" gasket system.
- h. The use of retainer glands and set screws shall not be acceptable.
- i. Lubricants used in making up joints shall be supplied by the pipe manufacturer and the joints shall be coupled in accordance with the manufacturer's requirements.

7. Pipe Wrapping

- a. All Cast Ductile Iron Pipe, Fittings, and Valves (except river, railroad and highway crossing pipe) shall be fully wrapped with polyethylene per ANSI/AWWA C105/A21.5 and the details as contained on the plans.

8. Water Main Pipe Marking

- a. The following information shall be clearly marked and/or cast on each length of pipe:

- (1) The pipe designation and class (e.g., D.I., Class 50).
- (2) The name or trademark of the manufacturer.
- (3) Country where cast.
- (4) The year in which the pipe was produced.
- (5) Identification of the manufacturing plant.

- a. The following shall be distinctly cast on each fitting:

- (1) The pressure rating of the fitting.
- (2) Nominal diameters of openings.
- (3) The name or trademark of the manufacturer.
- (4) Country where cast.
- (5) The number of degrees or fraction of the circle on all bends.
- (6) Ductile iron fittings shall have the letters "DI" or "Ductile" cast on them.

C. Manufacturer's Certification

- 1. All pipe furnished shall be accompanied by the manufacturer's certificate of test showing conformity with the Specifications. Each certificate shall identify a specific lot number, quantity of pipe, and show actual test results for the lot furnished. These certificates shall be submitted to the Inspector at the time of unloading.
- 2. All materials that will potentially be in contact with the City of Ann Arbor water supply must be certified by Underwriters Laboratory (UL) or the National Sanitation Foundation (NSF) for use in a potable water system. These materials shall include pipe coatings, pipe metals, cement linings, and joint lubricants and gaskets.

D. Inspection

1. All pipe furnished shall be subject to inspection on arrival at the job site by the ENGINEER. The purpose of the inspection shall be to cull and reject pipe or fittings that, independent of physical tests specified under the standard specifications designated herein, fail to conform to the requirements of these Specifications.
2. The CONTRACTOR shall notify the ENGINEER sufficiently in advance so that an Inspector may be on the job during the unloading of materials. A minimum notice of 24 hours is required for such unloading and inspection. The CONTRACTOR shall also notify the ENGINEER when the material has arrived at the site.
3. All ductile iron water main pipe shall be stacked on pallets off of the existing grade, with each end plugged or bagged so as to keep the pipe interior clean until final installation.
4. Cast ductile iron pipe and fittings shall be subject to rejection on account of any of the following:
 - a. Variation in any dimension exceeding the permissible variations given in the material specifications.
 - b. Any crack or defect in the cement mortar lining which, in the opinion of the ENGINEER, is non-repairable, including, but not limited to, loose or "hollow" lining.
 - c. Any signs of physical damage or poor manufacturing which might render the material unsuitable for its intended use.
 - d. Variation of more than 1/16-inch per lineal foot in alignment of pipe intended to be straight.
 - e. Damaged ends, where in the judgment of the ENGINEER such damage would prevent making a satisfactory joint.
 - f. Improper handling during delivery, unloading, or installation.

Rejected pipe shall be plainly marked by the Inspector and immediately removed from the site of the work by the CONTRACTOR, without cost to the City.

E. Water Main Bedding and Backfill Materials

1. The pipe bedding and trench backfill material requirements shall be in accordance with the detailed specifications, or the details shown on the plans.

1.2 CONSTRUCTION

- A. Water Main Installation, Bacteriologic and Hydrostatic Testing, and Acceptance Requirements shall be as described below. Installation of proposed water mains will require work in close proximity to existing utilities. This must be taken into consideration when the CONTRACTOR determines the required trench safety requirements. All excavation shall conform to all relevant MIOSHA Standards; the CONTRACTOR is solely responsible for determining all excavation and trench safety requirements.

1. Dry Tap

- a. When a connection to an existing water main is to be made in the dry, the existing main to which a connection is to be made shall be isolated by the closing of the necessary existing valves, and the water from the existing main shall then be pumped out or removed by other means so that the connection may be made in the dry. All pipe materials and appurtenances which will come into contact with potable City water after the restoration of water service following the connections shall be disinfected with a strong chlorine solution prior to installation.
- b. The CONTRACTOR may not operate City water main valves. For valve operation, contact City of Ann Arbor Public Services Area personnel; the City of Ann Arbor personnel will direct the operation of all valves by CONTRACTOR personnel. It is recommended that the CONTRACTOR request that the existing valves, which will need to be operated in order to perform the water main work, are checked in advance of the work to ensure that they operate properly. If the CONTRACTOR elects not to request the operation of the valves in advance of any required water main operation, then a request for extension of contract time will not be allowed.
- c. It is possible that the valves which need to be operated to facilitate a shutdown will not close entirely, thereby allowing water to leak past the valve into the area of the shut-down. The CONTRACTOR shall provide the necessary labor, material, and equipment to enable work to be completed with a poor shut down. Under no circumstances shall the CONTRACTOR be compensated for "downtime" associated with water main valve or appurtenance failure or its inability to properly operate or close fully. An extension of contract time may be allowed, if the CONTRACTOR has requested that the water main valves have been exercised in advance of the intended water main shutdown.
- d. Due to the size and length of pipe being shut down, and the quality of shut-down attained, large amounts of water may need to be removed from the excavation. Where possible, the water shall be run directly into nearby storm sewer inlets via pumps and hose.
- e. The CONTRACTOR shall have all pipe, fittings and appurtenances required to complete the water main connection prior to the excavation for the connection, or the work will not be allowed to commence.

- f. The CONTRACTOR shall complete the water main work in a manner which minimizes the disruption of water service to the greatest extent possible.
- g. The City must notify all businesses 48 hours in advance of a water main shut-down; residences must be notified 24 hours in advance. To give the City an opportunity to provide such notification, the CONTRACTOR shall schedule the water main shut-downs at least 72 hours in advance, and preferably a full four or five days in advance, of the water main shut-down.
- h. No water main shutdown shall take place after 12:00 p.m. (noon), unless written permission has been granted by the ENGINEER and that the CONTRACTOR has sufficient lighting equipment to provide a safe and efficient work area for working after dark. No water main will be shut down until the main has been exposed and cleaned, and is ready to be cut.
- i. There shall be no gap larger than 1/4 inch left in the existing water main as a result of the tie-in. If needed, a closure piece ("thrust ring") of such size so as to meet this requirement shall be installed.

2. Wet Tap

- a. Prior to the installation of a tapping sleeve, the section of pipe to be tapped shall be cleaned of all foreign material and wire brushed to a smooth surface. The two halves of the sleeve shall be placed around the pipe with the gaskets installed per the manufacturer's instructions. The bolts shall be tightened evenly from the center toward the ends. The bolts shall be tightened to the manufacturer's specified torque.
- b. When performing a wet tap in a prestressed concrete steel cylinder water main, grout is to be placed under the tapping saddle whether or not the saddle is epoxy coated.
- c. All pipe materials and appurtenances which may come into contact with potable City water shall be disinfected with a strong chlorine solution prior to installation. This includes the pipe section to be tapped, the two halves of the sleeve, gaskets and the gate valve.
- d. Prior to installation of the end gaskets, the sleeve shall be blocked with cement bricks such that the outlet is in proper position. The end gaskets shall be installed with an overlap as specified by the manufacturer.
- e. The glands shall be assembled on the pipe. The bolts around the gland shall be tightened evenly, causing the gaskets to uniformly compress.
- f. The valve shall be installed on the sleeve following the manufacturer's instructions.
- g. Prior to tapping, the assembly shall be tested using the test plug tap in the sleeve with the valve closed, or by placing a tapped plug on the

ORCHARD HILLS WATER MAIN EXTENSION

outlet of the valve with the valve open. The assembly shall be pressurized to 150 psi and hold the pressure fifteen minutes.

h. After the pressure test is complete, the pipe shall be tapped.

3. Oversized Water Mains

a. Portions of the proposed water mains or fittings may connect with existing water mains or fittings. The possibility exists that some of the existing water mains may have been constructed using oversized, cast iron pipe. Where tie-ins or interconnections are specified and the existing main is found to be oversized, the CONTRACTOR shall furnish and install Clow 3501B Sleeves, Tyler Dual Sleeve 5-146L, or Rockwell 441 Sleeves. These sleeves are to be present on the jobsite prior to the excavation for the water main connection, or the work will not be allowed to commence.

4. Permissible Deflection at Joints

b. Wherever it is necessary to deflect ductile iron pipe from a straight line, either in the vertical or horizontal plane, to avoid obstructions, to plumb valve stems, or where long-radius curves are permitted, the amount of deflection allowed shall not exceed that required for satisfactory making of the joint, and shall be approved by the ENGINEER. The deflection shall not exceed the following amounts:

Size of Pipe (Inches)	Joint Angle (Degrees)	Deflection in 18 ft. (Inches)	Approx. Radius of Curve Produced by Succession of 18 ft. Lengths (Feet)
4	5	19	205
6	5	19	205
8	5	19	205
10	5	19	205
12	5	19	205
16	3	11	340
20	3	11	340
24	3	11	340

The above joint deflection angles apply to fittings as well as pipe joints.

5. Trench Opening

a. The width of the trench shall be ample to permit the pipe to be laid and jointed properly, and the backfill to be placed and compacted as specified. Trenches shall be of such extra width, when required, to permit the convenient placing of timber supports, sheeting and bracing, and handling of special fittings. For each size of pipe, the minimum trench width shall provide clearance of four inches on each side of the bell of the pipe or fitting or six inches on each side of the pipe barrel, whichever is greater. The maximum trench width shall be in keeping with good construction practice, such that existing structures are not undermined.

- b. In excavating for water mains, the excavation shall at all times be finished to the required grade in advance of the pipe line, but unless otherwise permitted in writing by the ENGINEER, not more than 50 feet of trench shall be open at one time in advance of the pipe. At no time shall more than 200 feet of trench be opened and incompletely backfilled. At the end of each day, no more than 25 feet of trench may be left open, and access to all drives shall be restored. This opening shall be surrounded by fencing and barricades, or plated. The remainder of the trenching operation shall be available for safe vehicular and pedestrian traffic at all times.
- c. The trench shall be so braced and drained that the workers may work therein safely and efficiently. It is essential that the discharge of the trench de-watering pumps be conducted to natural drainage channels, drains, or storm sewers. If trench water is pumped to natural drainage channels or drains, approved soil erosion and sedimentation controls shall be installed and maintained at the point of discharge. If trench water is pumped into storm sewers, filters shall be provided to prevent the flow of rocks, mud and other debris into the storm sewer line.
- d. The length of street which may be occupied by the construction work at any one time shall be subject to the approval of the ENGINEER and will be based on the requirements of use of the street by the public.
- e. The CONTRACTOR shall fully comply with all laws and regulations governing construction methods and the furnishing and use of all safeguards, safety devices, protective equipment, and pollution controls. Particular care shall be taken to conform to all applicable rules of the Michigan Department of Labor, Construction Safety Standards Commission, "Safety Standards". Part 9 of the above document should be particularly noted.
- f. Where required to support the surfaces of adjacent throughfares, structures, or excavations, or to protect the construction work, adjacent work, or workmen; sheeting, bracing, and shoring shall be provided. The placing of such supports shall not release the CONTRACTOR of the responsibility for the sufficiency and integrity of the trench opening. In the removing of sheeting and bracing after the construction has been completed, special care shall be taken to prevent any caving of the sides of the excavation and injury to the completed work or to adjacent property.
- g. Sheeting, bracing, and shoring shall not be left in place after completion of the work except as required by the ENGINEER. Where the ENGINEER requires the sheeting, bracing, or shoring to be left in place it shall be cut off below the established surface grade as required by the ENGINEER.

6. Laying Pipe

- a. Each pipe shall be inspected for defects prior to being lowered into the trench. Inside of pipe and outside of spigot shall be cleaned of any earth or foreign matter.
- b. Proper implements, tools, and facilities satisfactory to the ENGINEER shall be provided and used by the CONTRACTOR for the safe and convenient prosecution of the work. All pipe, fittings, valves, and hydrants shall be carefully lowered into the trench piece by piece by means of an excavator using chains, slings, or other suitable tools or equipment as recommended by the manufacturer, in such a manner as to prevent damage to them and their protective coatings and linings. Under no circumstances shall materials be dropped or dumped into the trench.
- c. New water main construction shall not be connected into the existing system until it has been tested and accepted by the ENGINEER. Pipe shall be laid on the prepared trench bottom with the bell ends facing the direction of laying, unless otherwise directed by the ENGINEER.
- d. The CONTRACTOR shall take every precaution to prevent foreign material from entering the pipe while it is being placed in the line. During laying operations, no debris, tools, clothing or other materials shall be placed in the pipe. At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug. This provision shall apply during the noon hours as well as overnight. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry.
- e. Pipe shall be jointed as specified elsewhere herein. The pipe shall be secured in place with approved backfill material tamped under it except at the bells. Pipe and fittings which do not allow a sufficient and uniform space for joints shall be removed and replaced with pipe and fittings of proper dimensions to insure such uniform space. Precautions shall be taken to prevent dirt from entering the joint space.
- f. All pipe shall be laid at the correct line and grade as indicated by the grade stakes and offset line. Each pipe, as laid, shall be checked by the CONTRACTOR to insure that this result is obtained. The staking shall be provided by the ENGINEER. No pipe shall be laid until a cut sheet for that pipe has been approved by the ENGINEER. The grade as shown on the Plans is that of the top-of-pipe for water main; and the work must conform to this profile. For water main construction, a variation from the profile grade of two inches with ductile iron pipe, and three inches with reinforced concrete pipe, will be deemed sufficient reason to cause the work to be rejected and re-laid. Water main pipe alignment shall be maintained so as not to vary more than three inches from the correct line. Any pipe found out of line shall be re-laid properly by the CONTRACTOR.

- g. Due to conditions in the field, changes to the proposed vertical and horizontal alignment of the proposed water main may become necessary. The CONTRACTOR shall, where directed by the ENGINEER, excavate up to 60 feet in advance of the pipe laying operation to expose existing underground facilities thereby enabling the ENGINEER to make alignment decisions. The CONTRACTOR is required to realign (re-lay) the water main up to 2 feet vertically and/or horizontally as directed by the ENGINEER at no extra cost to the project. The excavation in advance of the pipe laying is intended to help eliminate the need for re-laying pipe.

7. Crossing Existing Structures and Facilities

- a. During the construction it may be necessary to cross under or over certain sewers, drains, culverts, water lines, gas lines, electric lines, fiber optic communication, telecommunication, and other types of underground structures or facilities, known or unknown. The CONTRACTOR shall make every effort to prevent damage to such underground structures and facilities. The CONTRACTOR shall not intentionally damage or break existing structures or facilities and repair them in order to expedite the water main installation process. Wherever such structures or facilities may inadvertently be disturbed or broken, they shall be restored to a condition that is equal to, or better than, that was encountered prior to the damage. All damaged structures and/or facilities shall be made fully acceptable to the OWNER and the City, at the CONTRACTOR's expense. All crossings shall be made with a minimum of twelve inches of vertical clearance between or alongside existing structures or facilities.

8. Cutting Pipe

- a. Cutting cast iron or ductile iron pipe for inserting valves, fittings, or closure pieces shall be performed in a neat and workmanlike manner without damage to the pipe or cement lining and so as to leave a smooth end at right angles to the longitudinal axis. Where the type of pipe joint in use is such that it employs push-on assembly to effect the joint seal, the outside of the cut end shall be tapered back 1/8 inch with a coarse file or a portable grinder at an angle of about 30 degrees. The tapering must remove all sharp and/or rough edges which might injure the gasket.
- b. The flame cutting of pipe will not be allowed. Reinforced concrete water main pipe shall not be cut.

9. Setting Water Main Fittings and Accessories

- a. Valves, fittings, plugs, hydrants, etc. shall be set and joined to pipe in the manner specified in the Section entitled "Making Joints."
- b. Hydrants shall be located as shown on the Plans or as directed by the ENGINEER in such a manner as to provide complete accessibility and minimize the possibility of damage from vehicles or injury to pedestrians.

10. Making Joints :

- a. Mechanical means shall be used for pulling home all rubber-gasket pipes regardless of trench condition where manual means will not result in pushing and holding the pipe home. When a trench box or liner is used, a cable shall be used to pull the joints home and hold them in position.
- b. Where work is performed in wet trenches or trenches with running sand, the CONTRACTOR shall provide and use mechanical means for pulling the pipe home in making up the joint and for holding the pipe joints tight until completion of the line. Mechanical means shall consist of a cable placed inside or outside of the pipe with a suitable winch, jack, or come-along for pulling the pipe home and holding the pipe in position.
- c. Where not required by these Specifications, manual means will be acceptable only if the joints can be pushed home and held.
- d. Hydrants shall be set to stand plumb with their nozzles parallel to the street and the pumper nozzle facing the street. Hydrants shall be set with pumper nozzles between 18- and 24-inches above finished grade, or as directed in writing by the ENGINEER.

11. Anchorage for Water Main Fittings and Accessories

- a. All plugs, caps, tees, hydrants, and bends shall be provided with MOOT Grade S2 concrete meeting the requirements of Section 701 of the 2012 MDOT Standard Specifications for Construction reaction backing (thrust block) as shown on the Plans or specified herein. Valves shall be restrained from movement at adjacent sleeves by the use of a closure piece, or thrust ring (full size pipe section cut to fill the gap inside the sleeve to within ¼-inch) as specified herein.
- b. Reaction backing shall be placed between unexcavated solid ground and the fitting to be anchored. The area of bearing on the pipe and on the ground in each instance shall be that shown on the details or directed by the ENGINEER. The reaction backing shall, unless otherwise shown or directed, be so placed that the pipe and fitting joints will be accessible for repairs. This shall include adequate protection of any bolts from direct contact with the concrete.
- c. Metal harnesses of tie rods or clamps may not be used instead of concrete reaction backing. Mega-Lug joint restraint systems and restrained, push-on joint, pipe shall be used where connections to existing lines require immediate pressurization, as specified herein.
- d. In the event that the ENGINEER determines a change in the anchorage or design is required due to unsuitable earth conditions, changes may be ordered by the ENGINEER.
- e. The use of friction clamps or set-screw type retainer glands for thrust restraint will not be allowed.

12. Abandonment or Removal of Water Main

- a. The CONTRACTOR shall abandon or remove water main(s) where shown on the Plans. All work shall be performed in accordance with the Detailed Specification entitled "Water Main and Appurtenances, Remove or Abandon".

13. Water Main Testing

- a. The water main shall be disinfected and tested by the CONTRACTOR in the presence of the ENGINEER in accordance with the requirements below. The CONTRACTOR shall furnish all piping, pumps, hoses, gauges, and other materials and equipment required to carry out the tests using water from the City's water mains. All chlorinated water shall be discharged directly to the sanitary sewer and will not be allowed to be discharged to the ground or any surrounding water course. Any hoses which are needed to direct water from blow-offs and/or hydrants during water main testing and flushing shall be supplied by the CONTRACTOR. The City shall furnish and install one inch corporation stops at all necessary locations, at the expense of the CONTRACTOR. The tapping of water mains, the installation of all corporation stops, and the operation of valves and hydrants is reserved for City personnel. The CONTRACTOR is required to assist in valve and hydrant operation, however. The CONTRACTOR shall give the City forty- eight hours prior written notice of intent and desire to test water mains.

14. Bacteriological Testing Sequences

- a. In the case of all water mains connected to existing facilities, flushing, chlorination and bacteriological testing must precede pressure testing. Where mains can be totally isolated from existing facilities with air gaps or double valves, pressure testing may precede chlorination and bacteriological testing. The normal sequence and time requirements for testing are:

Isolated (Gapped) Water Main	Connected Water Main
1. Fill Main	1. Flush and Swab*
2. Pressure Test	2. Chlorinate
3. Connect One End of Main	3. Wait; 24 hours
4. Flush and Swab*	4. Flush**
5. Chlorinate	5. Wait; 24 hours
6. Wait; 24 hours	6. Bacteriological Samples
7. Flush**	7. Wait; 24 hours
8. Wait; 24 hours	8. Bacteriological Samples
9. Bacteriological Samples	9. Wait; 48 hours
10. Wait; 24 hours	10. Pressure Test (If both sets of Bacteriological samples pass)
11. Bacteriological Samples	11. Flush
12. Wait; 48 hours	12. Wait; 24 hours
13. Make Final Connection(s) - Place in Service (If both sets of bacteriological	13. Bacteriological Samples
	14. Wait; 24 hours
	15. Bacteriological Samples
	16. Wait; 48 hours
	17. Place in Service (If both sets of bacteriological samples pass)

*Collect flush water in operable storm water retention/detention facility.

**Discharge flush water into approved sanitary sewer.

- b. The CONTRACTOR shall not connect any end of a newly constructed water main to an existing, in-service, water main, until the newly constructed water main passes the hydrostatic test, unless approved in writing by the ENGINEER.

15. Hydrostatic (Pressure Test)

- a. Insofar as is practical, mains shall be pressure tested between valves. The maximum length of water main to be tested in any one test shall be 1500 feet. The section of main to be tested shall be slowly filled with potable water and the entrained air within the pipe removed or absorbed and pumped up to a pressure of 150 psi (or other pressure if specified) and the test period shall start immediately thereafter. The lines shall then be maintained under a test pressure of 145-155 psi for a continuous period of three hours by pumping chlorinated (25 ppm) water into the line at frequent intervals. The volume of water so added shall be measured and considered to represent the leakage from the line under test during the interval. Visible leaks shall be repaired regardless of test results. The leakage under the conditions of the test shall not exceed the values shown in the table below. If one side of a double disc gate valve is under test pressure, that seat shall count as four joints.

Maximum Allowable Leakage per 100 Joints at 150 psi Avg. Test Pressure										
Pipe Diameter (Inches)	4	6	8	10	12	16	20	24	30	36
Leakage (gallons/hr)	0.66	0.99	1.32	1.66	1.99	2.65	3.30	3.97	4.97	5.96

- b. In the event that the leakage exceeds the maximum allowable leakage as specified above, the joints in the line shall be carefully inspected for leaks and repaired where necessary. Any pipes or fittings found to be leaking shall be removed and replaced with new pieces by the CONTRACTOR. After this work has been performed, all tests shall be repeated.

16. Flushing and Swabbing

- a. The CONTRACTOR shall flush the water main after making a connection to the existing City water main where a valve separates the new water main from the existing main. As a result, flushing will be accomplished using flow through the full size of the new water main. If a storm water retention/detention facility is to be constructed as part of the project, this facility is to be completed, stabilized, operable, and utilized for the collection of the flushing water. All pipe, materials, and appurtenances which will come into contact with potable City water after the restoration of water service following the connection shall be disinfected with a strong chlorine solution prior to installation.
- b. Water main shall be cleaned using a high density poly-pig, Girard Aqua Swab (2 lbs/ft³ density) swab, or ENGINEER approved equal and flushed. The diameter of the blow-off pipes shall be at least 50% of the diameter of the pipe being flushed. Hydrants, with internal components removed, may serve as blow-offs for mains 12-inches and less. The CONTRACTOR shall provide details, for the review and approval of the ENGINEER, for the various required blow-offs. Blow-off pipes, discharge hoses, where needed, and associated costs shall be included in the cost of the permanent water main being installed and will not be paid for separately. If there are no branch connections to be swabbed, the poly-pig shall be inserted in the new water main at the time of connection described above. The poly-pig shall be located on the "downstream" or new side of the separation valve. The poly-pig shall then be forced through the new water main during the first flush and discharged through a construction blow-off of sufficient size to allow passage of the poly-pig. For water mains with branch connections, a launching tee or wye shall be installed as shown in the details, for launching multiple poly-pigs. The main line and each branch main shall be flushed and swabbed individually. Following the successful final bacteriological testing of the water main, the launching tee/wye shall be permanently capped at its branch.

- c. During the flushing and swabbing of a water main, the discharge point for the main shall be left open, with all other discharge points closed, to direct the poly-pig completely through the main being swabbed to its point of termination. Following the initial swabbing of water main, the separation valve shall be closed, and then the discharge point closed. If a branch water main is to be swabbed, the poly-pig is then to be placed in the launcher; the discharge point for the branch water main is to be opened; the poly-pig is to be inserted into the water main; the separation valve partially opened and the branch water main flushed and swabbed.
- d. Following the swabbing of the water main(s), the water main(s) are to be flushed as required. If approved or directed by the ENGINEER, the water main(s) may be flushed overnight, provided that proper controls (i.e. hoses directed into storm structures, etc.) are installed to direct and control the flushing water.

17. Chlorination

- a. After the water mains to be tested have been acceptably flushed, they shall be disinfected in accordance with AWWA C651 "Disinfecting Water Mains" and these Specifications. All new mains and fittings, and any existing mains contaminated by the CONTRACTOR, shall be chlorinated to a minimum residual of fifty (50) parts per million (ppm) with commercial liquid chlorine solution (sodium hypochlorite - pool type). Other forms of chlorination and disinfection methods of water mains may be presented by the CONTRACTOR and shall receive prior approval in writing by the ENGINEER before being used. The minimum recommended dosage of sodium hypochlorite is as follows (based on 10% available chlorine):

Recommended Minimum Chlorine Dosage to Disinfect 100 L.F. of Pipe

Pipe Diameter (inches)	10% Chlorine Solution (gallon)
6	0.153
8	0.272
10	0.426
12	0.613
16	1.090
20	1.703
24	2.452

- b. The chlorinated water shall remain in the mains for a minimum of 24 hours, at the end of which period the chlorinated water at all parts of the main must show free available chlorine residual of at least twenty-five (25) ppm. If less than 25 ppm residual is shown at the end of the first 24 hour period, additional chlorine shall be added until a residual of not less than 25 ppm at all parts of the system is shown after a subsequent 24 hour period. The chlorinated water shall then be removed from the mains and disposed of into an existing, approved City sanitary sewer main, or other location approved in writing by the ENGINEER. All chlorinated water shall be discharged directly to the sanitary sewer and will not be allowed to be discharged

to the ground or any surrounding water course. The mains shall then be left full of water ready for bacteriological testing.

18. Bacteriological Testing

- a. The City will obtain bacteriological samples of the water in the mains for analysis from testing blow-offs, corporations, or other sampling points as determined acceptable by the City. Samples will be taken after the mains have been satisfactorily chlorinated in accordance with these Specifications, the chlorinated water flushed out and removed, and the mains filled with potable water. If the newly constructed water main is connected at one end to an in-service section of the City water main, and the chlorination precedes pressure testing, the City will also take samples after satisfactory pressure testing. In each case, two sets of samples shall be taken; a period of 24 hours must elapse between flushing of the main and drawing of the first samples, with the second samples being drawn 24 hours after the first samples were drawn. For each sample, a minimum of 48 hours is required to obtain test results. All samples must pass the bacteriological test.
- b. The CONTRACTOR shall plan for these testing sequences and durations in his construction schedule. Contract time will continue during all water main testing phases, regardless of duration.

19. Miscellaneous Construction Considerations

- a. The CONTRACTOR shall be responsible for coordination with the City of Ann Arbor Field Operations Unit for the installation of 1-inch corporations in the gate wells to be used for water main testing and/or filling of new main.
- b. The CONTRACTOR must have all materials, fittings, pumps and other miscellaneous equipment, and personnel on-site before the City of Ann Arbor Public Services personnel will prepare and shutdown and existing main.
- c. Pipe bedding and trench backfill material requirements shall be in accordance with the detailed specifications, or the details shown on the plans. Construct water main pipe bedding using granular material Class II, placed in layers no greater than 10-inches thick. Compact each layer to at least 95 percent of maximum unit weight for the entire length of the pipe. Where rock or hardpan is encountered, excavate the trench to at least 6-inches below the proposed bottom of the pipe; backfill with granular material Class II, and compact.
- d. Where unstable soil conditions, or obstructions other than rock, require excavation of the trench below the elevation detailed on the plans; undercut, backfill, and compact the trench as directed by the ENGINEER. Use 6A, 17A, or 34R aggregate as backfill material for undercutting due to unstable soil conditions. This work will be paid for as trench undercut and backfill according to subsection 402.04.E of the Michigan Department of Transportation 2012 Standard Specifications for Construction.

- e. The CONTRACTOR shall backfill water mains within the limits of the roadbed with granular material Class II. Place backfill in layers no greater than 10-inches thick and compact each layer to at least 95 percent of the maximum unit weight. Backfill water main outside the limits of the roadbed with ENGINEER approved granular or suitable material, compacted to 90% of the maximum unit weight, in lifts of 12-inches or less, unless otherwise noted on the plans.
- f. The CONTRACTOR shall excavate and expose all utility crossings prior to laying any water main pipe. This will allow the ENGINEER to adjust the grade of the water main, if possible, to avoid the existing utilities. The costs of this work, and all related costs, shall be included in the respective pay items associated with this Detailed Specification.
- g. Should the water main, or other pay items associated with this Detailed Specification, conflict with abandoned sewers or water mains, the conflicting section of the abandoned sewer or water main shall be removed and the remaining sections shall be (re)abandoned in accordance the Detailed Specification for "Water Main and Appurtenances, Abandon" and the Detailed Specification for "Sewer, Any Size or Depth, Abandon," except that flow filling the sewer will not be required. All the work shall be included in the cost of the water main, or other pay items in this Detailed Specification.
- h. All water main construction shall be completed in accordance with the Detailed Specification entitled "Maintaining Traffic" and as detailed on the plans. The CONTRACTOR shall schedule and coordinate all water main shutdowns with the ENGINEER. The CONTRACTOR shall submit for the ENGINEER's review and approval the sequence of all water main "shut downs" and tie-ins such that disruption in service to existing properties is minimized to the greatest extent possible. Should the ENGINEER not accept the CONTRACTOR's proposed construction sequence, it shall not be a basis of claim for extension of contract time or additional compensation.
- i. All water main and appurtenances shall be pressure tested, cleaned, disinfected and bacteriological tested in accordance with the specifications outlined within this Detailed Specification.
- j. Upon acceptance of each section of new main the CONTRACTOR shall begin coordination with the City of Ann Arbor Public Services Area for the installation of water services, curb stops and boxes in accordance with the Detailed Specification for "Water Service Tap and Lead, Excavate and Backfill."

END OF SECTION

SECTION 02700

PAVEMENT AND WALKS

PART 1 - GENERAL

1.1 SUMMARY

- A. All HMA pavement, concrete pavement, curb and gutter, and sidewalks shall be installed in accordance with the City of Ann Arbor Public Services Department Standard Specifications except as amended herein.
- B. The trail through Nichols Arboretum that is located within the project area is to be restored with a minimum of 6-inches of MDOT 23A aggregate.

1.2 MEASUREMENT AND PAYMENT PROCEDURES

- A. All HMA paving items shall be by the ton, in place. Unused portions of material loads shall be returned to the plant and re-weighed, and the corrected weight slip shall be provided to the ENGINEER. All weight slips must include the type of mixture (codes are not acceptable), as well as vehicle number, gross weight, tare weight and net weight. The unit prices for these items of work shall include all labor, material, and equipment costs to perform all the work specified in the City Standard Specifications and as modified by this Detailed Specification.
- B. All costs for furnishing and operating vacuum-type street cleaning equipment, backhoes, jackhammers, and air compressors shall be included in the bid prices for these items of work or in the item of work "General Conditions."
- C. Measurement of these HMA paving items shall be by the ton, in place. Unused portions of material loads shall be returned to the plant and re-weighed, and the corrected weight slip shall be provided to the ENGINEER. All weight slips must include the type of mixture (codes are not acceptable), as well as vehicle number, gross weight, tare weight and net weight.

PART 2 - PRODUCTS

2.1 SUBBASE

- A. Subbase shall meet the requirements of MDOT Section 902, Class II material.

2.2 AGGREGATE BASE COURSE

- A. Aggregate shall meet the requirements of MDOT Section 902, 23A aggregate.

2.3 PRIME AND BOND COATS

- A. Prime and bond coats shall meet the requirements of MDOT Section 904.

2.4 CONCRETE CURB AND GUTTER

- A. Concrete curb and gutter shall meet the requirements of MDOT Section 802. Concrete shall be Grade P1 unless otherwise indicated on the plans for Grade HE.

PART 3 - EXECUTION

3.1 HMA PAVEMENT REMOVAL

- A. This work shall consist of removing HMA surface/base as described in the City of Ann Arbor Standard Specifications, except as modified herein, and as directed by the ENGINEER.
- B. In areas where HMA pavement removal is to be performed adjacent to existing HMA pavement that is to remain, the pavement shall be sawcut prior to removal. Backhoe teeth, jackhammers equipped with spike points, milling machines, and backhoe mounted wheel cutters shall not be used. Damage to adjacent pavement, pavement base, subbase, curb, gutter, sidewalk, utility structures, or other site features, due to removal operations shall be repaired by the CONTRACTOR, at the CONTRACTOR's expense, as directed by the ENGINEER.
- C. The CONTRACTOR shall remove pavement and pavement base to a minimum depth of 12-inches below existing grade. Removal of all material located within the 12-inch minimum thickness is included in this item of work. Any additional aggregate or clay base removed without written approval of the ENGINEER shall be replaced by the CONTRACTOR at the CONTRACTOR's expense with 21AA Aggregate compacted-in-place, or with HMA asphalt, as directed by the ENGINEER.
- D. The areas to be removed shall be marked and measured prior to the removal of any material. Measurement shall take place with both the ENGINEER and the CONTRACTOR (or their agents) present. Both parties shall come to an agreement regarding removal quantities prior to the actual removal of HMA pavement.

3.2 HMA PAVEMENT

- A. All concrete work shall be completed prior to placing HMA mixtures.
- B. The CONTRACTOR shall have a 10-foot long straight-edge, backhoe, air-compressor and jackhammer available during all paving operations.
- C. MDOT SS-1h bond coat shall be applied at a uniform rate of 0.05 gallons/square yard, on all exposed, existing HMA and concrete surfaces which will come in contact with the new HMA material. The CONTRACTOR shall take extra care to avoid covering surfaces which are not to be paved. After September 15, SS-1h bond coat shall not be diluted by more than 25%.
- D. The CONTRACTOR shall place HMA wedges using the leveling and wearing mixtures specified herein, as directed by the ENGINEER, prior to placing the wearing course. Such wedging shall be measured and paid for at the respective unit price of the appropriate HMA Pavement item.
- E. Construction of butt joints, where directed by the ENGINEER, shall be measured and paid for as "Remove HMA Pavement".
- F. The CONTRACTOR shall schedule the paving operation to avoid longitudinal cold joints.
- G. HMA wearing and leveling courses shall be placed in lifts of 2-inches or less; base courses shall be placed in lifts of 3-inches or less.

- H. All specified HMA thickness dimensions are compacted-in-place.
- I. The CONTRACTOR shall construct the pavement courses to provide the final cross-slopes (crowns) specified by the ENGINEER.
- J. The CONTRACTOR shall construct feather joints, and shall feather the leveling and wearing courses at structures, in drive approaches, and at intersection joints, as directed by the ENGINEER. Feather joints shall vary the thickness of the asphalt from 0.0-inches to the required full paving thickness (approximately 1½-inches) over a 5-foot to 15-foot distance, or as directed by the ENGINEER. The CONTRACTOR shall rake all large aggregates out of the HMA mixture in feather joints, prior to compaction.
- K. The CONTRACTOR shall provide a minimum of two rakers during the placement of all wearing and leveling courses. Further, the CONTRACTOR shall provide, when directed by the ENGINEER, a second "Break-Down" roller in order to achieve the specified asphalt densities.
- L. The CONTRACTOR shall provide a minimum of 24-hours' notice to the ENGINEER prior to paving, and shall obtain a "Permit to Pave" from the ENGINEER in advance of scheduling paving.
- M. The CONTRACTOR and ENGINEER shall carefully observe the paving operation for signs of faulty mixtures. Points of weakness in the surface shall be removed or corrected by the CONTRACTOR, at his/her expense, prior to paving subsequent lifts of HMA material. Such corrective action may include the removal and replacement of thin or contaminated sections of pavement, including sections that are weak or unstable. Once the CONTRACTOR or his representative is notified by the ENGINEER that the material being placed is out of allowable tolerances, or there is a problem with the paving operation, the CONTRACTOR shall stop the paving operation at once, and shall not be permitted to continue placing HMA material until again authorized by the ENGINEER.
- N. During the placement of leveling and wearing courses, the speed of the paving machine(s) shall not exceed 50-feet per minute.
- O. The CONTRACTOR shall furnish and operate enough materials and equipment so as to keep the paving machine(s) moving continuously at all times. Failure to do so shall be cause for the suspension of the paving operation until the CONTRACTOR can demonstrate to the satisfaction of the ENGINEER, that sufficient resources have been dedicated to perform the work in accordance with the specifications.
- P. The CONTRACTOR shall use an asphalt paver or spreader box to place HMA mixtures. The CONTRACTOR shall not use a grader, front-end loader or any similar device to place HMA mixtures. For small areas, where approved by the ENGINEER, the CONTRACTOR may place the material by hand directly into patch areas. The CONTRACTOR shall not place HMA materials on adjacent pavement surfaces.
- Q. Each layer of HMA mixture shall be compacted to between 92 to 96 percent (or as determined acceptable by the ENGINEER) of the theoretical maximum density, as listed on the approved Job Mix Formula.
- R. Corrective action shall be enforced as described at Division 5 of the 2012 MDOT Standard Specifications and will be based on the City's testing reports.

3.3 CONCRETE CURB AND GUTTER

- A. This work shall consist of constructing concrete curb and gutter in accordance with Sections 601, 602, and 802 of the 2012 edition of the MDOT except as specified herein, as shown on the Plans, as shown in this Detailed Specification, and as directed by the ENGINEER.

3.4 PRIME COAT

- A. Prime coat shall be applied on a prepared aggregate base at a rate of 0.25 gallons per square yard.

3.5 BOND COAT

- A. Bond coat shall be applied to an asphalt base course at a rate of 0.10 gallons per square yard.

END OF SECTION

APPENDIX



CTI and Associates, Inc
28001 Cabot Drive Ste. 250
Novi, MI 48377

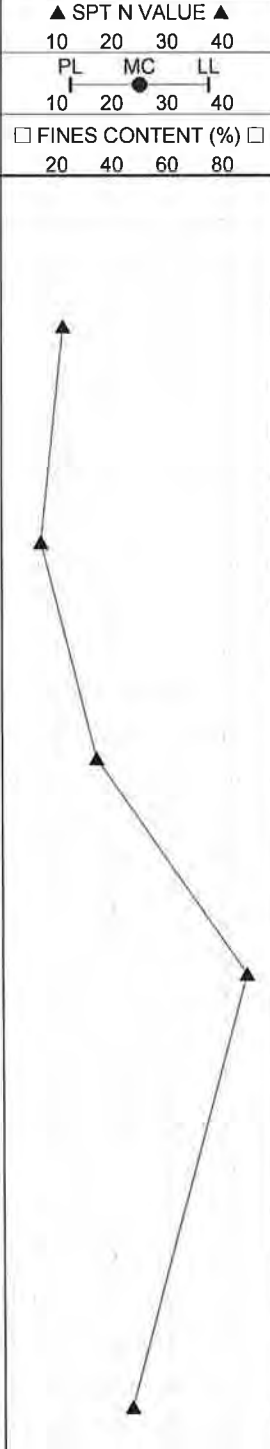
BORING NUMBER: B-1

PAGE 1 OF 1

CLIENT Stantec PROJECT NAME Nichols Arboretum Water Main
 PROJECT NUMBER 3162040011 PROJECT LOCATION Ann Arbor, MI
 DATE STARTED 5/3/16 COMPLETED 5/3/16 GROUND ELEVATION +/-
 DRILLING CONTRACTOR Brax Drilling GROUND WATER LEVELS:
 DRILLING METHOD 3-1/4 inch Hollow Stem Auger ▽ DURING DRILLING 8.50 ft
 LOGGED BY A. Rau CHECKED BY A. Spears ▽ AFTER DRILLING 8.33 ft
 NOTES Backfilled with auger cuttings ▽ COLLAPSE DEPTH 10.50 ft

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN (tsf) UNC STRENGTH (psf)	NATURAL MOISTURE CONTENT (%)	▲ SPT N VALUE ▲	
									10	20
0.0			6 inches of SANDY TOPSOIL							
			FILL - brown, sand with gravel, moist							
	2.5		FILL - brown, sandy clay with gravel and silt, trace organics, dry	SS 1		4-6-5 (11)	0			
			FILL - brown, sandy clay with gravel and silt, trace organics, dry	SS 2		2-4-3 (7)	1.0			
	5.0		FILL - brown, sandy clay with gravel and silt, trace organics and cobbles, dry	SS 3		5-8-9 (17)				
	7.5		CLAYEY SAND (SP-SC) - brown, with gravel, trace cobbles, dense to medium dense, wet	SS 4		10-21-23 (44)				
	10.0									
	12.5									
	15.0			SS 5		5-9-14 (23)				

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Bottom of borehole at 15.0 feet.



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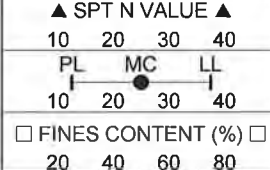
BORING NUMBER: B-2

PAGE 1 OF 1

CLIENT Stantec PROJECT NAME Nichols Arboretum Water Main
 PROJECT NUMBER 3162040011 PROJECT LOCATION Ann Arbor, MI
 DATE STARTED 5/3/16 COMPLETED 5/3/16 GROUND ELEVATION +/-
 DRILLING CONTRACTOR Brax Drilling GROUND WATER LEVELS:
 DRILLING METHOD 3-1/4 inch Hollow Stem Auger ▽ DURING DRILLING 4.33 ft
 LOGGED BY A. Rau CHECKED BY A. Spears ▼ AFTER DRILLING 3.58 ft
 NOTES Backfilled with auger cuttings ▼ COLLAPSE DEPTH 10.25 ft

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN (tsf) UNC STRENGTH (psf)	NATURAL MOISTURE CONTENT (%)	▲ SPT N VALUE ▲					
									10	20	30	40		
0.0			15 inches of SANDY TOPSOIL											
	2.5		CLAYEY SAND (SW-SC) - brown, with gravel and silt, very loose, moist	SS 1		2-1-2 (3)								
	5.0		SILTY SAND (SW-SM) - brown, with gravel, very loose, wet	SS 2		1-1								
	7.5			SS 3		0-0-0 (0)								
	10.0		SILTY SAND (SW-SM) - brown, with gravel, medium dense, wet	SS 4		8-7-4 (11)								
	12.5													
	15.0		CLAYEY SAND (SP-SM) - fine, brown, trace gravel, medium dense, wet	SS 5		4-10-12 (22)								

DRAFT



Bottom of borehole at 15.0 feet.

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 be deemed a material breach of the terms of the contract and grounds for termination of same by the City.

Verdeterre Contracting, Inc.

Company Name
Signature of Authorized Representative Christopher K. Brown, President
Date 6-2-2016

Print Name and Title
2618 Hannan Road, Canton, MI 48188

Address, City, State, Zip
734/697-4166 Chris@verdeterre.net

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 \$12.93/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 \$14.43/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 (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
- [X] Employees who are assigned to any covered City contract/grant will be paid at or above the applicable living wage with health benefits
- (b) 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.
- (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.
- (e) 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.

Verdeterre Contracting, Inc.

Company Name

 6-2-2016
Signature of Authorized Representative Date

Christopher K. Brown, President

Print Name and Title

2618 Hannan Road, Canton MI 48188

Address, City, State, Zip

734/697-4166 Chris@verdeterre.net

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**

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

\$12.93 per hour

If the employer provides health care benefits*

\$14.43 per hour

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

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

ENFORCEMENT

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

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

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

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

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



Vendor Conflict of Interest Disclosure Form

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

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

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

- 1. No City official or employee or City employee's immediate family member has an ownership interest in vendor's company or is deriving personal financial gain from this contract.
2. No retired or separated City official or employee who has been retired or separated from the City for less than one (1) year has an ownership interest in vendor's Company.
3. No City employee is contemporaneously employed or prospectively to be employed with the vendor.
4. Vendor hereby declares it has not and will not provide gifts or hospitality of any dollar value or any other gratuities to any City employee or elected official to obtain or maintain a contract.
5. Please note any exceptions below: NONE

Table with 2 columns: Vendor Name, Vendor Phone Number. Vendor Name: Verdeterre Contracting, Inc. Vendor Phone Number: 734/697-4166. Section: Conflict of Interest Disclosure * with checkboxes for Relationship to employee, Interest in vendor's company, and Other.

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

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

Handwritten signature of Christopher K. Brown

6-2-16 Date

Christopher K. Brown Printed Name of Vendor Authorized Representative

PROCUREMENT USE ONLY

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

**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.

Verdeterre Contracting, Inc.

Company Name



6-2-2016

Signature of Authorized Representative

Date

Christopher K. Brown, President

Print Name and Title

2618 Hannan Road, Canton, MI 48188

Address, City, State, Zip

734/697-4166 Chris@verdeterre.net

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/departments/city-clerk](http://www.a2gov.org/departments/city-clerk)

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

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

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

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

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

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

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