

**CITY OF ANN ARBOR
INVITATION TO BID**



**SOUTHSIDE INTERCEPTOR SEWER LINING PROJECT –
Phase III - ITB No. 4438**

**Proposal Due Date: May 17, 2016
On or Before 10:00 A.M. (Local Time)**

Public Services Area/Project Management Services Unit

Issued By:

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

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- City of Ann Arbor 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*

NOTICE OF PRE-BID CONFERENCE

A pre-bid conference for this project will be held on **Wednesday, May 4, 2016 at 3:00 p.m.** in the Basement Conference Room, City Hall, located at, 301 E. Huron Street, Ann Arbor, Michigan 48104.

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 **Friday, May 6, 2016 by 5:00p.m.** and should be addressed as follows:

Specification/Scope of Work questions emailed to Anne Warrow at awarrow@a2gov.org
Bid Process and Compliance questions emailed to Colin Spencer at 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 **Anne Warrow** at **awarrow@a2gov.org** after discovery as possible. Further, the contractor and/or service provide shall not be allowed to take advantage of errors, omissions or discrepancies in the specifications.

Addenda

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

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

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

Bid Submission

All Bids are due and must be delivered to the City of Ann Arbor Procurement Unit on or before **Tuesday, May 17, 2016 by 10:00 a.m. EST.** Bids submitted late or via oral, telephonic, telegraphic, electronic mail or facsimile **will not** be considered or accepted.

Each Bidder must submit one (1) original Bid and **one (1)** Bid copy in a sealed envelope clearly marked: **ITB No. 4438 – Southside Interceptor Sewer Lining Project – Phase III.**

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.

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

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

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

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

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

Award

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

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

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-1, Article III of the Contract. If these time requirements can not be met, the Bidder must stipulate on Bid Form Section 3 - Time Alternate its schedule for performance of the work. Consideration will be given to time in evaluating bids.

Liquidated Damages

A liquidated damages clause, as given on page C-1, 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-1, outlines the requirements for payment of prevailing wages and for payment of a "living wage" to employees providing service to the City under this contract. The successful bidder and its subcontractors must comply with all applicable requirements and provide 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 _____, the undersigned, as Bidder, proposes to perform at the sites in and/or around Ann Arbor, Michigan, all the work included herein for the amounts set forth in the Bid Forms.

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

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

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

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

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

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

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

SIGNED THIS _____ DAY OF _____, 201__.

Bidder's Name

Authorized Signature of Bidder

Official Address

(Print Name of Signer Above)

Telephone Number

Email Address for Award Notice

LEGAL STATUS OF BIDDER

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

Bidder declares that it is:

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

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

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

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

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

Authorized Official

_____ **Date** _____, 201__

(Print) Name _____ Title _____

Company: _____

Address: _____

Contact Phone () _____ Fax () _____

Email _____

BID FORM

Section 2 - Material and Equipment Alternates

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

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

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

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

Signature of Authorized Representative of Bidder _____ Date _____

BID FORM

Section 3 - Time Alternate

If the Bidder takes exception to the time stipulated in Article III of the Contract, Time of Completion, page C-1, it is requested to stipulate below its proposed time for performance of the work. Consideration will be given to time in evaluating bids.

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

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

Signature of Authorized Representative of Bidder _____ Date _____

BID FORM

Section 4 - Major Subcontractors

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

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

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

<u>Subcontractor (Name and Address)</u>	<u>Work</u>	<u>Amount</u>
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If the Bidder does not expect to engage any major subcontractor, the Bidder **MUST** complete the following statement:

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

Signature of Authorized Representative of Bidder _____ Date _____

SAMPLE STANDARD CONTRACT

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

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 _____ ("Contractor")

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

(Address)

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

ARTICLE I - Scope of Work

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

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

General Conditions
Standard Specifications
Detailed Specifications
Plans
Addenda

ARTICLE II - Definitions

Administering Service Area/Unit means **Project Management Services Unit**

Project means **ITB No. 4438 – Southside Interceptor Sewer Lining Project – Phase III**

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-three (63)** 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:

_____ Dollars (\$_____)

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

ARTICLE V - Assignment

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

ARTICLE VI - Choice of Law

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

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

ARTICLE VII - Relationship of the Parties

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

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

ARTICLE VIII - Notice

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

ARTICLE IX - Indemnification

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

ARTICLE X - Entire Agreement

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

FOR CONTRACTOR

By _____

Its: _____

FOR THE CITY OF ANN ARBOR

By _____
Christopher Taylor, Mayor

By _____
Jacqueline Beaudry, City Clerk

Approved as to substance

By _____
Tom Crawford, Interim City
Administrator

By _____
Craig Hupy, Public Services Area
Administrator

Approved as to form and content

Stephen K. Postema, City Attorney

PERFORMANCE BOND

- (1) _____ of _____ (referred to as "Principal"), and _____, a corporation duly authorized to do business in the State of Michigan (referred to as "Surety"), are bound to the City of Ann Arbor, Michigan (referred to as "City"), for \$ _____, the payment of which Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by this bond.
- (2) The Principal has entered a written Contract with the City dated _____, 2016, for: **ITB No. 4438 – Southside Interceptor Sewer Lining Project – Phase III** 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 : **ITB No. 4438 – Southside Interceptor Sewer Lining Project – Phase III**; 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)

Approved as to form:

Stephen K. Postema, City Attorney

(Name of Principal)

By _____
(Signature)

Its _____
(Title of Office)

Name and address of agent:

GENERAL CONDITIONS

Section 1 - Execution, Correlation and Intent of Documents

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

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

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

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

Section 2 - Order of Completion

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

Section 3 - Familiarity with Work

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

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

Section 4 - Wage Requirements

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

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

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

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

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

Section 5 - Non-Discrimination

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

Section 6 - Materials, Appliances, Employees

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

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

Adequate sanitary facilities shall be provided by the Contractor.

Section 7 - Qualifications for Employment

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

Section 8 - Royalties and Patents

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

Section 9 - Permits and Regulations

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

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

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

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

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

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

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

Section 11 - Inspection of Work

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

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

inspection.

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

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

Section 12 - Superintendence

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

Section 13 - Changes in the Work

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

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

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

Section 14 - Extension of Time

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

- (1) When work under an extra work order is added to the work under this Contract;
- (2) When the work is suspended as provided in Section 20;

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

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

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

Section 15 - Claims for Extra Cost

If the Contractor claims that any instructions by drawings or other media issued after the date of the Contract involved extra cost under this Contract, it shall give the Supervising Professional written notice within 7 days after the receipt of the instructions, and in any event before proceeding to execute the work, except in emergency endangering life or property. The procedure shall then be as provided for Changes in the Work-Section 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

The Contractor shall procure and maintain during the life of this Contract, including the guarantee period and during any warranty work, such insurance policies, including those set forth below, as will protect itself and the City from all claims for bodily injuries, death or property damage which may arise under this Contract; whether the act(s) or omission(s) giving rise to the claim were made by the Contractor or by any subcontractor or anyone employed by them directly or indirectly. In the case of all contracts involving on-site work, the Contractor shall

provide to the City, before the commencement of any work under this contract, certificates of insurance and other documentation satisfactory to the City demonstrating it has obtained the policies and endorsements required on behalf of itself, and when requested, any subcontractor(s). The certificates of insurance endorsements and/or copies of policy language shall document that the Contractor satisfies the following minimum requirements

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

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

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

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

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

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

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

- (3) Insurance companies and policy forms are subject to approval of the City Attorney, which approval shall not be unreasonably withheld. Documentation must provide and demonstrate an unconditional 30 day written notice of cancellation in favor of the City of Ann Arbor. Further, the documentation must explicitly state the following: (a) the policy number; name of insurance company; name and address of the agent or authorized representative; name and address of insured; project name; policy expiration date; and

specific coverage amounts; (b) any deductibles or self-insured retentions which shall be approved by the City, in its sole discretion; (c) that the policy conforms to the requirements specified Contractor shall furnish the City with satisfactory certificates of insurance and endorsements prior to commencement of any work. Upon request, the Contractor shall provide within 30 days a copy of the policy(ies) to the City. If any of the above coverages expire by their terms during the term of this Contract, the Contractor shall deliver proof of renewal and/or new policies and endorsements to the Administering Service Area/Unit at least ten days prior to the expiration date.

- (4) Any Insurance provider of Contractor shall be admitted and authorized to do business in the State of Michigan and shall carry and maintain a minimum rating assigned by A.M. Best & Company's Key Rating Guide of "A-" Overall and a minimum Financial Size Category of "V". Insurance policies and certificates issued by non-admitted insurance companies are not acceptable unless approved in writing by the City.
- (5) City reserves the right to require additional coverage and/or coverage amounts as may be included from time to time in the Detailed Specifications for the Project.
- (6) The provisions of General Condition 28 shall survive the expiration or earlier termination of this contract for any reason.

Section 29 - Surety Bonds

Bonds will be required from the successful bidder as follows:

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

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

Section 30 - Damage Claims

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

Section 31 - Refusal to Obey Instructions

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

Section 32 - Assignment

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

Section 33 - Rights of Various Interests

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

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

Section 34 - Subcontracts

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

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

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

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

Section 35 - Supervising Professional's Status

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

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

Section 36 - Supervising Professional's Decisions

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

Section 37 - Storing Materials and Supplies

Materials and supplies may be stored at the site of the work at locations agreeable to the City unless specific exception is listed elsewhere in these documents. Ample way for foot traffic and

drainage must be provided, and gutters must, at all times, be kept free from obstruction. Traffic on streets shall be interfered with as little as possible. The Contractor may not enter or occupy with agents, employees, tools, or material any private property without first obtaining written permission from its owner. A copy of the permission shall be furnished to the Supervising Professional.

Section 38 - Lands for Work

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

Section 39 - Cleaning Up

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

Section 40 - Salvage

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

Section 41 - Night, Saturday or Sunday Work

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

Section 42 - Sales Taxes

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

Section 43

CONTRACTOR'S DECLARATION

I hereby declare that I have not, during the period _____, 20____, to _____, 20____, performed any work, furnished any materials, sustained any loss, damage or delay, or otherwise done anything in addition to the regular items (or executed change orders) set forth in the Contract titled : ITB No. 4438 – Southside Interceptor Sewer Lining Project – Phase III, 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.

Standard Specifications are available online:

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

DETAILED SPECIFICATION FOR PROJECT SCHEDULE

Examination of Plans, Specifications, and Work Site: Bidders shall carefully examine the Bid Form, plans, specifications and the work site until the Bidder is satisfied as to all local conditions affecting the contract and the detailed requirements of construction. The submission of the bid shall be considered prima facie evidence that the Bidder has made such examination and is satisfied as to the conditions to be encountered in performing the work and all requirements of the contract.

The entire work under this Contract shall be completed in accordance with, and subject to, the scheduling requirements as outlined below, and all other requirements of the Contract Documents.

1. By no later than **June 6, 2016** the Contractor shall submit a detailed schedule of work for the Engineer's review and approval. The proposed schedule must fully comply with the scheduling requirements contained in this Detailed Specification. The Contractor shall update the approved work schedule each week and present it to the Engineer at the weekly progress meeting.
2. The Contractor will receive two (2) copies of the Contract, for his/her execution, on or before **June 21, 2016**. The Contractor shall properly execute both copies of the Contract and return them, with the required Bonds and Insurance Certificate, to the City by **July 1, 2016**.
3. Contractor may begin construction on or before **July 25, 2016** and only after receiving the copy of executed contract documents and the Notice to Proceed from the City. Appropriate time extensions shall be granted if the Notice to Proceed is delayed due to the circumstances controlled by the City.
4. The entire work under this Contract, including but not limited to the stabilization of all disturbed areas, removal of all traffic control devices, and the submittal of all final video inspections of lined sewers shall be completed by **September 16, 2016** or within **fifty-three (53)** calendar days from the date of Notice to Proceed.

Time is of the essence in the performance of the work of this contract. The Contractor is expected to mobilize sufficient personnel and equipment, and work throughout all authorized hours in order to complete the project by the final completion date. Should the Contractor demonstrate that work must occur on Sundays in order to maintain the project schedule, they may do so between the hours of 9:00 a.m. and 5:00 p.m. with prior approval from the City. The Contractor will submit authorization requests for any Sunday work a minimum of three working days in advance of the day of the proposed work. There will be no additional compensation due to the Contractor for work performed on Sundays.

Once the Notice to Proceed is issued, working days will start being counted, regardless of the status of the Contractor's submittals. The work on this project shall not be initiated by the Contractor or his sub-contractor until all of the listed information has been reviewed and approved by the Engineer.

1. A proposed schedule
2. Identification of all proposed access routes
3. Identification of set up locations for cleaning, video inspections and lining operations
4. Lining procedures and material
5. Bypass Pumping Plan

Contract time shall continue while the submittals are being reviewed and during the time requested revisions are being made. Delays encountered due to Engineer requested revisions shall not be considered as grounds of an extension of contract time.

The Contractor shall schedule the work requiring access from US23, in accordance with the MDOT Individual Construction Permit #81074-038568-16-041416, which can be found in Appendix A. The Contractor shall submit an updated schedule for this work at least seven days prior to the commencement of this work to allow for "Advance Notice" to be submitted to MDOT.

Costs for the Contractor to organize, coordinate, and schedule all of the work of the project, including compliance with the MDOT Construction Permit #81074-038568-16-041416, will not be paid for separately, but shall be included in the bid price of the pay item "General Conditions."

Failure to complete all work as specified herein within the times specified herein, including time extensions granted thereto as determined by the Engineer, shall entitle the City to deduct from the payments due the Contractor, **\$350.00** in "Liquidated Damages", and not as a penalty, for delays in the completion of the work for each and every calendar day beyond the **fifty-three (53)** calendar days from the date of Notice to Proceed.

Liquidated Damages will be assessed until the required work is completed in the current construction season. If, with the Engineer's approval, work is extended beyond seasonal limitations, the assessment of Liquidated Damages will be discontinued until the work is resumed in the following construction season.

The City's decision to delete locations, add locations, change the limits of construction at any locations, or, the City's contribution to a delay of the construction at any one location shall not entitle the Contractor to receive additional compensation for work on any other location(s), nor shall it relieve the Contractor of any responsibilities for completion of work on any other location(s).

MEASUREMENT AND PAYMENT

If the construction contract is not completed within the estimated 53 consecutive calendar days, and any extensions of time granted thereto, at the sole discretion of the City of Ann Arbor, this Contract may be terminated with no additional compensation due to the Contractor, and the Contractor may be forbidden to bid on future City of Ann Arbor projects for a period of at least three (3) years. If the City elects to terminate the this Construction Contract due to non-performance, contract items paid for on a Lump Sum basis will be pro-rated based on percentage equal to the percentage of the contract work completed.

DETAILED SPECIFICATION FOR MAINTENANCE OF TRAFFIC

DESCRIPTION

Traffic shall be maintained in accordance with the City of Ann Arbor Public Services Department Standard Specifications except as specified in Sections 104.11, 812, and 922 of the Michigan Department of Transportation (MDOT) 2012 Standard Specifications for Construction, the Michigan Manual of Uniform Traffic Control Devices, Latest Revised Edition (MMUTCD) and as amended herein.

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 traffic. This includes, but is not limited to, advance, regulatory, and warning signs; barricades and channeling devices at intersecting streets on which traffic is to be maintained; barricades at the ends of the project and at right-of-way lines of intersecting streets; changeable message signs; lighted arrow boards, and moving traffic control devices for construction operations.

MATERIALS

The materials and equipment shall meet the requirements specified in the corresponding sections of the MDOT 2012 Standard Specifications for Construction and MMUTCD.

Maintenance of Local Traffic

Unless otherwise indicated on the plans, all side roads shall not be closed to through traffic except during construction operations of short duration and only upon written approval of the Engineer.

Local access shall be maintained at all times for emergency vehicles, refuse pick-up, mail delivery and ingress/egress to private properties.

Contractor must accommodate the safe access to the residential buildings and businesses located within construction area.

A lane-closure permit shall be obtained by the Contractor from the City Transportation Division, at least 48 hours in advance of any proposed lane or street closing.

The hours of work on all Local streets are 7:00 a.m. to 8:00 p.m., Monday through Saturday, or as specified on the lane-closure permit. No equipment will be allowed in the street before or after these hours. Local streets may only be closed to through traffic (local access only) with written authorization of the Engineer. Work must be completed each day such that all streets are re-opened to through traffic by 8:00 p.m. unless otherwise specified, directed, or authorized in writing by the Engineer. All major changes in traffic control shall be made either between 9:30 a.m. and 3:30 p.m., or between 7:00 p.m. and 6:30 a.m. in order to minimize interference with rush-hour traffic. All traffic controls must be in-place and ready for traffic each day by 6:30 a.m. and 3:30 p.m.

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.

The Contractor shall maintain pedestrian traffic at all times covered under the pay item "General Conditions". For maintaining normal pedestrian traffic while performing sidewalk and driveway repair, Type I barricades shall be placed by the Contractor, as directed by the Engineer. "Sidewalk Closed" and/or "Cross Here" signs shall be placed, by the Contractor, when directed by the Engineer.

During the sewer manhole cleaning, video inspection and lining, parking of residences in the construction area will not be allowed. Temporary "No Parking" signs will be supplied by the City. Any vehicle parked in the construction zone shall be ticketed and towed at the owner's expense.

At times when it becomes necessary to temporarily obstruct local traffic during the performance of the work, the Contractor shall provide traffic regulation in conformance with Chapter 6E of the MMUTCD. A minimum of two traffic regulators are required. The cost of traffic regulation shall be included in the pay item "Minor Traffic Control"

The Contractor shall use quantities of dust palliative, maintenance aggregate, and cold patching mixture for use as temporary base, surfacing, and dust control at utility crossings, side roads and driveways (wherever required to maintain traffic), and where directed by the Engineer to maintain local access. The cost for the use of dust palliative, maintenance aggregate and HMA wedging mixture, as required and directed by the Engineer for maintenance of traffic and local access, shall be included in contract pay item "Item No 201, General Conditions, Max. \$ _____" and it will not be paid for separately.

Maintain access to all mailboxes for users and the U.S. Postal Service at all times. Mailboxes and newspaper boxes that are in the right of way where construction is to be performed shall be removed and reset immediately in a temporary location near the construction area that is approved by the Engineer. The Contractor may propose the temporary relocation of mail boxes, subject to the approval of the Engineer. In either case, the temporary relocation of mail boxes will not be paid for separately. There are 34 mailboxes located within the project grading limits that may need to be temporarily relocated and then re-established in their permanent locations. Upon completion of the construction, all mailboxes and newspaper boxes, including their supports, shall be repositioned in their permanent locations, outside of sand filters, as approved by the Engineer. This work shall be included in the contract unit price for the contract pay item "Item No 201, General Conditions, Max. \$ _____" and it will not be paid for separately.

The Contractor shall perform the work of this Contract while maintaining traffic in accordance with the Contract Documents as specified herein.

The Contractor shall place portable, changeable message signs a minimum of one week prior to the start of construction in locations indicated by the Engineer.

The Contractor shall schedule the work requiring access from US23, in accordance with the MDOT Individual Construction Permit #81074-038568-16-041416, which can be found in Appendix A. The Contractor shall implement the traffic control on US23 in accordance with the details shown on sheet 4 of the construction plans.

**DETAILED SPECIFICATION
FOR
ITEM #201 – GENERAL CONDITIONS, MAX. \$85,000**

DESCRIPTION

This 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:

- Scheduling and organization of all work, subcontractors, suppliers, testing, inspection, surveying, and staking
- Coordination of, and cooperation with, other contractors, agencies, departments, and utilities
- Protection and maintenance of Utilities
- Placing, maintaining, and removing all soil erosion and sedimentation controls (as specified or as shown on project plans)
- Maintaining drainage
- Maintaining driveway 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
- Storing all materials and equipment off lawn areas
- Temporary relocation and final replacement/re-setting of mailboxes
- Site clean-up
- Coordination efforts to furnish various HMA mixtures as directed by the Engineer
- Furnishing and operating vacuum-type street cleaning equipment a minimum of once per week or more frequently as directed by the Engineer
- Furnishing and operating both vibratory plate and pneumatic-type (“pogo-stick”) compactors
- Furnishing and operating a backhoe during all work activities
- Furnishing and operating a jackhammer and air compressor during all work activities
- Noise and dust control
- Mobilization(s) and demobilization(s)
- Furnishing submittals and certifications for materials and supplies
- Disposing of excavated materials and debris
- Removal of shrubs, brush, and trees less than 8” diameter as directed by Engineer
- Trimming of trees to accommodate intersection sight distance as shown on plans and directed by Engineer.
- Fencing to protect excavation over 1’ in depth during non-work hours and trees as shown on plans or as directed by the Engineer. The fencing must be a minimum of 36” high, be constructed of orange HDPE material, and reasonably secured to prevent access.
- All miscellaneous and incidental items such as overhead, insurance, and permits.
- Meeting all requirements relating to Debarment Certification, Davis Bacon Act, and Disadvantaged Business Enterprise, and providing the necessary documentation.

MEASUREMENT AND PAYMENT

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

The completed work as measured for this item of work will be paid for at the Contract Unit Price for the following Contract (Pay) Item:

<u>PAY ITEM</u>	<u>PAY UNIT</u>
General Conditions, Max. \$85,000	Lump Sum

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

DETAILED SPECIFICATION FOR ITEM #202 – DIGITAL AUDIO VISUAL COVERAGE

DESCRIPTION

This work shall include digital audiovisual record of the physical, structural, and aesthetic conditions of the construction site and adjacent areas as provided herein. This work will be performed for the entire project limits for Phase 2014 prior to the start of construction.

The audio-visual record shall be:

1. Of professional quality, providing a clear and accurate audio and visual record of existing conditions.
2. Prepared within the four (4) week period immediately prior to the start of construction
3. Furnished to the Engineer a minimum of one (1) week prior to bringing any materials or equipment within the areas described in this Detailed Specification.
4. Carried-out under the supervision of the Engineer.

The Contractor shall furnish one (1) copy of the completed audiovisual record to the Engineer. An index of the footage shall be included, including the street and house number, which will enable any particular area of the project to be easily found. This includes indexing the files according to street. The Contractor shall retain a second copy of the audiovisual record for his/her own use.

Any portion of the record determined by the Engineer to be unacceptable for the documentation of existing conditions shall be recorded again at the Contractor's sole expense prior to mobilizing onto the site.

PRODUCTION

The audio-visual record shall be completed in accordance with the following minimum requirements:

1. DVD Format, No Editing – The audio-visual record shall be done in color using equipment that allows audio and visual information to be recorded. Editing of the digital record, other to provide stationing and annotation on address, shall not be allowed and the speed and electronics of the videotaping equipment and DVD shall be equal to the 1080p video-recording standard.
2. Perspective / Speed / Pan / Zoom – To ensure proper perspective, the distance from the ground to the camera lens shall not be less than 5 feet and the recording must proceed in the general direction of travel at a speed not to exceed 48 feet per minute. Pan and zoom rates shall be controlled sufficiently so that playback will ensure quality of the object viewed.
3. Display – The recording equipment shall have transparent time, date stamp and digital annotation capabilities. The final copies of the tape shall continuously and simultaneously display the time (hours:minutes:seconds) and the date (month/date/year) in the upper left-hand corner of the frame. Accurate project stationing, where applicable, shall be included in the lower half of the frame in standard format (i.e. 1+00). Below the stationing periodic information is to be shown, including project name, name of area shown, street address, direction of travel, viewing direction, etc.

If in the event, the stationing has not been established on-site, refer to the plans and approximate the proposed stationing.

4. Audio Commentary / Visual Features – Locations relative to project limits and landmarks must be identified by both audio and video means at intervals no less frequent than 100 feet along the recording route. Additional audio commentary shall be provided as necessary during recording to describe streets, buildings, landmarks, and other details, which will enhance the record of existing conditions.

5. Visibility / Ground Cover – The recording shall be performed during a time of day when good visibility is available. Recording shall not be performed during periods of precipitation or when snow, leaves, or other natural debris obstruct the area being recorded. The Contractor shall notify the Engineer in writing in the event that the weather or snow cover is anticipated to cause a delay in recording the audio-visual record.

COVERAGE

The audio-visual record coverage shall include the following:

1. General Criteria – This general criteria shall apply to all recording and shall include all areas where construction activities will take place or where construction vehicles or equipment will be operated or parked and or where materials will be stored. The recording shall extend an additional 50 feet outside of all areas of construction. The recording shall include all significant, existing man-made and natural features including driveways, sidewalks, utility covers, utility markers, utility poles, other utility features, traffic signal structures and features, public signs, private signs, fences, landscaping, trees, shrubs, other vegetation, and other similar or significant features.
2. Other Areas – The Contractor shall record at his sole expense other areas where, in his/her opinion, the establishment of a record of existing conditions is warranted. The Contractor shall notify the Engineer in writing of such areas.
3. Street List – This item shall include the recording of all of the streets as listed in the Detailed Specification for Progress Schedule and Construction Limits.

The Engineer may direct the recording of other minor areas not specified herein at the Contractor’s sole expense.

AUDIOVISUAL RECORDING SERVICES

The following companies are known to be capable of providing the audio-visual recording services required by this Detailed Specification and shall be utilized, unless the Contractor receives prior written approval from the Engineer to utilize another company of comparable or superior qualifications.

- Construction Video Media
- Midwest Company
- Topo Video, Inc.
- Video Media Corp

MEASUREMENT AND PAYMENT

The completed work as measured for these items of work will be paid for at the Contract Unit Prices for the following Contract (Pay) Items:

PAY ITEM

Digital Audiovisual Coverage

PAY UNIT

Lump Sum

Audiovisual Record Coverage shall include all labor, equipment, and materials required to perform the recording and to provide the finished audio-visual record to the Engineer. The unit price includes recording the entire project limits, for each and every street, as described above.

**DETAILED SPECIFICATION
FOR
ITEM #203 - MINOR TRAFFIC DEVICES, MAX. \$10,000**

DESCRIPTION

The work of Temporary Traffic Devices shall consist of protecting and maintaining vehicular and pedestrian traffic as shown on the plans, in the Maintenance of Traffic specification, and as directed by the Engineer, in accordance with Sections 103.05, 103.06, and 812 of the 2012 MDOT Standard Specifications for Construction; Part 6 of the Michigan Manual of Uniform Traffic Control Devices, Latest Revised Edition (MMUTCD); and the City Standard Specifications, except as modified herein. These devices include, but not limited to, advance, regulatory, and warning signs; barricades and channeling devices at intersecting streets on which traffic is to be maintained; barricades at the ends of the project and at right-of-way lines of intersecting streets; changeable message signs; lighted arrow boards; sign/signal covers and pavement marking cover tape for construction operations.

The work of Minor Traffic Devices shall include, but not be limited to:

- The furnishing and operating of miscellaneous signs, warning devices, flag-persons, and cones;
- The operation of additional signs furnished by the City;
- Furnishing and installing meter bags;
- Coordinating with the City to have meter heads removed and reinstalled;
- Maintaining pedestrian traffic;
- Temporarily covering traffic controls;
- Temporarily covering existing signs as directed;
- Any and all other miscellaneous and/or incidental items which are necessary to properly perform the work.

The Contractor shall maintain vehicular and pedestrian traffic during the work by the use of flag-persons, channelizing devices, and signs as necessary, as directed by the Engineer, and in accordance with MMUTCD. Typical applications for maintaining pedestrian traffic in accordance with the MMUTCD are included in this detailed specification.

MATERIALS, EQUIPMENT, AND CONSTRUCTION METHODS

General

Materials and equipment shall meet the requirements specified in the above-designated sections of the MDOT Standard Specifications.

All temporary traffic/pedestrian control devices furnished by the Contractor shall remain the property of the Contractor. The City shall not be responsible for stolen or damaged signs, barricades, barricade lights or other traffic maintenance items. The Contractor shall replace missing traffic control devices immediately, at no additional cost to the City.

All existing signs, and signs erected by the City of Ann Arbor on this project shall be preserved, protected, and maintained by the Contractor. Existing City owned signs which are damaged by the Contractor during the work will be repaired by the City at the Contractor's expense.

The Contractor shall temporarily cover conflicting traffic and/or parking signs when directed by the Engineer.

When traffic control devices have been damaged by, or due to, the negligence of the Contractor, his subcontractors or material suppliers, the traffic control devices shall be replaced at the Contractor's expense.

Lighted Plastic Drums; Barricades; Temporary Signs; Portable Changeable Message Signs; Lighted

Arrow Boards; Pavement Marking Cover Tape; Temporary Pavement Markings

The Contractor shall furnish and operate these items as directed by the Engineer.

Traffic control devices meeting current MDOT and MMUTCD specifications shall be used on this project.

Lighted plastic drums shall be sufficiently ballasted to minimize tipping.

Type I and III barricades shall have standard orange-and-white stripes on both sides of the barricade.

Sufficient signs shall be provided by the Contractor to ensure the safety of the workers and the general public in accordance with the current MMUTCD.

"Road Work Ahead" warning signs shall be placed, as indicated on the Plans, or as directed by the Engineer, prior to the start of work, regardless of the nature, magnitude or duration of the work.

Removable black pavement marking cover tape shall be used to cover conflicting pavement markings as directed by the Engineer.

Temporary pavement markings may be used within transition areas as directed by the Engineer and shall be removable.

MEASUREMENT AND PAYMENT

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.

The completed work as measured for this item of work will be paid for at the Contract Unit Price for the following Contract (Pay) Item:

PAY ITEM

Minor Traffic Devices, Max \$10,000

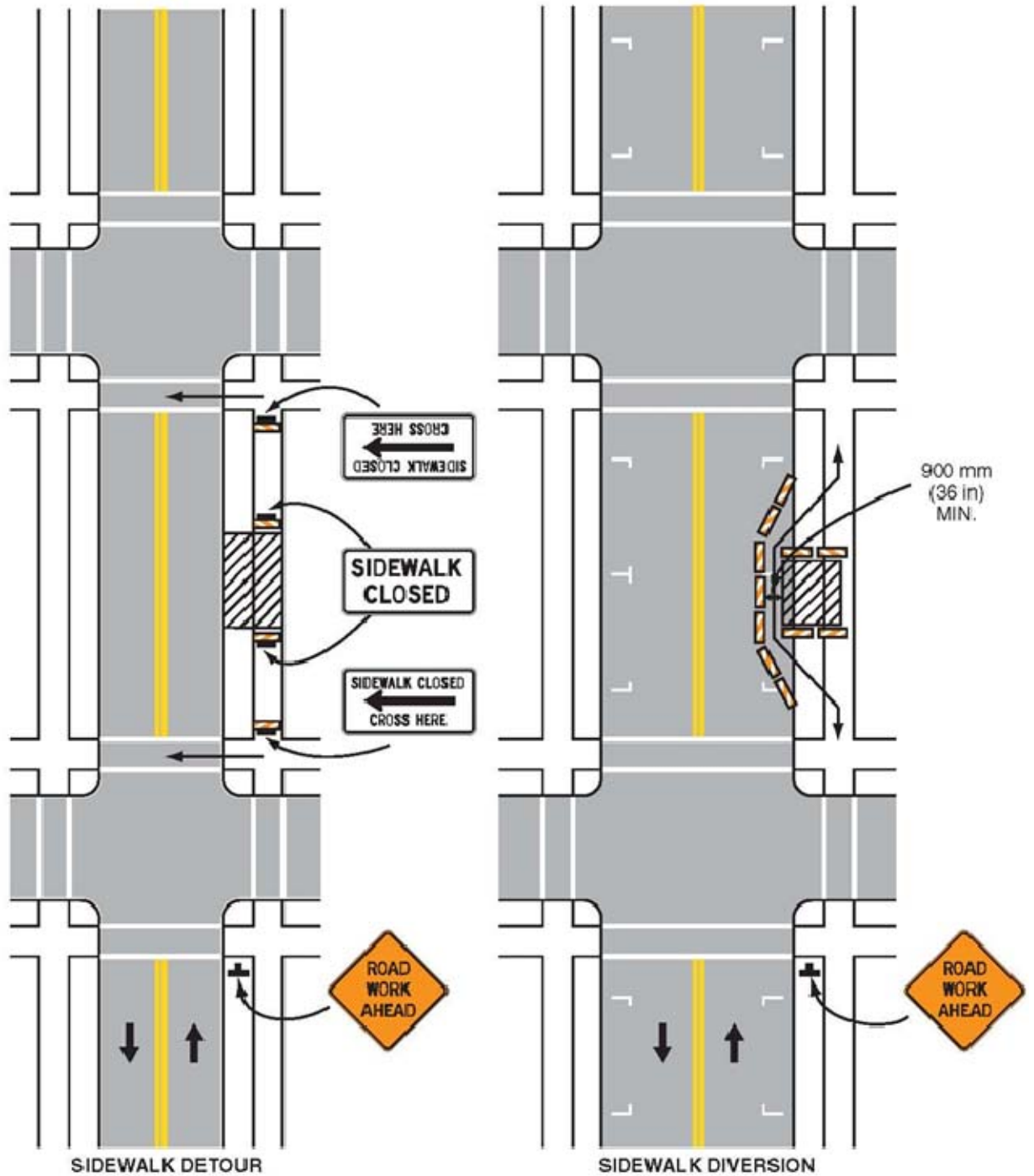
PAY UNIT

Lump Sum

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.



Figure 6H-28. Sidewalk Detour or Diversion (MI) (TA-28)

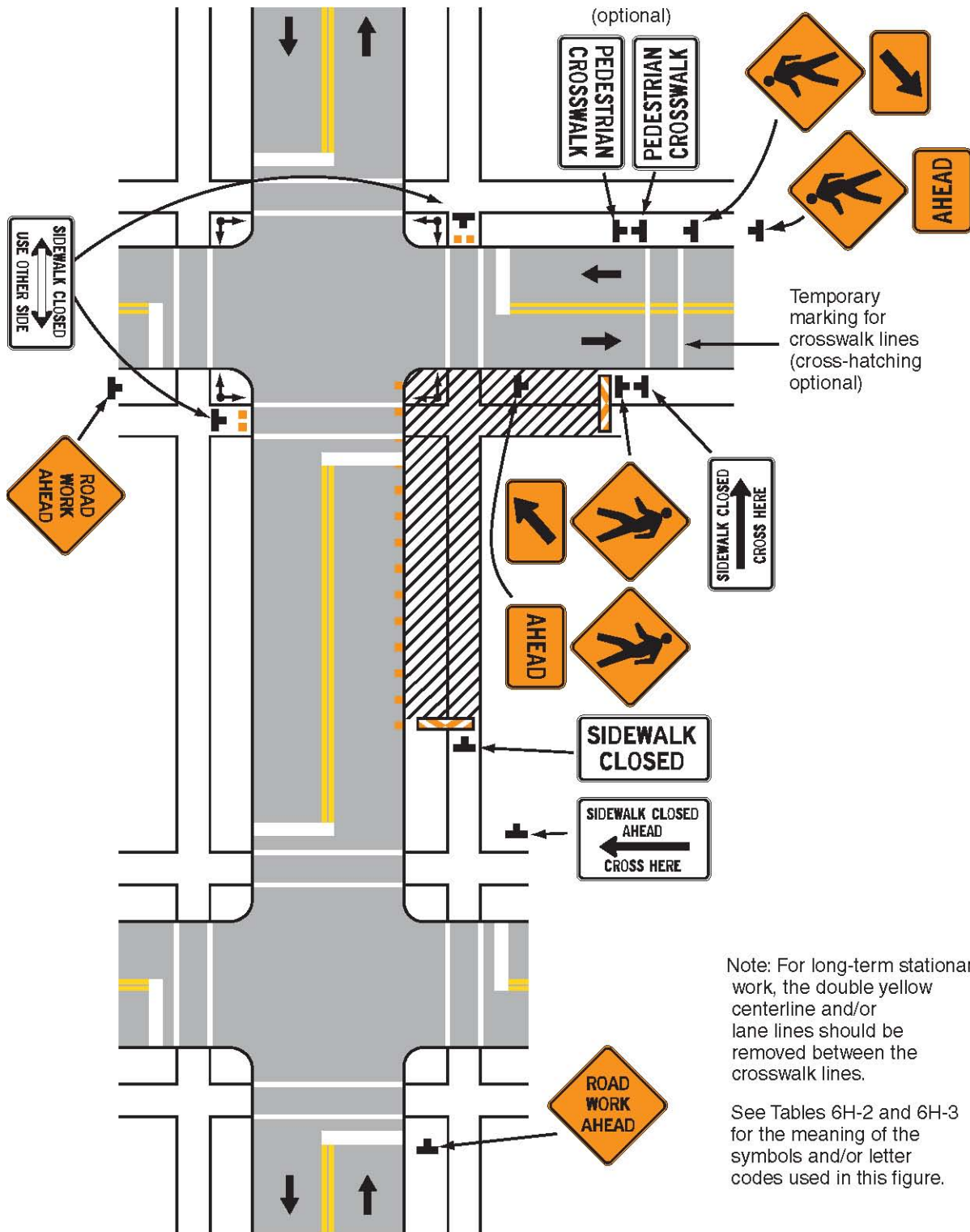


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Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

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Figure 6H-29. Cross walk Closures and Pedestrian Detours (MI) (TA-29)



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**DETAILED SPECIFICATION
FOR
ITEM #204 – CLEAN-UP AND RESTORATION, SPECIAL**

DESCRIPTION

This item of work shall conform to Division IX, Section II, Clean-Up & Restoration of the Public Services Area Standard Specifications, except as specified herein.

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 except for sand filter areas, which have separate surface restoration pay items. Mulch blankets are required on all seeded areas.

MATERIALS

The materials shall meet the requirements specified in the MDOT 2012 Standard Specifications as designated, as specified herein, and as approved by the Engineer:

- Seed shall be THM (Turf Loamy to Heavy) seed mixture as described in MDOT Table 816-1.
- Fertilizers shall be a Class A. The percentages by weight shall be 12- 12- 12, or as approved by the Engineer.
- Water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances.
- Mulch blankets shall be High Velocity Straw Mulch Blankets as specified in MDOT section 917.

MAINTENANCE AND ACCEPTANCE

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.

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.

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.

Cleanup and Restoration must be performed upon the completion of each stage of work and not as one single operation at the completion of the entire project.

MEASUREMENT AND PAYMENT

Measurement and payment for this item of work shall conform to Division IX, Section 2, Clean-Up & Restoration of the Public Services Area Standard Specifications except as modified herein.

The completed work for “Clean-Up & Restoration, Special” 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.

PAY ITEM

Clean-Up & Restoration, Special

PAY UNIT

Lump Sum

**DETAILED SPECIFICATION
FOR
ITEM #205 - "NO PARKING" SIGNS**

DESCRIPTION

This work shall consist of installing, maintaining and removing of "No Parking" signs and posts, as outlined herein and as referenced on the plans. "No Parking" signs shall be installed in accordance with the Public Services Department Standard Specifications and the most recent version of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD).

MATERIAL

All materials for this work shall conform to the requirements of the Public Services Department Standard Specifications.

CONSTRUCTION METHODS

Prior to the commencement of any construction activity, the Contractor will be required to place "No Parking" signs where directed by the Engineer. The Contractor shall obtain a permit for "Permission to Prohibit On-Street Parking" from the City of Ann Arbor Project Management Unit. This permit shall be obtained a minimum of 48 hours prior to the posting of "No Parking" signs.

The City will furnish "No Parking" signs to the Contractor at no cost. The Contractor shall furnish the signposts and shall securely bolt the signs to the signposts as directed by the Engineer. The Contractor shall install the signposts at least two feet deep into the ground, and there shall be a minimum 6-foot and maximum 7-foot clearance maintained between the bottom of the sign and the ground. The signs are to be placed at 150-foot intervals (or as necessary) to eliminate parking in the construction area.

The installation of "No Parking" signs shall be in accordance with the permit. "No Parking" signs shall be installed by the Contractor, as directed by the Engineer, at least 24 hours prior to the proposed start-of-work/enforcement date. "No Parking" signs shall be returned to the City at the completion of the work. The cost of unreturned signs will be backcharged to the Contractor. "No Parking" signs shall be covered by the Contractor, thereby allowing on-street parking, until between 24 and 36 hours prior to the start of the work. "No Parking" signs shall be covered by the Contractor whenever there is no work being performed for a period of time longer than 72 hours.

MEASUREMENT AND PAYMENT

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

"No Parking" signs will be measured as the maximum number installed on each street at any one time. The unit price includes the removal and return of "No Parking" signs to the City upon completion of the project. The Contractor shall be backcharged for the replacement costs for damaged or unreturned signs.

PAY ITEM

"No Parking" Signs

PAY UNIT

Each

DETAILED SPECIFICATION FOR COORDINATION AND COOPERATION WITH OTHERS AND WORK BY OTHERS

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.

The Contractor is hereby notified that the City of Ann Arbor Field Services Unit may be installing traffic control conduits, traffic signal sensors, and the like, at various locations.

No additional compensation will be paid to the Contractor, and no adjustments to contract unit prices will be made, due to delays and/or the failure of others in the performance of their work, nor for delays due to the encountering of existing utilities that are, or are not, shown on the Plans.

The following Utility Owners may have overhead and/or underground facilities located within the Right-of-Way:

- The City of Ann Arbor
- DTE - MichCon (Michigan Consolidated Gas Company)
- DTE - Edison (Detroit Edison Company)
- SBC - (Ameritech)
- Comcast
- MCI Communications
- Sprint Communications
- The University of Michigan
- Michigan Department of Transportation

On all projects:

"3 Working Days before you Dig - Call MISS DIG - Toll Free" Phone No. 1-800-482-7171.

The Owners of public or private utilities which will not interfere with the completed project and which do not present a hazard to the public or an extraordinary hazard to the Contractor's operations will not be required to move their facilities on or from the street right-of-way.

Stoppages created solely by the operations of the utility companies which delay utility revisions on any portion of this project may be considered as a basis of claim for an extension of time for project completion.

The Contractor shall schedule the work requiring access from US23, in accordance with the MDOT Individual Construction Permit #81074-038568-16-041416, which can be found in Appendix A. The Contractor shall submit an updated schedule for this work at least seven days prior to the commencement of this work to allow for "Advance Notice" to be submitted to MDOT.

Costs for this work will not be paid for separately, but shall be included in the bid price of the pay item "General Conditions."

DETAILED SPECIFICATION FOR SOIL EROSION CONTROL

The Contractor shall furnish, place, maintain and remove soil erosion and sedimentation control measures, including but not limited to, silt fence, and fabric filters at all drainage structures, all in accordance with all applicable City (and other governmental agencies) codes and standards, as directed by the Engineer, as detailed in the Standard Specifications, and as shown on the Plans.

DESCRIPTION

This work consists of installing and maintaining inlet filters in accordance with Section 208 of the 2012 Michigan Department of Transportation Standard Specifications for Construction and as shown on the plans. Filters shall be installed in existing and proposed inlets in order to minimize the erosion of soil and the sedimentation of water courses. The related work includes the installation, maintenance and removal of the filter cloth, cleaning as required during the performance of the project work, removing and disposing of accumulated sediment, and replacement of filters if required by the Engineer so as to provide a properly working inlet filter and a well-drained site.

MATERIALS

The inlet filters shall be in accordance with the REGULAR FLOW SILTSACK® manufactured by ACF Environmental (800) 448-3636; FLEXSTORM® Style FX manufactured by Advanced Drainage Systems, Inc. (800) 821-6710; CATCH-ALL® manufactured by Price & Company (866) 960-4300, or Engineer approved equal.

METHODS OF CONSTRUCTION

The Contractor shall install, maintain, clean, and re-install and/or replace inlet filters in accordance with the manufacturer's specifications and as directed by the Engineer. The Contractor shall dispose of debris off-site.

Costs for this work will not be paid for separately, but shall be included in the bid price of the Contract Item "Inlet Filter."

**DETAILED SPECIFICATION
FOR
VACUUM TYPE STREET AND
UTILITY STRUCTURE CLEANING EQUIPMENT**

The Contractor shall furnish and operate throughout the construction period, vacuum type street cleaning and utility structure cleaning equipment (Vac-All, Vactor, etc.) approved by the Engineer, as and when directed by the Engineer for dust control, for dirt/debris control, and for street cleaning immediately prior to, and for street and utility structure cleaning after any and all paving. The cleaning equipment shall be of sufficient power to remove dust, dirt, and debris from the pavement and from utility structures in and adjacent to the construction area.

Costs for this work will not be paid for separately, but shall be included in the bid price of the Contract Item "General Conditions."

DETAILED SPECIFICATION FOR MATERIALS AND SUPPLIES CERTIFICATIONS

The following materials and supplies shall be certified by the manufacturer or supplier as having been tested for compliance with the Specifications:

- HMA materials
- Hot-poured Joint Sealants
- Cements, coatings, admixtures and curing materials
- Sands and Aggregates
- Steel and Fabricated metal
- Portland Cement Concrete Mixtures
- Reinforcing Steel for Concrete
- Reinforcing Fibers for Concrete
- Pre-cast Concrete products
- Sanitary Sewer Pipe
- Storm Sewer Pipe
- Water Main Pipe
- High Density Polyethylene Pipe
- Edge Drain and Underdrain Pipe
- Geotextile Filter Fabric and Stabilization Fabric/Grids

The Contractor shall submit all certifications to the Engineer for review and approval a minimum of three business days prior to any scheduled delivery, installation, and/or construction of same.

Costs for this work will not be paid for separately, but shall be included in the bid price of the Contract Item "General Conditions."

**DETAILED SPECIFICATION
FOR
CONTRACT DRAWINGS/PLANS**

Bidders shall carefully check and review all Drawings, plans, and specifications, and advise the Engineer of any errors or omissions discovered. The Drawings/Plans may be supplemented by such additional Drawings/Plans and sketches as may be necessary or desirable as the work progresses. The Contractor shall perform all work shown on any additional or supplemental Drawings/Plans issued by the Engineer.

Bidders shall carefully examine the Bid Form, preliminary layouts, specifications, and the work sites until the Bidder is satisfied as to all local conditions affecting the contract and the detailed requirements of construction. The submission of the bid shall be considered prima facie evidence that the Bidder has made such examination and is satisfied as to the conditions to be encountered in performing the work and all requirements of the contract.

**DETAILED SPECIFICATION
FOR
WORKING IN THE RAIN OR IN THE DARK**

Working in the Rain

The Contractor shall not work in the rain unless authorized in writing by the Engineer.

The Engineer may delay or stop the work due to threatening weather conditions.

The Contractor shall not be compensated for unused materials or downtime due to rain, or the threat of rain.

The Contractor is solely responsible for repairing all damages to the work and to the site, including road infrastructures, road subgrades, and any adjacent properties, which are caused as a result of working in the rain.

Working in the Dark

The Contractor shall not work in the dark except as approved by the Engineer.

The Engineer may stop the work, or may require the Contractor to defer certain work to another day, if, in the Engineer's opinion, the work cannot be completed within the remaining daylight hours, or if inadequate daylight is present to either properly perform or inspect the work.

The Contractor will not be compensated for unused materials or downtime, when delays or work stoppages are directed by the Engineer for darkness and/or inadequate remaining daylight reasons.

The Contractor is solely responsible for repairing all damages to the work and to the site, including road infrastructures, road subgrades, and any adjacent properties, which are caused as a result of working in the dark.

**DETAILED SPECIFICATION
FOR
QUANTITIES AND UNIT PRICES**

Quantities as given are approximate and are estimated for bidding purposes. Quantities are not guaranteed and may vary by any amount. While it is the City's intent to complete the project substantially as drawn and specified herein, quantities may be changed or reduced to zero for cost savings or other reasons. **The City reserves the right to change the quantities, delete pipe lining quantities, or add pipe lining quantities, and no adjustment in unit price will be made for any change in any quantity.**

DETAILED SPECIFICATION FOR CONCRETE DURABILITY

DESCRIPTION

The Contractor shall furnish a Portland cement concrete mixture for this project that has been tested under this specification and shown to be resistant to excessive expansion caused by alkali-silica reactivity (ASR) and provides adequate air entrainment for freeze thaw durability. The Contractor shall construct the project with practices outlined in this specification.

MATERIALS

The materials provided for use on this project shall conform to the following requirements:

Portland cement	ASTM C 150
Fine Aggregate	ASTM C 33*
Coarse Aggregate	ASTM C 33*
Fly Ash, Class F	ASTM C 618
Slag Cement, Grade 100, 120	ASTM C 989
Silica Fume	ASTM C 1240
Blended Cements	ASTM C-595
Air Entraining Admixtures	ASTM C-260
Chemical Admixtures	ASTM C-494
White Membrane Cure	ASTM C-309 Type 2

* Fine and coarse aggregates shall consist of natural aggregates as defined in the 2012 MDOT Standard Specifications Section 902.

The Contractor shall provide documentation that all materials to be incorporated into proposed mixed designs meet the requirements of this section.

Alkali-Silica Reactivity

The Contractor shall supply to the Engineer preliminary concrete mix designs including a list and location of all suppliers of concrete materials. The Contractor shall evaluate the mixtures for the potential for excessive expansion caused by ASR and provide documentation to the Engineer. The Contractor's evaluation shall include a review of any previous testing of the material sources intended to be used for both the fine and coarse aggregates for the concrete mixtures. The previous testing may be from other projects or records provided by the material suppliers.

Aggregates shall be tested under ASTM C-1260. If the expansion of the mortar bars is less than 0.10%, at 14 days, the aggregates shall be considered innocuous and there are no restrictions for ASR mitigation required with this material.

Previous aggregate test data may be used. If no previous test data is available, for the concrete mix, that shows that it is resistant to ASR, a concrete mixture that will mitigate the potential for ASR must be designed using either method 1 or 2 as described below.

Method 1. Substitution of a portion of the cement with Class F Fly Ash, Slag Cement Grade 100 or 120 or a ternary mix (blended cement) containing a blend of Portland cement and slag cement, or Class F fly ash, or silica fume.

The maximum substitution of cement with the fly ash permitted shall be 25% by weight of total cementitious material (cement plus fly ash). Additional requirements for the Fly Ash, Class F are that the Calcium Oxide (CaO) percent shall be less than 10 % and the available alkalis shall not exceed a maximum of 1.5%. A copy of the most recent mill test report shall be submitted to verify. Note: a Class C fly ash with a minimum total oxides ($\text{SiO}_2 + \text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3$) of 66% and a minimum SiO_2 of 38% may be used in lieu of Type F fly ash.

The maximum substitution of cement with the Slag Cement permitted shall be 40% by weight of total

cementitious material (cement plus Slag Cement). The minimum replacement rate with Slag Cement shall be 25%.

For a ternary blend the total replacement of supplementary cementitious materials is 40% with a blend consisting of a maximum of 15% type F fly ash, and/or 8% silica fume and/or slag cement.

For method 1, the effectiveness of the proposed mix combination to resist the potential for excessive expansion caused by ASR shall be demonstrated using current or historic data. To demonstrate the effectiveness of the proposed mix the Contractor shall construct and test mortar bars per ASTM C1567 (14 day test) using both the fine and coarse aggregate along with the proposed cementitious material for the concrete mixture. If a mortar bar constructed of these materials produces an expansion of less than 0.10%, concrete mixture will be considered to be resistant to excessive expansion due to ASR.

If a mortar bar constructed produces an expansion of 0.10% or greater, concrete mixtures containing these materials shall not be considered resistant to the potential for excessive expansion due to ASR and shall be rejected. Additional testing, including alternate proportions or different materials will be required.

Method 2. Use low alkali cement and maintain the total alkali content from the cementitious at no more than 3.0 lbs/cyd ($\text{Na}_2\text{O}_{\text{eq}}$). The total alkali contribution is calculated by the quantity contained in the Portland cement only.

Requirements for Low Alkali Cement are that the alkali content does not exceed 0.60% expressed as Na_2O equivalent. Equivalent sodium oxide is calculated as: (percent Na_2O + 0.658 x percent K_2O).

For either method 1 or 2, if the Contractor intends to change any component material supplied after the mix design has been approved all concrete work will be suspended with no cost to the project or extensions of time, unless approved, until evaluation of the new mixtures and testing of the new materials demonstrates that it is resistant to excessive expansion due to ASR.

The Engineer and Contractor shall monitor the concrete that is delivered to the project site so as to insure that the approved mix design is being followed. The supplier shall include on the delivery ticket for each batch of concrete delivered to the job, the identification and proportions of each material batched.

When concrete is placed during cold weather, defined for the purposes of this Detailed Specification to be, air temperatures below 40° F, the use of accelerators, heated aggregates, silica fume and/or additional forms of cold weather protection will be required. Cold weather will not eliminate the requirement for furnishing and placing a concrete mix that is considered resistant to ASR attack.

Prior to cool weather placement, defined for the purposes of this detailed specification to be, air temperatures between 40° and 60° F, the set time of the proposed mix shall be verified under anticipated field conditions. This information shall be used when scheduling pours and saw crews.

Air Entrainment

Air entrainment shall be accomplished by addition of an approved air entraining agent. Air content as determined by ASTM C 231 or ASTM C 173, shall be determined on each day of production as early and as frequently as necessary until the air content is consistently acceptable. If during the period of time while adjustments are being made to the concrete to create a mixture that is consistently acceptable, concrete is produced that does not meet the requirements of this Detailed Specification, the Engineer may reject the material and direct it to be removed from the jobsite. Any rejected material shall be removed from the jobsite at the Contractor's sole expense. Quality Control testing performed by the Contractor to ensure compliance with the project specifications shall be performed on the grade ahead of the placement operation.

Paver placement: During production, the plastic concrete material shall be tested for acceptance at a point ahead of the paver. The air content of the concrete mixture that the Contractor shall provide shall be known as the Acceptance Air Content (AAC). The Contractor shall also provide additional entrained air in the concrete mixture to account for the air loss which occurs in the concrete mixture experienced during transportation, consolidation and placement of the concrete. The "air loss" shall be added to the air content of the concrete mixture as established on the approved concrete mix design. The AAC for the project will be 6.0% plus an amount equal to the air loss.

For up to the first four loads, the air content measured on-site prior to placement shall be at least 8.0% and no more than 12.0%. To establish the initial AAC on the first day of paving, the air content of the first load shall be tested at the plant. After initial testing at the plant the Contractor shall provide at least two sample sets to determine the actual air loss during placement. A sample set shall consist of two samples of concrete from the same batch, one taken at the point of discharge and the other from the in-place concrete behind the paver. The air loss from the two sample sets shall be averaged and added to 6.0% to establish the AAC (rounded to the next higher 0.5%). After the testing and adjustment procedure(s) have been completed, the project acceptance air tests shall be taken prior to placement. The Contractor shall provide concrete to the jobsite that has an air content of plus 2.0%, or minus 1.0%, of the AAC.

After the AAC has been established, it shall be verified and/or adjusted through daily checks of the air loss through the paver. The Contractor shall check the air loss through the paver a minimum of two times a day. A Revised AAC shall be required to be established by the Contractor if the average air loss from two consecutive tests deviates by more than 0.5% from the current accepted air loss. The testing operations performed by the Contractor to establish a revised AAC shall be performed to the satisfaction of the Engineer. The Contractor shall be solely responsible for any delays and/or costs that occur to the project while establishing revised AACs.

Hand placed concrete: The air content for non-slip-form paving shall be 7.0% plus 1.5%, or minus 1.0%, at the point of placement.

CONSTRUCTION METHODS

Aggregate Control

Gradation control – The supplier shall provide a detailed stockpile management plan, describing their process control procedure for shipping, handling, and stockpiling of each aggregate including workforce training.

Moisture control – All aggregate materials must be conditioned to a moisture content of not less than saturated surface dry (SSD) prior to batching. A watering process using an effective sprinkler system designed and operated by the Contractor shall be required on all coarse aggregate material stockpiles.

The Contractor shall provide verification that these processes have been performed by the supplier. The Engineer reserves the right to independently verify that the supplier has complied with these standards.

Mixing

Central mix plants - The total volume of the batch shall not exceed the designated size of the mixer

or the rated capacity as shown on the manufacturer's rating plate.

Drum Mix Plants: After all solid materials are assembled in the mixer drum; the mixing time shall be a minimum of 60 seconds and a maximum of 5 minutes. The mixing time may be decreased if the ASTM C-94 11.3.3 mixer efficiency tests show that the concrete mixing is satisfactory. The Engineer may require an increase in the minimum mix time if the mixer efficiency test determines that the concrete is not being mixed satisfactorily. The minimum mixing time shall start after the mixer is fully charged. Mixers shall be operated at the speed recommended by the manufacturer as mixing speed. The mixer shall be charged so that a uniform blend of materials reached the mixer throughout the charging cycle. Any additional slump water required shall be added to the mixing chamber by the end of the first 25% of the specified mixing time. Mixers shall not be used if the drum is not clean or if the mixing blades are damaged or badly worn

Ribbon mixers: After all solid materials are assembled in the mixer; the mixing time shall be a minimum of 30 seconds and a maximum of 2.5 minutes. The mixing time may be decreased if the ASTM C-94 11.3.3 mixer efficiency tests show that the concrete mixing is satisfactory. The Engineer may require an increase in the minimum mix time if the mixer efficiency test determines that the concrete is not being mixed satisfactorily. The minimum mixing time shall be indicated by an accurate timing device which is automatically started when the mixer is fully charged. Mixers shall be operated at the speed recommended by the manufacturer as mixing speed. The mixer shall be charged so that a uniform blend of materials reached the mixer throughout the charging cycle. After any additional slump water is added to the mixing chamber the mixing shall continue for a minimum of 10 seconds. Mixers shall not be used if the mixer is not clean or if the mixing blades are damaged or badly worn.

Truck Mixers -The capacities and mixing capabilities shall be as defined in ASTM C 94, and each unit shall have an attached plate containing the information described therein. The plate may be issued by the Truck Mixer Manufacturer. The mixer capacity shall not be exceeded, and the mixing speeds shall be within the designated limits. Truck mixers shall be equipped with a reliable reset revolution counter. If truck mixers are used for mixing while in transit, the revolution counter shall register the number of revolutions at mixing speed.

An authorized representative of the concrete producer shall certify that the interior of the mixer drum is clean and reasonably free of hardened concrete, that the fins or paddles are not broken or worn excessively, that the other parts are in proper working order, and that the unit has been checked by the representative within the previous 30 calendar day period to substantiate this certification. The current, signed certification shall be with the unit at all times.

The required mixing shall be between 70 and 90 revolutions. The mixing shall be at the rate designated by the manufacturer and shall produce uniform, thoroughly mixed concrete.

The Engineer may inspect mixer units at any time to assure compliance with certification requirements, and removal of inspection ports may be required. Should the Engineer question the quality of mixing, the Engineer may check the slump variation within the batch. Should the slump variation between two samples taken, one after approximately 20% discharge and one after approximately 90% discharge of the batch, show a variation greater than 3/4 inch (20 mm) or 25% of the average of the two, whichever is greater, the Engineer may require the mixing to be increased, the batch size reduced, the charging procedure be modified or the unit removed from the work.

The practice of adding water on the site shall be discouraged. After the slump of the concrete in the first round of trucks has been adjusted on-site, the amount of water added at the plant shall be adjusted accordingly for that day's work. All additions of water on site shall be approved by the Engineer.

Curing

Apply liquid curing compound in a fine atomized spray to form a continuous, uniform film on the horizontal surface, vertical edges, curbs and back of curbs immediately after the surface moisture has

disappeared, but no later than 30 minutes after concrete placement. With approval of the Engineer, the timing of cure application may be adjusted due to varying weather conditions and concrete mix properties.

The cure system shall be on site and tested prior to concrete placement.

Apply a curing compound at a rate of application not less than 2 gallons per 25 square yards. The Contractor shall keep the material thoroughly mixed per the Manufacturer's recommendations. The curing compound shall not be diluted.

The finished product shall appear as a uniformly painted solid white surface. Areas exhibiting a blotchy or spotty appearance shall be recoated immediately.

COMPLIANCE WITH STANDARDS

The Engineer will review and approve all material test reports and mix designs supplied by the Contractor before any placement of concrete. The Engineer will visually inspect the placed concrete and review the concrete test reports prior to final acceptance.

Acceptance sampling and testing will be performed using the sampling method and testing option selected by the Engineer. Acceptance testing will be performed at the frequency specified by the Engineer. Quality control measures to insure job control are the responsibility of the Contractor. The Engineer's testing and/or test results will not relieve the Contractor from his/her responsibilities to produce, deliver, and place concrete that meets all project requirements. The Engineer's test results are for acceptance purposes only.

If the results of the testing are not in compliance with the project specifications, the Engineer shall determine appropriate corrective action(s). Time extensions will not be granted to the Contractor during the time that the Engineer is determining the necessary corrective actions.

If, in the Engineer's judgment, the rejected material must be replaced, the material in question will be removed and replaced at the Contractor's sole expense. The removal costs will be deemed to include all relevant and associated costs including, but not limited to; re-mobilization, traffic control, re-grading the aggregate base course, if required, placement of material meeting the project specifications, and all other expenses. Time extensions will not be granted to the Contractor for any required repair work to meet the requirements of this specification.

If the Engineer decides that the material in question can remain in place, an adjustment to the contract unit price(s) may be made of up to 100% of the bid price(s) for the affected items of work.

MEASUREMENT AND PAYMENT

The cost associated with complying with the requirements as described herein, including any required remedial action(s), shall be included in the cost of other items of work and shall not be paid for separately.

DETAILED SPECIFICATION FOR TREES AND PLANTING MATERIAL

DESCRIPTION

This work shall consist of planting trees and native plants or plugs at the locations shown on the plans, as directed by the Engineer, according to section 815, 816 and 917 of the 2012 Michigan Department of Transportation Standard Specifications, and as modified herein. Work also includes providing and placing tree drip bags and shredded bark mulch around tree plantings and providing shredded hardwood mulch where indicated on the plans.

MATERIALS

NATIVE PLUGS

- A. Plugs shall be of native plant material of genotypes from the north central states only (MI, IL, IN, IA, OH), and from a recognized nursery of this region. Michigan sources for plugs shall be located before reaching out to other north central states.
- B. Species of native plant material must be the straight species, not a cultivar, unless approved by the Engineer, or specified as a cultivar in the plant lists.
- C. Plugs shall be installed in the proportion and pattern as indicated on the drawings.

ALL PLANTINGS

- A. Material shall be of the size, genus, species, variety, cultivar and any other special designation as shown on the drawings. No substitution of species, cultivar, variety or size shall be accepted without written approval from the Engineer. Plant material shall be nursery grown, under climatic conditions similar to those in the locality of the project.
- B. Quality: Plants shall comply with the recommendations and requirements of ANSI Z60.1 "American Standard for Nursery Stock." Plants shall be healthy, vigorous stock, grown in a recognized nursery in accordance with good horticultural practice and free of disease, insects, eggs, larvae and defects such as knots, sunscald, injuries, abrasions, or disfigurement.
- C. Balled and burlapped trees shall be dug with solid balls of standard size, the balls securely wrapped with non-synthetic, untreated, biodegradable burlap, and tightly bound with non-synthetic, biodegradable rope or twine. Alternatively they may be placed in wire basket lined with non-synthetic, untreated, biodegradable burlap and tightly bound with non-synthetic, biodegradable rope or twine. Plants balled with plastic burlap will not be accepted.

TREE DRIP IRRIGATION BAGS

Tree drip irrigation bags shall be 20 gallon, slow release watering bags.

MULCH

Mulch shall be shredded hardwood mulch. Bark mulch, or colored or dyed mulch will not be accepted. For trees, mulch will be placed on the soil surface over the rootball of the tree, but not directly adjacent. Mulch should not touch tree trunk. The mulch depth is to be no less than 3" and no more than 4 inches. For all native plug planting areas shredded hardwood mulch is to be spread at a depth indicated on the plans.

STAKES

Stakes or plant locations shall be 1" X 2" X 3', and supplied by the CONTRACTOR.

TREE SUPPORT

- A. No trunk wrapping material shall remain on the tree after planting.
- B. Tree staking is not necessary unless the site is windy or the tree is greater than 3" in caliper. Any tree staking shall be approved by the ENGINEER.

1. Staking and guying materials, if approved, shall be as follows: Stakes shall be 6' to 8' long sections of unflanged metal or 2" x 2" hardwood. Support ties shall be 2-3" wide bands of polypropylene, elasticized or webbed strapping. Do not use rope or wire encased in a hose. All staking materials must be removed after one (1) year unless discussed with and authorized by the City.

SUBMITTALS

- A. The CONTRACTOR shall notify the ENGINEER of plug sources 3 (three) days after the contract award.
- B. The CONTRACTOR shall review native plug sources with the ENGINEER prior to ordering. The ENGINEER will accept or reject sources within 4 days.
- C. Upon acceptance of plug source from the ENGINEER, the CONTRACTOR shall order plugs before March 30 or within seven days of receiving the contract, whichever is sooner, and shall submit to the ENGINEER receipt of such order to ensure timely production of plugs.
- D. The CONTRACTOR shall submit an invoice following purchase and delivery of the plugs.
- E. Soil amendments: Copies of invoices shall be provided to the ENGINEER. Samples must be provided if requested by the ENGINEER.
- F. Grading and plug layout shall be reviewed by the ENGINEER prior to completion. Planting zone polygons may be laid out with spray paint prior to planting in order for ENGINEER to review.

CONSTRUCTION

The construction methods shall be in accordance with the 2012 Michigan Department of Transportation Standard Specifications for Construction Section 815.03 and 816.03 unless otherwise stated in this Detailed Specification.

PLANTING TIME

Planting for native plugs shall be done after May 1 and before June 15; or after August 31 and before October 30 or as otherwise approved by the ENGINEER.

Planting for trees shall be done, after April 1 and before June 1; or after October 1 or before December 1 or until ground freezes; or as otherwise approved by the ENGINEER.

LAYOUT

- A. Locations of plug species zones, and locations of trees and shrubs shall be established by the CONTRACTOR according to plans.
- B. Plug and perennial zones shall be laid out by paint
- C. Locations for trees and shrubs shall be identified with stakes. Different species shall be clearly labeled and marked with different color ribbon, paint or permanent marker on the stake.

Review: The CONTRACTOR shall notify the ENGINEER when staking and layout is completed and allow two working days for modifications and notice to proceed with planting.

DELIVERY, STORAGE, AND HANDLING

- A. Plant material delivery shall be the same day as planting. No plants shall be stored at the site without permission of the ENGINEER. Plants shall be carefully loaded and unloaded so as not to damage branching or root mass. Dropping of material will not be allowed. Plants in full leaf shall be thoroughly wetted down and completely covered with a wet tarp during transportation.
- B. All plant roots must be kept in a moist condition.
- C. Plant material which is poorly packed, or which arrives with the roots in a dry condition, as a result of improper packing, delay in transit, or from any other cause, will not be accepted. Stock shall be handled in such a manner that the roots shall remain intact, the branches unbroken, and the bark intact and not loosened from the wood. Stock shall be protected from drying and from temperatures below 50 degrees F and in excess of 90 degrees F prior to planting.

NATIVE PLUG AND PERENNIAL PLANTING PROCEDURE

- A. Native Plug stock as per detail:
 - 1. Remove all containers and packaging material before planting and remove from site.
 - 2. Set plants plumb.
 - 3. Do not damage root structure.
 - 4. Thoroughly soak root matter with water.
 - 5. See the Watering and Cultivating section of these specifications for watering during the Establishment Period.
- B. In areas where both plugs and erosion control blanket are present, plugs shall be planted through the blanket after its installation.
- C. The CONTRACTOR shall be responsible to keep the plugs adequately watered, if necessary, to ensure their survival.

TREE PLANTING PROCEDURE

- A. Plant as per MDOT 815.03.F
- B. The shredded hardwood mulch shall be applied to a depth of 3” on 6” of topsoil.
- C. Attach Tree Drip Irrigation Bag per manufacturer’s instructions and fill with water.
- D. The Contractor shall be responsible to keep the plants adequately watered during the guarantee period, if necessary, to ensure their survival.

MEASUREMENT AND PAYMENT

The completed work, as described herein, will be measured and paid for using applicable planting pay items as detailed on the Plan or by the Engineer.

Measurement and payment for the above items shall include excavation and removal of materials, furnishing trees, shrubs and herbaceous material, preparing soil, mulch, bracing/staking materials, irrigation drip bags, water, and all other equipment necessary, and as described herein, for a complete installation.

Mulch shall include payment for all labor, equipment and materials necessary for supplying and placing a shredded hardwood mulch where indicated on the plans and shall be included in all applicable planting pay items.

The final inspection of all planting work under the Contract will be made by the Contractor and Engineer at the end of the maintenance and establishment periods. Before final acceptance is given, the terms of the establishment shall be met and the site shall be cleared of all debris, soil piles and containers.

**ETAILED SPECIFICATION
FOR
ITEM #211 - REMOVE AND REPLACE 4 OR 6 INCH SANITARY SEWER
LEAD**

DESCRIPTION

This work shall consist of removing and replacing existing sanitary lead pipe in new utility trenches as directed by engineer when conflicts with new utilities are identified or when the condition of the existing pipe prevents proper utility protection. Work includes cutting lead, carefully removing, replacing with SDR 35 PVC pipe and fittings along with Fernco connections. All materials need to accomplish this work is included in this pay item. All work shall be done in accordance with the City of Ann Arbor Public Services Department Standard Specifications, and as directed by the Engineer.

CONSTRUCTION METHODS

The Construction Methods shall meet all requirements of the City of Ann Arbor Standard Specifications.

Sewer leads are private and no official City records are kept. Approximate locations of leads have been placed on plans per survey data when available. Contractor to carefully excavate leads, not dig through lead but to saw cut out of way. Lead to be kept clean, have positive fall, and replaced as soon as possible. Contractor to coordinate with homeowner as needed to complete work. Trench must be carefully backfilled to prevent damage. Prior to placement of HMA contractor will have entire lead televised to verify condition of repaired sections and to verify sufficient slope has been provided. Any defects in the repaired sections shall be exposed and repaired at contractor's expense.

MEASUREMENT AND PAYMENT

The unit price for the pay item "Remove and Replace 4 of 6 inch Sanitary Sewer Lead" includes all labor, material and equipment costs associated with the complete installation of the sewer lead, as specified herein, including but not limited to, excavation MDOT CL II backfill, compaction.

Payment shall include all labor, equipment, and materials necessary to remove and store the existing sewer lead as directed by the Engineer.

The unit prices for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

PAY ITEM

Remove and Replace 4 or 6 inch Sanitary Sewer Lead

PAY UNIT

LF

**DETAILED SPECIFICATION
FOR
ITEM #215 – SEWER CLEANING AND VIDEO INSPECTION, 36 INCH
ITEM #216 – SEWER CLEANING AND VIDEO INSPECTION, 42 INCH
ITEM #217 – MANHOLE CLEANING AND VIDEO INSPECTION**

DESCRIPTION

This work shall consist of the cleaning and video inspection of sewer pipes and manholes, performing bypass pumping on sanitary sewers to facilitate proper cleaning and video inspection of the sewer and/or manholes, and providing the required documentation as described herein. All work shall be performed in accordance with the City of Ann Arbor Standard Specifications, except as modified herein, and as directed by the Engineer.

BYPASS PUMPING

The Contractor shall maintain flow in the existing sanitary sewer at all times by bypass pumping, as necessary. During wet weather events, the flow in the sanitary sewer will rise rapidly and may become surcharged. Equipment used shall be sufficient to handle anticipated peak flows. The minimum pump size used shall be 400 gpm. Pump noise shall be kept at or below 40 decibels at 100 feet from the source. The Contractor shall maintain flow in such a manner as the existing flow can be adequately transported, including wet weather flow.

The Contractor shall submit a detailed bypass pumping management plan to be reviewed and approved by the Engineer, prior to any obstruction of flows in the sanitary sewer. The Contractor shall plan his operation such that there will be no backups, leaks or discharges of sewerage. The Contractor shall be completely responsible for all clean-up of backups, leaks or discharges of sewerage.

The Contractor shall also furnish and have available on-site; redundant pumping facilities in case of any failure of the pumping system including pumps, piping, electrical equipment, pipe appurtenances, etc. Redundant pumping facilities also include having a backup power generator in case the primary power source fails. The Contractor shall provide an adequate labor force to oversee the bypass pumping including providing labor to maintain 24 hour per day operation and emergency backup service, if necessary. The Contractor will not be able to obstruct flows in the sewer unless the primary and redundant equipment is on-site and in operable condition.

If, at any time during construction, effluent from the existing sewer is not fully contained by the bypass system, gravity service will be restored and work shall be suspended until the problem is resolved to the satisfaction of the Engineer.

All costs for pumping and by-passing flow shall be considered incidental to the Cleaning and Video Inspection pay items.

CLEANING

Each sewer section and manhole shall be cleaned to a degree sufficient to allow video inspection and CIPP lining to be completed in accordance with this specification. The Contractor shall take precautions to protect the sewer pipe and manholes from damage.

All water necessary for the cleaning operations shall be furnished by the City at agreed fire hydrant locations. Contact the Wheeler Center: located at 4251 Stone School Road at 734-994-1760 for procedures and fees for the hydrant meter, backflow preventer, and hydrant meter cage. Fees shall be paid by Contractor. Hydrants used by the Contractor shall be pumped down by the Contractor to prevent freezing. Frozen hydrants that were used by the Contractor and not properly closed or pumped down shall be repaired by the Contractor at no additional cost.

The Contractor must adhere to the requirements of ASTM F1216 or ASTM F1606 for following types of cleaning: hydraulic cleaning, high velocity hydro-cleaning, and mechanical cleaning. The sewers shall be cleaned by using a high pressure water cleaning machine. A high pressure hose with a jet nozzle shall be introduced into the sewer so that a spray shall scour and clean the sewer line without applying internal pressure and damaging the pipe. The hose shall be self propelled by a minimum water pressure of 1,000 psi. The jet nozzle hose, upon withdrawal, will scour the pipe, flushing light materials down the line and depositing heavy materials in the downstream manhole for removal.

Remove dirt, grease, rocks, sand, roots, and other deleterious materials and obstructions from the sewer line and manholes. If the Contractor is unable to complete cleaning from one manhole downstream to the next manhole, then they shall re-setup on the downstream manhole and attempt to clean upstream. For major blockages where cleaning cannot be completed, notify the Engineer before proceeding.

The Contractor shall clean each sewer manhole to be lined and shall dispose of any resulting material. The cleaning shall be performed using a high power jet wash at a minimum of 3500 psi water pressure to remove all dust biological growths, grease, oil, paint or any other surface contaminants or coatings. Coatings that cannot be removed shall be sanded with coarse sand paper to rough the surface sufficient to obtain and insure adequate bonding of the cementitious lining.

Roots shall be removed by manually cutting the roots from inside the manhole. Mechanical root cutting shall be performed with powered equipment. Remove any root masses that prevent passage of television inspection equipment. Mechanical root cutting shall not be paid for separately and is included in the price for the pay for "Sewer Cleaning and Video Inspection, ___ inch" or "Manhole Cleaning and Video Inspection", whichever is appropriate.

Material removal shall be performed at the first downstream manhole. At no time during cleaning shall material be allowed to enter the sewer at the downstream manhole. Material removed shall be disposed of by the Contractor at an approved facility and shall not be paid for separately. No debris shall be accumulated on site unless approved by the Engineer. When removing waste, the material shall be decanted to remove as much of the liquid as possible.

Acceptance of the cleaning portion of the work shall be dependent upon the results of the video inspection. Lines not acceptably clean as to permit video inspection or the subsequent lining installation shall be re-cleaned, re-inspected and re-submitted to the Engineer for review at the Contractor's expense.

VIDEO INSPECTION

After the sewers and manholes are completely cleaned, they shall be inspected via closed circuit television (CCTV).

All work submitted by the Contractor shall be completed by PACP Certified professionals. A current PACP certification number shall be included for each person creating/gathering inspection reports or performing video inspections.

The purposes of the CCTV inspections are to verify that the sewers and manholes have been thoroughly cleaned, to document the condition of the existing sewers and the locations of service connections, to locate sewer defects requiring repair prior to lining, and to confirm that the lining can be properly installed and cured. The Contractor shall use extreme caution during all cleaning and television inspection work, as the manholes and sewer pipes are old and may be in poor structural condition.

Video inspections shall be conducted within 48 hours of cleaning.

The camera equipment used for the CCTV inspections shall be one specifically designed and constructed for such inspection. Camera must be operative in 100% humidity conditions. The live image obtained by the camera shall be transmitted to a color monitor of not less than 19 inches. Camera and monitor shall have a minimum 500 line resolution. The monitor shall be located inside the mobile recording studio.

All cameras shall move through the main sewers via self-powered tractor assemblies — no skid assemblies shall be permitted. The tractor assemblies used for the inspections shall be the appropriate size assembly for the pipe being televised according to the manufacturer of the television equipment.

Lighting for the camera shall be adequate to allow a clear picture of the entire periphery of the sewer and shall be varied as required to be effective for all pipe diameters inspected. Remote control of lighting brilliance, camera focus, and camera movement shall be from a control panel inside the mobile recording studio. Cables and equipment used to propel the camera shall not obstruct the camera view or interfere with the documentation of the sewer conditions.

Camera shall be moved through sewer line at a uniform rate, maximum 30 feet per minute. The camera shall be stopped at major defects and service connections and shall be panned, tilted and rotated to fully view the defects and connections. All such inspections shall be documented on computer-generated logs. Particular attention should be paid to service connections and whether the services are active or plugged. Whenever possible the camera shall move in a downstream direction.

The inspections shall be complete from manhole to manhole without the need for reverse setups unless approved otherwise by the Engineer. If, during the work, the CCTV inspection is blocked by debris, a protruding lateral or sewer system defect, the Contractor shall remove the blockage or repair the defect as authorized by the Engineer and then continue the inspection.

The inspections shall begin at the center of the manhole, shall clearly show the pipe connection of the sewer to be inspected at the manhole and shall pan and tilt around the manhole to provide a clear view of the manhole and all pipe connections. At every downstream manhole, the camera shall be panned and tilted within the manhole to provide a clear view of the manhole and all pipe connections.

The accuracy of the measurements cannot be stressed too strongly. Daily calibration of measuring devices shall be performed. Sewer lengths shown and reported on the CCTV inspection tapes and logs shall be within 3 feet (plus or minus) of the actual sewer length as measured above ground from center of manhole to center of manhole. CCTV inspections that do not meet these criteria shall be re-performed and re-submitted to the Engineer at no additional cost to the City of Ann Arbor.

The maximum flow depth for CCTV inspection work is 25% of the pipe diameter or as approved by the Engineer. The Contractor may be required to perform inspections during off-peak hours (night inspections) if specifically requested by the Engineer to achieve this maximum flow standard.

Documentation

All televised sewer inspections performed (including sewer laterals) shall be submitted to the Engineer in electronic (digital) format.

The contractor shall use the City's manhole numbering system on all documentation, which shall be provided by the City.

The Contractor shall provide the City inspection logs listing the location in relation to adjacent manholes of each infiltration point, service leads, unusual conditions, roots, storm sewer connections, collapsed sections, presence of scale and corrosion, cracked pipe, wide joints and other discernible features. The logs shall indicate size and type of pipe material, length of line from manhole and direction of sewage flow, if present. The logs shall also indicate the time and date of recording.

The digital recording shall include both audio and video information that accurately reproduces the original picture and sound of the video inspection. The video portion of the digital recording shall be free of electrical interference and shall produce a clear and stable image. The audio portion shall be sufficiently free of background and electrical noise as to produce an oral report that is clear and discernible.

Video Overlay:

The video shall include overlay/text display with an initial display screen and with a continuous running screen. Each inspection start shall include overlay display of section details including at a minimum:

1. Date/Time of Inspection
2. MH Start (City manhole identification number)
3. MH End (City manhole identification number)
4. Pipe Material
5. Pipe Size
6. Direction of Video
7. Flow Level

The continuous running screen shall include a constant display of the MH start #/MH End #, date and distance shall appear on screen. The CCTV inspector shall move or remove overlay display accordingly so it does not interfere with the inspection review of particular observations/defects as the inspection is occurring.

Distance shall appear continuously in the lower right corner of the video image as the camera is traveling down the line.

It is imperative that distance is accurate. The CCTV inspector shall calibrate/test footage at the beginning of each day as incorrect footage will result in return of inspections.

The Contractor shall provide color photographs of sewer laterals and all problem areas.

Video Media:

The database file and the corresponding video files shall be submitted to the Engineer on DVD, flash drive or portable external hard drives. One copy of the printed logs (in color) that correspond to the inspections shall be submitted to the Engineer. The Engineer will return the hard drive to the Contractor after the inspections have been reviewed.

Each submittal to the Engineer shall include a transmittal letter, listing the file names and all sewer segments and video files included on the hard drive.

MEASUREMENT AND PAYMENT

Payment shall be made on a per linear foot basis for cleaning and televising of sewer. Measurements shall be from manhole to manhole, and shall take place with both the Engineer and the Contractor (or their agents) present. Payment shall be per manhole cleaned and video inspected.

Measurements shall be recorded and logged on a daily basis.

The completed work as measured for these items of work will be paid at the unit prices for the following pay items:

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Sewer Cleaning and Video Inspection, 32 inch	Linear Foot
Sewer Cleaning and Video Inspection, 42 inch	Linear Foot
Manhole Cleaning and Video Inspection	Each

The unit prices for these pay items shall be payment in full for all labor, material, and equipment required for the work including, but not limited to: all video inspection, cleaning; removal of roots, mineral deposits, mud, and debris; gaining access to work site; removal and replacement of site improvements; and all other items necessary to complete the job, whether specifically mentioned or implied.

**DETAILED SPECIFICATION
FOR
ITEM #220 – SEWER PRELINING, 36 INCH
ITEM #221 – SEWER PRELINING, 42 INCH
ITEM #222 – SEWER LINING, CIPP, 36 INCH
ITEM #223 – SEWER LINING, CIPP, 42 INCH**

DESCRIPTION

This work shall consist of rehabilitating pipelines by the insertion of a resin impregnated flexible lining and cured in place to form a pipe. The cured in place pipe (CIPP) shall be saturated with a thermosetting resin and inserted into the existing pipeline. Curing shall be accomplished by circulating hot water, heated air, or ambient cure, to harden the resin into a hard impermeable pipe. When cured, the hardened CIPP shall be a tight fitting watertight pipe within a pipe. When full length liners are specified, the CIPP shall be continuous from manhole to manhole with no circumferential joints or seams. Except as otherwise specified herein, all work shall be performed in accordance with the City of Ann Arbor Public Services Area Standard Specifications, and as directed by the Engineer.

MATERIALS

General

When cured, the CIPP shall form a continuous, tight-fitting, hard, impermeable liner, which is chemically resistant to any chemicals normally found in domestic sewage. The liner shall be chemically resistant to trace amounts of gasoline and other oil products commonly found in municipal sewerage and soils adjacent to the sewer pipe to be lined.

The CIPP shall be fabricated to a size that will tightly fit the sewer being rehabilitated after being installed and cured. The liner shall be capable of fitting into irregularly shaped pipe sections and through bends and dips within the pipeline. Allowance for longitudinal and circumferential expansion shall be taken into account when sizing and installing the liner. All dimensions shall be verified in the field by the Contractor, prior to fabrication of the liner. Field measurements shall be used to ensure maximum closure between the new liner and the existing sewer pipe. There shall be no leakage of groundwater between the existing pipe and the CIPP at the manhole connection or service lateral connections. Any leakage found shall be eliminated by the Contractor at no additional cost to the City. The finished liner shall be designed per ASTM F 1216 Appendix X1; per the requirements of this specification, for the following condition:

Safety Factor:	2
Soil Density:	130 lbs/cft
Soil Modulus:	700 psi for pipe inverts up to and including 15 feet deep, 1,000 psi for pipe inverts greater than 15 feet deep
Surcharge Loading:	HS-20 (Highway) when any part of the sewer is under any major street, county road, or state highway; E-80 (Railroad) when under any railroad.

The acceptable resin system values to be incorporated into the formula for liner thickness shall not be greater than the following.

	<u>Polyester</u>	<u>Enhanced Polyester</u>	<u>Vinyl Ester</u>	<u>Epoxy</u>
Short Term Flexural Modulus	300,000	400,000	250,000	300,000
Long Term Flexural Modulus	150,000	200,000	125,000	150,000
Creep Retention Factor	50%	50%	50%	50%
Flexural Strength	4,500	4,500	4,500	5,000

Where the requirements of this specification conflict with ASTM F 1216 or ASTM D 5813 this specification shall govern.

Cured-in-place pipe (CIPP) lining shall be one of the following products or an approved equal:

- Invert-A-Pipe by Improved Technologies Group
- National Liner by National EnviroTech Group, LLC
- In liner by Inliner Technologies, Inc.
- Insituform by Insituform Technologies, Inc.
- Diamond Lining Systems by Daystar Composites LLC
- Premier-Pipe USA by J.W.M. Environmental, Inc.

The Contractor shall submit complete shop drawings of CIPP to demonstrate compliance with these specifications, to show materials of construction (including resins, catalysts, etc.) and to detail installation procedures. Installation procedures shall include acceptable inversion heads and pressures, heating (i.e., cooking) and cool-down procedures and temperatures, times for each stage of the process, and cure logs for the resin/resin system used. The Contractor shall provide this information without delay or claim to any confidentiality. Testing procedures and quality control procedures shall also be submitted.

Certifications that the CIPP was manufactured in accordance with these specifications and the appropriate ASTM standards shall be submitted with each shipment.

Preliner Tube

The Preliner shall be a polyethylene pre-liner compatible with the lining system, and shall be utilized where necessary to accommodate infiltration or missing pipe. The preliner shall be used from manhole to manhole at locations identified by the Engineer after the video inspections have been reviewed.

Felt Liner Tube

The liner shall be composed of tubing material consisting of one or more layers of a flexible non-woven polyester felt with or without other additives such as fiberglass or other reinforcing additives. The felt tubing shall be impregnated with a thermosetting isothalic polyester resin and catalyst or vinyl ester and catalyst. The liner material and resin shall be completely compatible. The inside and/or outside layer of the tube shall be coated with an impermeable material compatible with the resin and fabric. The liner shall cure in the presence of water or steam at the required temperature for the resin system.

The outer Tube coating shall consist of a translucent elastomer that allows for visual inspection and verification of proper resin impregnation. The plastic coating shall hold the resin inside the Tube without leakage, accommodate installation, and stretch to the size and shape of the existing sewer, and shall not delaminate before, during, or after curing. The outside of the Tube shall be marked for distance at regular intervals along its entire length, not to exceed five (5) feet. Such markings shall include the manufacturers name or identifying symbol.

The Tube shall have a uniform thickness that when compressed at installation pressures will meet or exceed the design thickness.

The felt material shall be manufactured by companies specializing in felt production for CIPP. The manufacturer shall have manufactured felt material for CIPP for at least 2 years as documented by references. The felt manufacturer, references and location of the manufacturing facility shall be submitted to the Engineer for review and approval. The felt material manufacturer and facility shall not change during construction unless specifically approved by the Engineer in writing.

The length of the Tube shall be that deemed necessary by the Contractor to effectively carry out the insertion and seal the pipe at the inlet and outlet points. The Contractor shall verify the lengths in the field before cutting the Tube to length. Lengths of sewer can be lined over one or more access points as determined in the field by the Contractor and approved by the Engineer.

Resin

The polyester or vinyl ester resin shall be PREMIUM, NON-RECYCLED resin only. Polyethylene Terephthalate (PET) resins, or those containing fillers, additives or enhancement agents shall not be used. The resin manufacturer shall not include any old resin or rework in the product shipped to the wet-out facility (i.e., where the liner is impregnated with the resin). The resin shall be manufactured under ISO 9002 certified procedures. Such certification shall be submitted to the Engineer for each shipment of resin to the wet-out facility. The proposed resin shall equal or exceed the published properties of Reichhold PolyLite 33420 resin (for isothalic polyester resin) or Reichhold Atlac 580-20 (for vinyl ester resin).

The exact makeup of the resin shall be submitted to the Engineer including chemical resistance information, cure logs and temperatures. Polyester resins shall have a minimum Heat Distortion Temperature of 212°F per ASTM D648. Vinyl ester resins shall have a minimum Heat Distortion Temperature of 220°F per ASTM D648.

The exact mixture ratio of resin and catalyst shall also be submitted. The catalyst system shall be identified by product name. The resin/catalyst ratio shall be approved by the resin manufacturer in writing. The catalyst system shall be made up of a primary catalyst and a secondary catalyst. The primary catalyst shall be Akzo Perkadox 16 or approved equal and shall be added at a maximum of 1% of the resin volume by weight unless otherwise approved by the Engineer. The secondary catalyst shall be Akzo Trigonox or approved equal and shall be added at a maximum of 0.5% of the resin volume by weight unless otherwise approved by the Engineer. The resin/catalyst system shall be formulated so that the CIPP will cure as specified below. Quick-cure or accelerated resin systems that cure in half the specified time or substantially quicker than the minimum 3 hours specified below will not be allowed. Quick-cure resin systems include those formulated by substantially increasing the amount of catalysts from that specified above. Resins, catalysts and resin/catalysts mixing ratios shall not be changed during this Contract unless specifically approved by the Engineer in writing.

The cure schedules for the CIPP shall be submitted to the Engineer for review. The curing process/schedules shall be approved by the resin manufacturer in writing. The cure schedules shall include specific information on stepping the temperature up to "cooking" temperatures, "cooking" temperatures and durations, and cool-down procedures — all to be approved in writing by the resin manufacturer.

When requested by the City, the Contractor shall submit test results from previous field installations of the same resin system and tube materials as proposed for this installation. The test results must verify that the CIPP physical properties specified in this Section have been achieved in the field.

The Contractor shall determine the liner thickness and resin quantity for this Project per ASTM F 1216, Appendix X1. Liner thickness, resin and resin quantity shall be furnished to Engineer for review and approval prior to beginning work. The CIPP wall thickness shall be calculated from the equation in ASTM F 1216, Appendix X1, based upon the parameters given in this Section. The minimum CIPP wall thickness shall be not less than the value calculated by that equation. Any layers of tube that are not saturated with resin and totally cured shall not be included in the CIPP wall thickness.

The Contractor shall submit his proposed plan for ensuring that the installed CIPP meets the above minimum thickness requirements. The plan shall include the proposed CIPP thickness to be installed (pre-installation thickness) and detailed inversion or pull-in procedures to reduce stretching and to reduce migration of resin.

QUALIFICATIONS

The Contractor performing the CIPP lining work shall be fully qualified, experienced and equipped to complete this work expeditiously and in a satisfactory manner and shall be certified and/or licensed as an installer by the CIPP manufacturer. The Contractor shall have installed a minimum of 300,000 feet of CIPP for a minimum of five years. The full-time, on-site superintendent/foreman that will supervise the CIPP installation shall have installed at least 150,000 feet of a cured-in-place pipe lining system for a minimum of two years. The total footage claimed shall be supported by references. The Contractor shall submit information to document his experience and the experience of the proposed superintendent/foreman.

DELIVERY, STORAGE AND SHIPPING

Care shall be taken in shipping, handling and laying to avoid damaging the preliner and/or the CIPP liner. Extra care shall be taken during cold weather construction. Any preliner or liner damaged in shipment shall be replaced as directed by the Engineer. Any liner showing a split or tear or has been mishandled shall be marked as rejected and removed at once from the work site. The liner shall be maintained at a proper temperature in refrigerated facilities to prevent premature curing at all times prior to installation. Any liner showing evidence of premature curing will be rejected for use and will be removed from the work site immediately.

CONSTRUCTION METHODS

The Contractor shall carry out his operations in strict accordance with all OSHA, MIOSHA, and manufacturer's safety requirements.

All water necessary for the lining operations shall be furnished by the City at agreed fire hydrant locations. Contact the Wheeler Center: located at 4251 Stone School Road at 734-994-1760 for procedures and fees for the hydrant meter, backflow preventer, and hydrant meter cage. Fees shall be paid by Contractor. Hydrants used by the Contractor shall be pumped down by the Contractor to prevent freezing. Frozen hydrants that were used by the Contractor and not properly closed or pumped down shall be repaired by the Contractor at no additional cost.

The Contractor is responsible for videotaping and cleaning the pipe prior to lining operations in accordance with the Detailed Specifications for Sewer Cleaning and Video Inspection. The Contractor shall review the video inspections with the Engineer and determine if a preliner is to be installed prior to the CIPP liner. In addition, if the video inspection reveals conditions in the sewer are such that spot repairs will be required, the Contractor and Engineer will identify these areas and agree as to how the repairs shall be conducted. Required items for spot repair will be paid separately.

Bypass Pumping

The Contractor shall maintain flow in the existing sanitary sewer at all times by bypass pumping, as necessary. During wet weather events, the flow in the sanitary sewer will rise rapidly and may become

surcharged. Equipment used shall be sufficient to handle anticipated peak flows. The minimum pump size used shall be 400 gpm. Pump noise shall be kept at or below 40 decibels at 100 feet from the source. The Contractor shall maintain flow in such a manner as the existing flow can be adequately transported, including wet weather flow.

The Contractor shall submit a detailed bypass pumping management plan to be reviewed and approved by the Engineer, prior to any obstruction of flows in the sanitary sewer. The Contractor shall plan his operation such that there will be no backups, leaks or discharges of sewerage. The Contractor shall be completely responsible for all clean-up of backups, leaks or discharges of sewerage.

The Contractor shall also furnish and have available on-site; redundant pumping facilities in case of any failure of the pumping system including pumps, piping, electrical equipment, pipe appurtenances, etc. Redundant pumping facilities also include having a backup power generator in case the primary power source fails. The Contractor shall provide an adequate labor force to oversee the bypass pumping including providing labor to maintain 24 hour per day operation and emergency backup service, if necessary. The Contractor will not be able to obstruct flows in the sewer unless the primary and redundant equipment is on-site and in operable condition.

If, at any time during construction, effluent from the existing sewer is not fully contained by the bypass system, gravity service will be restored and work shall be suspended until the problem is resolved to the satisfaction of the Engineer.

All costs for pumping and by-passing flow shall not be paid for separately and shall be included in the unit price for the pay items for "Sewer Lining, CIPP, ___inch".

Notification

The Contractor shall notify all property owners that will be affected by the work **72 hours** in advance of the work, giving the date, start time and estimated completion time for the work being conducted and the expected impacts to the property owner. Notification shall be by means of a written notice on City letterhead or door hanger, delivered to each user and shall advise users to minimize water usage during this period. The City shall supply the notices. The Contractor shall ensure that every user is so notified. Notification shall include telephone number(s) for contacting the Contractor at any time, day or night.

Line Obstructions

It shall be the responsibility of the Contractor to clear the line of obstructions such as solids, dropped joints, protruding branch connections or broken pipe that will prevent proper insertion of the liner. If the pre-design video inspection reveals an obstruction that cannot be removed by conventional cleaning equipment, then the obstruction shall be removed by equipment operating within the pipeline.

Services which protrude more than 3/4 inch into the sewer lines shall be ground down as flush as possible with the wall of the sanitary sewer wall prior to installing the preliner and/or liner. Grinding shall be done with equipment operating inside of the sewer and shall not cause damage to the sewer or the service being ground. Grinding shall not be paid for separately, but is incidental to the cost of the pay items for "Sewer Lining, CIPP, ___ inch".

If the protruding service is in such condition that grinding is not possible or if the condition of the sewer is such that repairs cannot be performed from inside the sewer then the Contractor shall make a spot repair excavation, to uncover and remove or repair the obstruction. Such excavation shall be approved in writing by the Engineer prior to the commencement of the work and shall be paid for separately.

Installation of Resin Impregnated Tube

The Contractor shall designate a location where the uncured resin in the original containers and the unimpregnated liner will be resin impregnated prior to installation. The Contractor shall allow the Engineer (or a designated representative) to inspect the materials and procedure. A resin and catalyst system compatible with the requirement of this section shall be used. The quantities of the liquid thermosetting materials shall be provided in accordance with manufacturer's standards to provide the cured liner properties specified. Sufficient resin shall be used to fill the volume of air voids in the liner with additional allowance for polymerization, shrinkage and loss of resin through cracks and irregularities in host pipe wall. The Contractor shall ensure that the proper amount of resin is uniformly distributed throughout the entire length of the Tube.

The wetting out, installation, and curing of the resin impregnated Tube shall be in accordance with ASTM F 1216. The Tube shall be inserted through an existing manhole or other approved access by means of an inversion process, the application of a hydrostatic head sufficient to fully extend the liner to the next designated access point, or any other means approved by the Engineer.

The process will be adjusted as necessary to ensure a complete lining without over stressing or tearing the lining; and with sufficient pressure to hold the liner snug to the pipe wall and to produce dimples at side connections and flared ends at the entrance and exit access points. The use of a lubricant is recommended and if used, such lubricant shall be compatible with the rehabilitation process.

The manufacturer's standards shall be closely followed during the elevated curing temperature so as not to over stress the felt fiber and cause damage or failure of the liner prior to cure.

Curing

Hot water or heat cured liners are required for full length liners. Ambient cure liners may be used for spot repair liners. After installation of the resin impregnated liner is completed, the Contractor shall supply a suitable heat source and water recirculation equipment when necessary to cure the liner. The equipment shall be capable of delivering hot water to the far end of the liner through a hose, which has been perforated per manufacturer's recommendations, to uniformly raise the water temperature in the entire pipe above the temperature required to affect a cure of the resin. This temperature shall be determined by the resin/catalyst system employed.

The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing circulating water/air. Thermocouples shall be placed between the Tube and existing pipe at the access points to determine the temperature of the cure. Temperature in the line during the cure period shall be not less than 150°F or more than 200°F as measured at the heat exchanger return line.

Initial cure shall be deemed to be completed, when inspection of the exposed portions of the liner appears to be hard and sound and the thermocouples indicate that an exothermic reaction has occurred. The cure period shall be of a duration recommended by the resin manufacturer, as modified for the lining process, during which time the recirculation of the water/air and cycling of the heat exchanger to maintain the temperature in the liner continues.

Cool-Down

The Contractor shall cool the CIPP to a temperature below 100°F before relieving the static head in the liner. Cool-down may be accomplished by the introduction of cool water into the liner to replace water being drained from the downstream end. Care shall be taken in the release of the static head such that a vacuum will not be developed that could damage the newly installed liner.

Finish

The cured liner shall be continuous over the entire length of an insertion run and be as free as commercially practicable from visual defects such as foreign inclusions, dry spots, pinholes and delamination. The lining shall be impervious and free of any leakage.

Any defects, which will affect the integrity of the liner, or any deficiencies in required strengths or thicknesses, shall be repaired or removed and replaced at the Contractor's expense, in a manner acceptable to the Engineer.

Sealing Liner at the Ends

If due to broken or misaligned pipe at the access point, the lining fails to make a tight seal, the Contractor shall apply a seal at that point. The seal shall be of a resin mixture compatible with the installed liner.

Branch or Service Connections

The Contractor shall fully reopen all of the existing active service connections in each length of sewer following lining. The service connections shall be reopened from inside the sewer by means of a CCTV camera controlled cutting device appropriate for the CIPP. All openings shall be clean and neatly cut and shall be flush with the lateral pipe. The openings shall also be buffed with a wire brush to remove rough edges and provide a smooth finish. The bottom of the openings shall be flush with the bottom of the lateral pipe to remove any lip that could catch debris. Openings shall be 100% of the service lateral pipe. The Contractor shall re-open any service lateral that does not meet this requirement as evidenced by the post-rehabilitation inspections at no additional cost.

The Contractor shall be fully responsible for all backups and damage caused by not fully opening a lateral connection, including paying all costs associated with repairing damage as required by the Engineer, the City of Ann Arbor and/or property owner.

Reconnection of services shall begin immediately after curing of the CIPP has been completed. No service shall be interrupted for more than 12 hours unless otherwise approved by the Engineer.

INSPECTION AND TESTING

Post-Rehabilitation Video Inspection

After the sewers are completely lined, the Contractor shall inspect all lined sewers via closed circuit television (CCTV).

All work submitted by the Contractor shall be completed by PACP Certified professionals. A current PACP certification number shall be included for each person creating/gathering inspection reports or performing video inspections.

The purposes of the CCTV inspections are to confirm that the lining has been properly installed and cured.

The camera equipment used for the CCTV inspections shall be one specifically designed and constructed for such inspection. Camera must be operative in 100% humidity conditions. The live image obtained by the camera shall be transmitted to a color monitor of not less than 19 inches. Camera and monitor shall have a minimum 500 line resolution. The monitor shall be located inside the mobile recording studio. All cameras shall move through the main sewers via self-powered tractor assemblies — no skid assemblies shall be permitted. The tractor assemblies used for the inspections shall be the appropriate size assembly for the pipe being televised according to the manufacturer of the television equipment.

Lighting for the camera shall be adequate to allow a clear picture of the entire periphery of the sewer and shall be varied as required to be effective for all pipe diameters inspected. Remote control of lighting

brilliance, camera focus, and camera movement shall be from a control panel inside the mobile recording studio. Cables and equipment used to propel the camera shall not obstruct the camera view or interfere with the documentation of the sewer conditions.

Camera shall be moved through sewer lines at a uniform rate, maximum 30 feet per minute. The camera shall be stopped at service connections and shall be panned, tilted and rotated to fully view the connections. All such inspections shall be documented on computer-generated logs. Particular attention should be paid to service connections and whether the services are active or plugged. Whenever possible the camera shall move in a downstream direction.

The inspections shall be complete from manhole to manhole without the need for reverse setups unless approved otherwise by the Engineer.

The inspections shall begin at the center of the manhole, shall clearly show the pipe connection of the sewer to be inspected at the manhole and shall pan and tilt around the manhole to provide a clear view of the manhole and all pipe connections. At every downstream manhole, the camera shall be panned and tilted within the manhole to provide a clear view of the manhole and all pipe connections.

The accuracy of the measurements cannot be stressed too strongly. Daily calibration of measuring devices shall be performed. Sewer lengths shown and reported on the CCTV inspection tapes and logs shall be within 3 feet (plus or minus) of the actual sewer length as measured above ground from center of manhole to center of manhole. CCTV inspections that do not meet this criteria shall be re-performed and re-submitted to the Engineer at no additional cost to the City.

The maximum flow depth for CCTV inspection work is 25% of the pipe diameter or as approved by the Engineer. The Contractor may be required to perform inspections during off-peak hours (night inspections) if specifically requested by the Engineer to achieve this maximum flow standard.

Documentation

All post rehabilitation televised sewer inspections performed (including sewer laterals) shall be submitted to the Engineer in electronic (digital) format.

The contractor shall use the City's manhole numbering system on all documentation, which shall be provided by the City.

The Contractor shall provide the City inspection logs listing the location in relation to adjacent manholes and other discernible features. The logs shall indicate size and type of pipe material, length of line from manhole and direction of sewage flow, if present. The logs shall also indicate the time and date of recording.

The digital recording shall include both audio and video information that accurately reproduces the original picture and sound of the video inspection. The video portion of the digital recording shall be free of electrical interference and shall produce a clear and stable image. The audio portion shall be sufficiently free of background and electrical noise as to produce an oral report that is clear and discernible.

Video Overlay:

The video shall include overlay/text display with an initial display screen and with a continuous running screen. Each inspection start shall include overlay display of section details including at a minimum:

1. Date/Time of Inspection
2. MH Start (City manhole identification number)

3. MH End (City manhole identification number)
4. Pipe Material
5. Pipe Size
6. Direction of Video
7. Flow Level

The continuous running screen shall include a constant display of the MH start #/MH End #, date and distance shall appear on screen. The CCTV inspector shall move or remove overlay display accordingly so it does not interfere with the inspection review of particular observations/defects as the inspection is occurring.

Distance shall appear continuously in the lower right corner of the video image as the camera is traveling down the line.

It is imperative that distance is accurate. The CCTV inspector shall calibrate/test footage at the beginning of each day as incorrect footage will result in return of inspections.

Video Media:

The database file and the corresponding video files shall be submitted to the Engineer on DVD, flash drive or portable external hard drives. One copy of the printed logs (in color) that correspond to the inspections shall be submitted to the Engineer. The Engineer will return the hard drive to the Contractor after the inspections have been reviewed.

Each submittal to the Engineer shall include a transmittal letter, listing the file names and all sewer segments and video files included on the hard drive.

CIPP Pipe Testing

Testing in accordance with ASTM F 1216 (including appendixes) and ASTM D 5813 may be conducted at the discretion of the Engineer. Actual sample testing shall be paid for by separately. Testing may be done anytime within one year of final completion except that air tests, or hydrostatic tests, if required, shall be done by the Contractor, at no additional cost to the City, prior to re-establishing service connections.

The Contractor shall prepare samples of the liner for each section of sewer lined in accordance with Section 8 of ASTM F 1216. Samples shall be labeled for date, diameter, section of sewer, and delivered to the Engineer for future testing. When tested, each sample shall meet the physical properties for flexural modulus and flexural strength used in the design calculations.

Air testing on isolated sections of sewer shall be required if post-rehabilitation inspection indicates leaks in the liner. Air testing shall be paid for and conducted by the Contractor. The Contractor shall remove and replace or repair any defects in the installed liner to the satisfaction of the City at no additional costs.

Upon completion of the installation work and after required testing indicates the linings are acceptable, the Contractor shall restore the project area affected by his operation.

MEASUREMENT AND PAYMENT

The completed work as measured for these items of work will be paid for at the unit prices for the following pay items:

Pay Item

Sewer Preliner, 36 inch
Sewer Preliner, 42 inch
Sewer Lining, CIPP, 36 inch
Sewer Lining, CIPP, 42 inch

Pay Unit

Linear Foot
Linear Foot
Linear Foot
Linear Foot

The unit price paid shall be payment in full for all labor, material, and equipment required for rehabilitation of existing sanitary sewer by insertion of a preliner and/or cured in place liner and shall include, but is not limited to: furnishing and installing preliner and/or liner; reconnection of service leads; dewatering; gaining access to work site; removal and replacement of site improvements; post rehabilitation video inspection; and all other items necessary to complete the job, whether specifically mentioned or implied.

**DETAILED SPECIFICATION
FOR
ITEM #225 – MANHOLE REHABILITATION
ITEM #226 – MANHOLE LINING**

DESCRIPTION

This work shall include the furnishing of all materials, equipment, tools, and labor as required for the rehabilitation of the manholes. This work includes lining the manhole interiors, internal sealing of the frame-chimney joint area, and reconstructing manhole benches and channels, if necessary.

Rehabilitation products shall be applied to the manhole from the cover seat to and including the benches. The rehabilitation system must provide a non-prorated warranty as herein described in manholes to stop infiltration, prohibit root intrusion, protect the existing structure from further deterioration, and provide a surface coating resistant to sewer gases and chemicals.

MATERIALS

Cementitious Manhole Lining System:

The cementitious manhole lining system for the interior of manholes shall be a monolithic system suitable for use as a trowel or spray-applied monolithic surfacing in sewer manholes. The cementitious lining system shall be one of the following products or approved equal:

Strong Seal MS-2A, MS-2C, or High Performance by Strong Seal Systems
QM-1s Restore or Aluminaliner by Quadex
Cemtec Silatec MSM or CAM by A.W. Cook Cement
Sewpercoat PG by Kemeos, Inc.
Permacast MS-10,000 or CR-5000 by Action Products Marketing Corp.
PerpetuCrete MSC or CA by Protective Liner Systems
Mainstay ML-72, ML-CA or ML-PF by Madewell
Reliner MSP or Maximum CA Cement by Standard Cement Materials

Where hydrogen sulfide resistance is required and when specified by the Engineer, the cementitious lining system shall be a 100% calcium aluminate product (product comprised of calcium aluminate cement and calcium aluminate aggregate). Partial calcium aluminate products (or blended products) shall not be considered an equal and shall not be approved. The 100% calcium aluminate products shall be one of the following products or approved equal:

High Performance by Strong Seal Systems
Sewpercoat PG by Kemeos, Inc.
Mainstay ML-PF by Madewell
Maximum CA Cement by Standard Cement Materials

The cementitious lining system shall be a pumpable cementitious mortar product specifically for manhole rehabilitation and shall be installed via low-pressure application only. The materials shall be suitable for all the specified design conditions.

The cementitious lining shall be installed on the benches and walls of existing manholes. All cementitious lining shall be troweled smooth after spray application. The cured cementitious lining shall be applied to a minimum total thickness of 1 inch. The cured surfacing thickness shall be smooth, even (without ridges or bumps) and continuous with proper sealing connections to all unsurfaced areas.

The materials used in the cementitious lining systems shall be mixed on site in accordance with the manufacturer's recommendations. Water shall only be added to the materials during the mixing process and prior to material pumping or spray application. No water shall be added at the nozzle.

The cementitious liner when cured shall have the following minimum characteristics at 28 days as measured by the applicable ASTM standards referenced herein:

Minimum compressive strength of 6,000 psi
Minimum bond strength of 130 psi
Shrinkage of less than 0.05%

The cementitious lining shall provide a minimum service life of 25 years.

The cured cementitious lining shall be continuously bonded to all the brick, mortar, concrete, chemical sealant, grout, pipe and other surfaces inside the sewer manhole. Provide bond strength data on cured, cementitious lining based on ASTM test methods.

When cured, the monolithic cementitious lining shall form a continuous, tight-fitting, hard, impermeable surfacing which is suitable for sewer system service and chemically resistant to any chemicals or vapors normally found in domestic sewage.

The monolithic cementitious lining shall cover the complete interior of the existing sewer manhole including the benches (shelves). The lining shall effectively seal the interior surfaces of the sewer manhole and prevent any penetration or leakage of groundwater infiltration.

The lining shall be compatible with the thermal condition of the existing sewer manhole surfaces. Surface temperatures will range from 20°F to 100°F. Provide test data on shrinkage of the cementitious lining based on the ASTM standards referenced herein.

All invert channels shall be coated with grout or cementitious mortar to build up the invert channel to the invert elevations of the new liner pipes; to fill all voids, cracks, holes, etc.; and to form a smooth flow channel. The entire channel shall be coated. The coating shall be a minimum 1/4-inch thick.

The Contractor shall submit complete shop drawings of manhole lining system to demonstrate compliance with these specifications, to show materials of construction and to detail installation procedures. Testing procedures and quality control procedures shall also be submitted. Certifications that the manhole lining was manufactured in accordance with these specifications and the appropriate ASTM standards shall be submitted with each shipment.

Sealants or Grouts

Chemical sealants or grouts used to seal active manhole leaks, to patch cracks, to fill voids and to otherwise prepare the manhole surfaces for the lining installation shall be suitable for the intended purpose and shall be compatible with the lining as certified by the manufacturer.

The grout used to completely stop identified leaks shall be Hydro Active Cut by DeNeef Construction Chemicals or approved equal.

The grout shall provide a minimum service life of 25 years. When cured, the grout shall be suitable for sewer system service and chemically resistant to any chemicals or vapors normally found in domestic sewage. The grout shall be compatible with the thermal condition of the existing sewer manhole surfaces. Surface temperatures will range from 20°F to 100°F.

The grout shall effectively seal the identified leak in the sewer manhole and prevent any penetration or leakage of groundwater infiltration at this location or other nearby locations or within the same pre-cast manhole joint as a direct result of the injected grout.

The Contractor shall submit complete shop drawings of the injectable grout to demonstrate compliance with these specifications, to show materials of construction and to detail installation procedures. Testing procedures and quality control procedures shall also be submitted.

All water necessary for rehabilitation or lining operations shall be furnished by the City at agreed fire hydrant locations. Contact the Wheeler Center: located at 4251 Stone School Road at 734-994-1760 for procedures and fees for the hydrant meter, backflow preventer, and hydrant meter cage. Fees shall be paid by Contractor. Hydrants used by the Contractor shall be pumped down by the Contractor to prevent freezing. Frozen hydrants that were used by the Contractor and not properly closed or pumped down shall be repaired by the Contractor at no additional cost.

QUALIFICATIONS

The cementitious product and grout product shall have been manufactured for installation specifically in manholes for at least five years. The cementitious product shall have been installed in at least 5,000 manholes. References that are documented and that can be verified shall be submitted to demonstrate that the cementitious product meets these requirements. Contact names and numbers shall be included with the references.

In addition, the Contractor performing the work shall be fully qualified, experienced and equipped to complete this work expeditiously and in a satisfactory manner and shall be an approved installer as certified and licensed by the manufacturer.

The Contractor shall have held such certification by the manufacturer to install the specific product being used for a minimum of one year prior to the bid date. The Contractor, as a company, must have at least three years of experience coating manholes with cementitious mortar and shall have successfully installed a cementitious lining in a minimum of 1,000 manholes as documented by verifiable references. Further, the Contractor's proposed superintendent/foreman for the work under this Contract shall have successfully installed a cementitious lining product in a minimum of 500 manholes as documented by verifiable references.

The Contractor shall submit information to demonstrate that he meets the experience requirements.

DELIVERY, STORAGE AND SHIPPING

Care shall be taken in shipping, handling and placing to avoid damaging the lining and/or grout products. Any lining or grout product damaged in shipment, showing deterioration, or which has been exposed to any other adverse storage condition that may have caused damage, even though no such damage can be seen, shall be marked as rejected and removed at once from the work site. While stored, the lining products shall be adequately packaged and protected from UV radiation. The lining products shall be stored in a manner as recommended by the manufacturer.

CONSTRUCTION METHODS

Prior to performance of the actual Work carefully inspect the entire site and locate those manholes designated to be rehabilitated.

Notification

The Contractor shall notify all property owners who discharge sewage directly to the manhole being rehabilitated 72 hours in advance, giving the date, start time and estimated completion time for the work being conducted and the impacts to the property owner.

Bypass Pumping

The Contractor shall maintain flow in the existing sanitary sewer at all times by bypass pumping, as necessary. During wet weather events, the flow in the sanitary sewer will rise rapidly and may become surcharged. Equipment used shall be sufficient to handle anticipated peak flows. The minimum pump size used shall be 400 gpm. Pump noise shall be kept at or below 40 decibels at 100 feet from the source. The Contractor shall maintain flow in such a manner as the existing flow can be adequately transported, including wet weather flow.

The Contractor shall submit a detailed bypass pumping management plan to be reviewed and approved by the Engineer, prior to any obstruction of flows in the sanitary sewer. The Contractor shall plan his operation such that there will be no backups, leaks or discharges of sewerage. The Contractor shall be completely responsible for all clean-up of backups, leaks or discharges of sewerage.

The Contractor shall also furnish and have available on-site; redundant pumping facilities in case of any failure of the pumping system including pumps, piping, electrical equipment, pipe appurtenances, etc. Redundant pumping facilities also include having a backup power generator in case the primary power source fails. The Contractor shall provide an adequate labor force to oversee the bypass pumping including providing labor to maintain 24 hour per day operation and emergency backup service, if necessary. The Contractor will not be able to obstruct flows in the sewer unless the primary and redundant equipment is on-site and in operable condition.

If, at any time during construction, effluent from the existing sewer is not fully contained by the bypass system, gravity service will be restored and work shall be suspended until the problem is resolved to the satisfaction of the Engineer.

All costs for pumping and by-passing flow shall not be paid for separately and shall be considered incidental to manhole rehabilitation and lining.

The Contractor is responsible for videotaping and cleaning the manholes prior to lining operations in accordance with the Detailed Specifications for "Manhole Cleaning and Video Inspection".

Manhole Rehabilitation

The Contractor shall review the video inspections of each manhole with the Engineer. All active, hydrostatic infiltration leaks shall be plugged or sealed with an appropriate grout compatible with the cementitious. Injection grouting may be required to seal active leaks including leaks in existing invert channels and benches. All loose mortar and rubble of existing walls, benches and inverts shall be removed. The Contractor shall prepare the manhole to receive cementitious lining as necessary by reshaping and repairing benches, inverts, and walls where required including smoothing out irregular shaped corbel and chimney sections prior to spray application. All interior surfaces shall be prepared as recommended by the manufacturer. Minimum requirements are as listed below.

1. All cracks and other voids must be repaired and filled with suitable non-shrinking cements, sealants or grouts, including all voids between the existing sewer pipes and manhole walls. All patches shall be smooth and even with the manhole wall.
2. Removal of all steps and filling of all voids around existing manhole rungs/steps.
3. All surfaces shall be suitably prepared for the required bonding of the cementitious lining as recommended by the manufacturer.

Site conditions may preclude the Contractor from mobilizing the sealing, coating and/or lining equipment near the manhole. If the manhole is inaccessible, as determined by the Contractor and the Engineer, the Contractor shall hand apply the coatings and/or liners per the manufacturer's instructions and recommendations? Hand application shall be completed at no additional cost to the City.

Prior to installing the lining, the Engineer (or appointed representative) along with the Contractor must inspect and approve the grouting and/or surface preparation work. The Contractor shall notify the Engineer when the manholes are ready for inspection. The Contractor is responsible for ensuring proper preparation and installation conditions including temperature and moisture regardless of the findings by the Engineer during his inspection.

The manhole lining shall be completed immediately after the inspection, or the manhole may need to be re-cleaned prior to spraying to remove accumulated debris on the benches and walls.

For cementitious lining applications, the walls and benches shall be coated monolithically to the required thickness by spray-on methods in one pass or application. Spray-applied cementitious linings shall be troweled smooth after application.

The invert channel shall be coated with an appropriate quick-set grout product in complete accordance with the manufacturer's instructions.

A complete, watertight seal shall be provided at pipe and manhole wall connections. Contractor shall submit details of how the watertight connections will be made to the Engineer for review and approval.

The manhole lining shall not be installed until all required main sewer rehabilitation and other manhole rehabilitation work are complete.

Field acceptance of the manhole lining shall be based on the Engineer's field inspections and evaluation of the appropriate installation and curing test data.

The lining shall provide a continuous monolithic surfacing with uniform thickness throughout the manhole interior. If the thickness of the lining is not uniform or is less than specified, it shall be repaired or replaced at no additional cost to the City.

INSPECTION AND TESTING

Post-Rehabilitation and Manhole lining Video Inspection

After the manholes are completely lined, the Contractor shall inspect all lined manholes via closed circuit television (CCTV).

All work submitted by the Contractor shall be completed by PACP Certified professionals. A current PACP certification number shall be included for each person creating/gathering inspection reports or performing video inspections.

The purposes of the CCTV inspections are to confirm that the lining has been properly installed and cured.

The camera equipment used for the CCTV inspections shall be one specifically designed and constructed for such inspection. Camera must be operative in 100% humidity conditions. The live image obtained by the camera shall be transmitted to a color monitor of not less than 19 inches. Camera and monitor shall have a minimum 500 line resolution. The monitor shall be located inside the mobile recording studio.

Lighting for the camera shall be adequate to allow a clear picture of the entire periphery of the manholes inspected. Remote control of lighting brilliance, camera focus, and camera movement shall be from a control panel inside the mobile recording studio. Cables and equipment used to propel the camera shall not obstruct the camera view or interfere with the documentation of the manhole conditions.

Camera shall be moved through manhole at a uniform rate. The camera shall be stopped at pipe openings and shall be panned, tilted and rotated to fully view the manhole and all pipe connections. All such inspections shall be documented on computer-generated logs.

Documentation

All post rehabilitation televised manhole inspections performed shall be submitted to the Engineer in electronic (digital) format.

The contractor shall use the City's manhole numbering system on all documentation, which shall be provided by the City.

The Contractor shall provide the City inspection logs listing the location in relation to adjacent manholes and other discernible features. The logs shall indicate size and type of pipe material, length of line from manhole and direction of sewage flow, if present. The logs shall also indicate the time and date of recording.

The digital recording shall include both audio and video information that accurately reproduces the original picture and sound of the video inspection. The video portion of the digital recording shall be free of electrical interference and shall produce a clear and stable image. The audio portion shall be sufficiently free of background and electrical noise as to produce an oral report that is clear and discernible.

Video Overlay:

The video shall include overlay/text display with an initial display screen and with a continuous running screen. Each inspection start shall include overlay display of section details including at a minimum:

1. Date/Time of Inspection
2. MH (City manhole identification number)
3. Pipe connections
4. Pipe Size
5. Direction of Video
6. Flow Level

The continuous running screen shall include a constant display of the MH #, date and depth shall appear on screen. The CCTV inspector shall move or remove overlay display accordingly so it does not interfere with the inspection review of particular observations/defects as the inspection is occurring.

Video Media:

The database file and the corresponding video files shall be submitted to the Engineer on DVD, flash drive or portable external hard drives. One copy of the printed logs (in color) that correspond to the inspections shall be submitted to the Engineer. The Engineer will return the hard drive to the Contractor after the inspections have been reviewed.

Each submittal to the Engineer shall include a transmittal letter, listing the file names and all sewer segments and video files included on the hard drive.

Cementitious Mortar Lining Testing

Samples shall be taken of the installed liner each day that cementitious lining is installed as follows:
one sample if one to five manholes were coated that day,
two samples if six to ten manholes were coated that day,
three samples if eleven to fifteen manholes were coated that day,
four samples if sixteen or more manholes were coated that day.

Samples shall be taken at equally spaced intervals throughout the day. The frequency of tests may be increased by the Engineer and performed by the Contractor at no additional cost to the City when the required tests show that the installed lining does not meet the specifications.

Samples shall be cube samples. At least six cubes shall be taken for each sample for testing. All cube samples shall be taken in the field from the material being sprayed. The Contractor shall show the samples to the Engineer each day and the Engineer shall initial the samples for delivery to the testing laboratory. The Contractor shall properly take and store the samples and shall deliver the samples to the City of Ann Arbor.

The samples shall be tested in accordance with the applicable ASTM standards to verify that the installed liner meets the compressive strength requirements specified herein and the lining manufacturer's published data on the product. Tests shall include 7-day and 28-day strength tests (3 tests/cubes for each time period for each sample). Shrinkage and bond strength tests shall be performed on each batch or lot of material shipped to the Contractor.

MEASUREMENT AND PAYMENT

The completed work as measured for these items of work will be paid for at the unit prices for the following pay items:

<u>Pay Item</u>	<u>Pay Unit</u>
Manhole Rehabilitation	Each
Manhole Lining	Each

The unit price paid shall be payment in full for all labor, material, and equipment required for rehabilitation of existing manholes by grouting and/or sealing the interior wall of manholes; insertion of a cementitious liner and shall include, but is not limited to: furnishing and installing liner; reconnection of service leads; dewatering; gaining access to work site; removal and replacement of site improvements; post rehabilitation video inspection; and all other items necessary to complete the job, whether specifically mentioned or implied.

**DETAILED SPECIFICATION
FOR
ITEM #244 – STRUCTURE COVERS, MODIFIED**

DESCRIPTION

This work shall consist of furnishing new structure covers and castings for existing sewer manholes identified by the Engineer, as detailed on the plans, and as specified herein.

<u>Type of Casting</u>	<i>MDOT</i>	<u>Approx. Pay Weight (lb)</u>	<u>East Jordan Iron Works Casting No.</u>	<i>Neenah Foundry</i>
	<u>Designation</u>			<u>Casting No.</u>
Manhole Flange and Cover	B	400 LB	1040 w/ Type A cover*	R-1642 w/ Type C cover*
Manhole Flange and Cover, Sanitary	Q	400 LB	1040 w/ Type A cover	R-1642 w/ Type C cover*
Barrier Curb Round Flange	R	500 LB	7045 w/ Type M2 grate	R-3031-B w/ Type S grate
Barrier Curb Double Inlet Round Flange	R	500 LB	7045 w/ Type M2 grate	R-3031-B w/ Type S grate
Gutter Inlet	R	300 LB	5080 w/ Type M2 grate	R-3448-D w/ Type S grate
Gutter Double Inlet	R	300 LB	5000, Type M2 grate	R-3448-B Type S grate
Yard Drain (Bee Hive)	G	200 LB	1040, Type 02 grate	R-2560-E1

*Frames and covers shall have machined bearing surfaces. Covers shall have two (2), 1 inch, vent holes located opposite each other and 6 inch from the edge of the cover, except for sanitary sewer manholes. Each cover shall have the word "SEWER", or the word "WATER", or a raised letter "W" cast in the surface, whichever is applicable.

MATERIALS

The materials used for this work shall conform to Section 908.05 of the Michigan Department of Transportation 2012 Standard Specifications for Construction except as specified herein.

CONSTRUCTION METHODS

The construction methods shall be as specified in the related items of work for which the drainage structure covers are provided.

MEASUREMENT AND PAYMENT

The completed work as measured shall be paid at the contract unit price for the following contract items (pay items):

<u>Pay Item</u>	<u>Pay Unit</u>
Structure Covers, Modified	Pound

Payment for this item of work shall include all labor, materials and equipment needed to furnish the drainage structure cover.

Payment will be based upon the weight of the drainage structure cover in U.S. pounds as published in the manufacturers catalog and supporting literature.

**DETAILED SPECIFICATION
FOR
ITEM #271 - PORTABLE, CHANGEABLE MESSAGE SIGN, FURNISH &
OPERATE
ITEM #272 - PLASTIC DRUM - LIGHTED, FURNISH & OPERATE
ITEM #274 - TEMPORARY TYPE B SIGNS
ITEM #276 - LIGHTED, HIGH INTENSITY, CHANNELIZING DEVICE, 42
INCH FURNISH & OPERATE**

DESCRIPTION

This work shall consist of protecting and maintaining vehicular and pedestrian traffic, in accordance with Sections 103.05, 103.06, and 812, of the 2012 MDOT Standard Specifications for Construction; Part 6 of the Michigan Manual of Uniform Traffic Control Devices, Latest Revised Edition (MMUTCD); and the City of Ann Arbor Public Services Department Standard Specifications, except as modified herein.

MATERIALS, EQUIPMENT, AND CONSTRUCTION METHODS

Materials and equipment shall meet the requirements specified in the above-designated sections of the MDOT Standard Specifications.

The Contractor shall maintain two-way traffic on major streets, access for local traffic on local streets, and keep all intersections open to traffic at all times, unless specifically authorized in writing by the Engineer.

The Contractor shall maintain traffic such that no vehicle shall be required to drive into active work areas. Patch areas which extend more than halfway across the roadway shall be removed and replaced so as to provide a minimum of half the pavement width at all times for maintaining traffic.

The Contractor shall keep all driveways open at all times, unless specifically authorized in writing by the Engineer.

The Contractor shall maintain pedestrian traffic at all times. For maintaining normal pedestrian traffic while performing sidewalk and driveway repair, Type I barricades shall be placed by the Contractor, as directed by the Engineer. "Sidewalk Closed" and/or "Cross Here" signs shall be placed, by the Contractor, when directed by the Engineer.

A lane-closure permit shall be obtained by the Contractor from the City Transportation Division, at least 48 hours in advance of any proposed lane or street closing.

The hours of work on all Local streets are 7:00 a.m. to 8:00 p.m., Monday through Saturday, or as specified on the lane-closure permit. No equipment will be allowed in the street before or after these hours. Local streets may only be closed to through traffic (local access only) with written authorization of the Engineer. Work must be completed each day such that all streets are re-opened to through traffic by 8:00 p.m. unless otherwise specified, directed, or authorized in writing by the Engineer. All major changes in traffic control shall be made either between 9:30 a.m. and 3:30 p.m., or between 7:00 p.m. and 6:30 a.m. in order to minimize interference with rush-hour traffic. All traffic controls must be in-place and ready for traffic each day by 6:30 a.m. and 3:30 p.m.

Parking violation citations issued to the Contractor, subcontractor and material suppliers, including their

employees, shall be enforced under appropriate City Code.

Plastic Drums; Type B Temporary Signs and Channelizing Devices

The Contractor shall furnish and operate these items as directed by the Engineer.

Plastic Drums and Channelizing Devices shall be equipped with lights. Lights that are not functioning, shall be replaced by the Contractor at no additional cost. Sufficient signs shall be provided by the Contractor to insure the safety of the workers and the general public in accordance with the current MMUTCD.

MEASUREMENT AND PAYMENT

All temporary traffic/pedestrian control devices furnished by the Contractor shall remain the property of the Contractor. The City shall not be responsible for stolen or damaged signs, barricades, barricade lights or other traffic maintenance items. The Contractor shall replace missing traffic control devices immediately, at no additional cost to the City.

Costs for transporting barricades and other traffic control devices shall be included in the bid prices for the individual items of work.

Payment for furnishing and operating lighted Plastic Drums, Type III barricades and High Intensity, Channelizing Device shall be for the maximum quantity in-place at any one time during the work of the entire project.

Temporary Sign - Type B

Payment for Type B signs shall be for the maximum quantity used.

Portable, Changeable Message Sign, Furnish & Operate

Measurement for furnishing and operating Portable, Changeable Message Sign will be for the maximum quantity in-place at any one time during the work of the entire project.

The completed work as measured for these items of work will be paid for at the Contract Unit Price for the following Contract (Pay) Items:

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Portable, Changeable Message Sign, Furnish & Operate	Each
Plastic Drum, Lighted, Furnish & Operate	Each
Temporary Sign, Type B	Square Foot
Lighted, High Intensity, Channelizing Device, 42 inch Furnish & Operate	Each

Appendix A

MDOT Individual Construction Permit

ATTACHMENTS

CITY OF ANN ARBOR LIVING WAGE ORDINANCE

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

\$12.93 per hour

If the employer provides health care benefits*

\$14.43 per hour

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

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

ENFORCEMENT

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

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

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

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

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



Vendor Conflict of Interest Disclosure Form

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

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

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

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

Vendor Name	Vendor Phone Number
Conflict of Interest Disclosure *	
Name of City of Ann Arbor employees, elected officials, or immediate family members with whom there maybe a potential conflict of interest.	() Relationship to employee _____ () Interest in vendor's company _____ () Other _____

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

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

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

PROCUREMENT USE ONLY

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

CITY OF ANN ARBOR NON-DISCRIMINATION ORDINANCE

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

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

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

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

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

Complaint Procedure: If any individual has a grievance alleging a violation of this chapter, he/she has 180 calendar days from the date of the individual's knowledge of the allegedly discriminatory action or 180 calendar days from the date when the individual should have known of the alleged discriminatory action to file a complaint with the city's Human Rights Commission. If an individual fails to file a complaint alleging a violation of this chapter within the specified time frame, the complaint will not be considered by the Human Rights Commission. The complaint should be made in writing to the Human Rights Commission. The complaint may be filed in person with the City Clerk, by e-mail 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