

CITY OF ANN ARBOR  
INVITATION TO BID



Southside Interceptor Sanitary Diversion Project

ITB No. 4567

Due Date: February 26, 2019 at 10:00 a.m. (Local Time)

Public Services Area - Engineering

Issued By:

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



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## ATTACHMENTS

- City of Ann Arbor Prevailing Wage Declaration Form*
- City of Ann Arbor Living Wage Forms*
- City of Ann Arbor Vendor Conflict of Interest Disclosure Form*
- City of Ann Arbor Non-Discrimination Ordinance Notice and Declaration Form*
- Michigan Department of Environmental Quality – Approved Sanitary Sewer Construction Permit No. P41001863*



## **NOTICE OF PRE-BID CONFERENCE**

A pre-bid conference for this project will be held at 2:00 p.m. on **February 6, 2019** in the Guy C. Larcom Municipal Building, **6<sup>th</sup> Floor Conference Room, at 2:00 p.m.**

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



# INSTRUCTIONS TO BIDDERS

## General

Work to be done under this Contract is generally described through the detailed specifications and must be completed fully in accordance with the contract documents. All work to be done under this Contract is located in or near the City of Ann Arbor.

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

## Preparation of Bids

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

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

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

## Questions or Clarifications / Designated City Contacts

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

All questions shall be due on or before 2:00 p.m., **February 14, 2019** and should be addressed as follows:

Specification/Scope of Work questions emailed to **[mnearing@a2gov.org](mailto:mnearing@a2gov.org)**  
Bid Process and Compliance questions emailed to **[cspencer@a2gov.org](mailto: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 **Michael G. Nearing, P.E., Senior Project Manager** at **[mnearing@a2gov.org](mailto:mnearing@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](http://www.mitn.info) and/or City of Ann Arbor web site [www.A2gov.org](http://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 **10:00 a.m. (Local Time), Tuesday, February 26, 2019**. 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 copies in a sealed envelope clearly marked: **ITB No. 4567, Southside Interceptor Sanitary Sewer Diversion Project**.

### **Bids must be addressed and delivered to:**

City of Ann Arbor  
Procurement Unit,  
c/o Customer Services, 1<sup>st</sup> Floor  
301 East Huron Street  
Ann Arbor, MI 48107

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

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

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

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

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

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

## Award

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



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

## 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](http://www.MITN.info) and obtain an official Bid. Bidders do not need to be shown on the plan holders list provided by MITN to be considered an official plan holder.

## Bid Security

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

## Withdrawal of Bids

After the time of opening, no Bid may be withdrawn for the period of sixty (60) days.

## Contract Time

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

## Liquidated Damages

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

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

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

## Human Rights Information

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

## Wage Requirements

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

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

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

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

## Conflict Of Interest Disclosure

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

## Major Subcontractors

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

## Debarment

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

## Disclosures

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

## Bid Protest

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

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

## Cost Liability

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

## Reservation of Rights

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

## Idlefree Ordinance

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

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

- (a) For any period of time while the Commercial Vehicle is unoccupied; or
- (b) For more than 5 minutes in any 60-minute period while the Commercial Vehicle is occupied.

In addition, generators and other internal combustion engines are covered

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

## Environmental Commitment

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

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



# INVITATION TO BID

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

Ladies and Gentlemen:

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

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

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

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

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

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

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

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

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

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

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

SIGNED THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 2019.

\_\_\_\_\_  
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** \_\_\_\_\_, 2019

(Print) Name \_\_\_\_\_ Title \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

Contact Phone ( ) \_\_\_\_\_ Fax ( ) \_\_\_\_\_

Email \_\_\_\_\_





## BID FORM

### Section 1 - Schedule of Prices

Company: \_\_\_\_\_

Project: **Southside Interceptor Sanitary Diversion Project**

Item No. XXXXXXXX Indicates MDOT Standard Item of Work. See MDOT Standard Specifications for Construction

Item No. XXX7XXX Indicates Modified Item of Work. See Detailed Specification contained in the Contract Documents

ITB No. 4567 City of Ann Arbor File No. 2014-027

<u>Item No.</u>	<u>Pay Item Description</u>	<u>Unit</u>	<u>Estimated Quantity</u>	<u>Unit Price</u>	<u>Total Price</u>
1047051	Audiovisual Recording	LSUM	1	\$ _____	\$ _____
1047051	Certified Payroll Compliance and Reporting	LSUM	1	\$ _____	\$ _____
1507051	General Conditions, Max. <u>\$61,000.00</u>	LSUM	1	\$ _____	\$ _____
2037001	Sewer, Any Size or Depth, Abandon	Ft	148	\$ _____	\$ _____
2037050	Dr Structure, Any Size or Depth, Abandon	Ea	2	\$ _____	\$ _____
2037050	Dr Structure, Any Size or Depth, Remove	Ea	2	\$ _____	\$ _____
2040020	Curb and Gutter, Rem	Ft	150	\$ _____	\$ _____
2040055	Sidewalk, Rem	Syd	40	\$ _____	\$ _____
2060002	Backfill, Structure, CIP	Cyd	1,750	\$ _____	\$ _____
2060010	Excavation, Fdn	Cyd	1,900	\$ _____	\$ _____
2080036	Erosion Control, Silt Fence	Ft	230	\$ _____	\$ _____
2087050	Erosion Control, Inlet Filter	Ea	5	\$ _____	\$ _____
3027021	Aggregate Base Course, 21-AA (C.I.P.)	Cyd	125	\$ _____	\$ _____
4030312	Drainage Structure, Tap, 12 inch	Ea	1	\$ _____	\$ _____
4030324	Drainage Structure, Tap, 24 inch	Ea	1	\$ _____	\$ _____
4030505	MH Riser	Ft	18	\$ _____	\$ _____
4037050	Adjust Structure Cover	Each	3	\$ _____	\$ _____
4037050	Dr Structure Cover, Type K, Special	Ea	1	\$ _____	\$ _____
4037050	Dr Structure Cover, Type Q, Special	Ea	3	\$ _____	\$ _____
4037050	Dr Structure Cover, Type Q2, Special	Ea	2	\$ _____	\$ _____
4037050	Dr Structure, Single Inlet	Ea	1	\$ _____	\$ _____
5010005	HMA Surface, Rem	Syd	660	\$ _____	\$ _____
5010045	HMA, 3E3	Ton	75	\$ _____	\$ _____
5010051	HMA, 4E3	Ton	50	\$ _____	\$ _____
5010057	HMA, 5E3	Ton	80	\$ _____	\$ _____
7060010	Conc, Grade D	Cyd	68	\$ _____	\$ _____

Total this page \$ \_\_\_\_\_

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7060011	Conc, Grade S2	Cyd	9	\$ _____	\$ _____
7060092	Reinforcement Steel, Epoxy Coated	Lb	20,677	\$ _____	\$ _____
7060111	Superstructure Conc, Form, Finish, and Cure	LSUM	1	\$ _____	\$ _____
7060011	Conc, Grade S2	Cyd	9	\$ _____	\$ _____
7060092	Reinforcement Steel, Epoxy Coated	Lb	20,677	\$ _____	\$ _____
7060111	Superstructure Conc, Form, Finish, and Cure	LSUM	1	\$ _____	\$ _____
7067001	Expansive Waterstop	Ft	252	\$ _____	\$ _____
7077051	Miscellaneous Metal Work	LS	1	\$ _____	\$ _____
8027001	Curb and Gutter, F4, Special	Ft	150	\$ _____	\$ _____
8037010	Sidewalk, Concrete, 6 inch, Special	Sft	40	\$ _____	\$ _____
8070000	Guardrail, Type B	Ft	106	\$ _____	\$ _____
8070075	Guardrail, Salv	Ft	106	\$ _____	\$ _____
8070080	Guardrail Reflector	Ea	6	\$ _____	\$ _____
8110063	Pavt Mrkg, Ovly Cold Plastic, Lt Turn Arrow Sym	Ea	2	\$ _____	\$ _____
8110068	Pavt Mrkg, Ovly Cold Plastic, Only	Ea	1	\$ _____	\$ _____
8110070	Pavt Mrkg, Ovly Cold Plastic, Rt and Lt Turn Arrow Sym	Ea	2	\$ _____	\$ _____
8110091	Pavt Mrkg, Polyurea, 4 inch, White	Ft	104	\$ _____	\$ _____
8110092	Pavt Mrkg, Polyurea, 4 inch, Yellow	Ft	318	\$ _____	\$ _____
8110093	Pavt Mrkg, Polyurea, 6 inch, Crosswalk	Ft	89	\$ _____	\$ _____
8110094	Pavt Mrkg, Polyurea, 6 inch, White	Ft	18	\$ _____	\$ _____
8110110	Pavt Mrkg, Polyurea, 12 inch, Crosswalk	Ft	176	\$ _____	\$ _____
8110114	Pavt Mrkg, Polyurea, 24 inch, Stop Bar	Ft	27	\$ _____	\$ _____
<b>Total this page</b>				\$ _____	_____

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<u>Item No.</u>	<u>Pay Item Description</u>	<u>Unit</u>	<u>Estimated Quantity</u>	<u>Unit Price</u>	<u>Total Price</u>
8110450	Recessing Pavement Markings, Longit	Ft	529	\$ _____	\$ _____
8110451	Recessing Pavement Markings, Transv	Ft	599	\$ _____	\$ _____
8120022	Barricade, Type III, High Intensity, Lighted, Furn	Ea	8	\$ _____	\$ _____
8120023	Barricade, Type III, High Intensity, Lighted, Oper	Ea	8	\$ _____	\$ _____
8120250	Plastic Drum, High Intensity, Furn	Ea	15	\$ _____	\$ _____
8120251	Plastic Drum, High Intensity, Oper	Ea	15	\$ _____	\$ _____
8120350	Sign, Type B, Temp, Prismatic, Furn	Sft	343	\$ _____	\$ _____
8120351	Sign, Type B, Temp, Prismatic, Oper	Sft	343	\$ _____	\$ _____
8120352	Sign, Type B, Temp, Prismatic, Special, Furn	Sft	63	\$ _____	\$ _____
8120353	Sign, Type B, Temp, Prismatic, Special, Oper	Sft	63	\$ _____	\$ _____
8120370	Traf Regulator Control	LSUM	1	\$ _____	\$ _____
8127050	Sign, Portable, Changeable Message, NTCIP-Compliant, Furn	Ea	3	\$ _____	\$ _____
8127050	Sign, Portable, Changeable Message, NTCIP-Compliant, Oper	Ea	3	\$ _____	\$ _____
8127051	Minor Traffic Devices, Max. <u>\$7,500.00</u>	LSUM	1	\$ _____	\$ _____
8167011	Hydroseeding	Syd	475	\$ _____	\$ _____
8167011	Topsoil Surface, 4 inch	Syd	475	\$ _____	\$ _____
8237001	PC 350, D.I. Water Main w/Polyethylene Wrap, 12 inch, Tr Det I, Mod.	Ft	34	\$ _____	\$ _____
8237001	PC 350, D.I. Water Main w/Polyethylene Wrap, 12 inch, Tr Det V, Mod.	Ft	80	\$ _____	\$ _____
8237050	45 deg Bend, 12 inch	Ea	4	\$ _____	\$ _____
8237050	Sleeve, 12 inch	Ea	2	\$ _____	\$ _____

Total this page \$ \_\_\_\_\_

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8507001	Dr Structure, Manhole, Type I, 60 inch dia, Sanitary, Add Depth	Ft	33	\$ _____	\$ _____
8507001	Dr Structure, Manhole, Type I, 72 inch dia, Sanitary, Add Depth	Ft	15	\$ _____	\$ _____
8507001	Drop Connection, 12 inch	Ft	4.40	\$ _____	\$ _____
8507001	Drop Connection, 24 inch	Ft	9.30	\$ _____	\$ _____
8507001	Sewer, PC 350 D.I. Pipe, 24 inch, Tr Det I, Modified	Ft	72	\$ _____	\$ _____
8507001	Sewer, PC 350 D.I. Pipe, 30 inch, Tr Det V, Modified	Ft	22	\$ _____	\$ _____
8507001	Sewer, CI C 76 IV, 12 inch, Tr Det I, Modified	Ft	12	\$ _____	\$ _____
8507050	Dr Structure, Manhole, Type I, 60 inch dia, Sanitary	Ea	2	\$ _____	\$ _____
8507050	Dr Structure, Manhole, Type I, 72 inch dia, Sanitary	Ea	1	\$ _____	\$ _____
8507051	Epoxy Coating, Protective, Field Applied	LSUM	1	\$ _____	\$ _____
8507051	Sewer Flow Control	LS	1	\$ _____	\$ _____

Total this page \$ \_\_\_\_\_

Total from Page BF-3 \$ \_\_\_\_\_

Total from Page BF-2 \$ \_\_\_\_\_

Total from Page BF-1 \$ \_\_\_\_\_

**TOTAL BASE BID \$ \_\_\_\_\_**

# BID FORM

## Section 2 – Material, Equipment and Environmental Alternates

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

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

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

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

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

Signature of Authorized Representative of Bidder \_\_\_\_\_ Date \_\_\_\_\_



# BID FORM

## Section 3 - Time Alternate

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

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

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

Signature of Authorized Representative of Bidder \_\_\_\_\_ Date \_\_\_\_\_





# BID FORM

## Section 4 - Major Subcontractors

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

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

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

<u>Subcontractor (Name and Address)</u>	<u>Work</u>	<u>Amount</u>
---	-------------	---------------

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 \_\_\_\_\_



# CONTRACT

THIS AGREEMENT is made on the \_\_\_\_\_ day of \_\_\_\_\_, 2019, 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 Southside Interceptor Sanitary Diversion Project, ITB No. 4567, in accordance with the requirements and provisions of the following documents, including all written modifications incorporated into any of the documents, which are incorporated as part of this Contract:

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

General Conditions  
Standard Specifications  
Detailed Specifications  
Plans  
Addenda

## ARTICLE II - Definitions

Administering Service Area/Unit means Public Services Area, Engineering.

Project means Southside Sanitary Sewer Diversion Chamber Project; City of Ann Arbor File No. 2014-027.

## 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 of this Contract shall be completed in accordance with the Detailed Specification entitled "Project Schedule."
- (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 as stated in the Detailed Specification entitled "Project Schedule" 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.

[signatures continue on next page]

**FOR CONTRACTOR**

By \_\_\_\_\_

Its: \_\_\_\_\_

**FOR THE CITY OF ANN ARBOR**

By \_\_\_\_\_  
Christopher Taylor, Mayor

By \_\_\_\_\_  
Jacqueline Beaudry, City Clerk

**Approved as to substance**

By \_\_\_\_\_  
Howard S. Lazurus  
City Administrator

By \_\_\_\_\_  
Craig A. 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 \_\_\_\_\_, 2019, for: The Southside Interceptor Sanitary Diversion Project; City of Ann Arbor File No. 2014-027 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 \_\_\_\_\_, 2019.

\_\_\_\_\_  
(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 \_\_\_\_\_, 2019, for the Southside Interceptor Sanitary Diversion Project; City of Ann Arbor File No. 2014-027 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 \_\_\_\_\_, 2019.

\_\_\_\_\_  
(Name of Surety Company)

By \_\_\_\_\_  
(Signature)

Its \_\_\_\_\_  
(Title of Office)

Approved as to form:

\_\_\_\_\_  
Stephen K. Postema, City Attorney

\_\_\_\_\_  
(Name of Principal)

By \_\_\_\_\_

(Signature)

Its \_\_\_\_\_  
(Title of Office)

Name and address of agent:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



# **GENERAL CONDITIONS**

## **Section 1 - Execution, Correlation and Intent of Documents**

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

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

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

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

## **Section 2 - Order of Completion**

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

## **Section 3 - Familiarity with Work**

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

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

## **Section 4 - Wage Requirements**

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

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

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

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

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

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

## **Section 5 - Non-Discrimination**

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

## **Section 6 - Materials, Appliances, Employees**

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

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

Adequate sanitary facilities shall be provided by the Contractor.

## **Section 7 - Qualifications for Employment**

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

## **Section 8 - Royalties and Patents**

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

## **Section 9 - Permits and Regulations**

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

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

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

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

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

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

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

## **Section 11 - Inspection of Work**

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

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

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

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

## **Section 12 - Superintendence**

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

## **Section 13 - Changes in the Work**

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

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

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

## **Section 14 - Extension of Time**

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

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

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

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

## **Section 15 - Claims for Extra Cost**

If the Contractor claims that any instructions by drawings or other media issued after the date of the Contract involved extra cost under this Contract, it shall give the Supervising Professional written notice within 7 days after the receipt of the instructions, and in any event before proceeding to execute the work, except in emergency endangering life or property. The procedure shall then be as provided for Changes in the Work-Section 13. No claim shall be valid unless so made.

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

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

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

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

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

## **Section 16 - Progress Payments**

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

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

In the case of Contracts which include only the Furnishing and Delivering of Equipment, the payments shall be; 60% of the Contract Sum upon the delivery of all equipment to be furnished,



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

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

### **Section 17 - Deductions for Uncorrected Work**

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

### **Section 18 - Correction of Work Before Final Payment**

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

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

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

### **Section 19 - Acceptance and Final Payment**

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

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

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

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

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

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

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

## **Section 20 - Suspension of Work**

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

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

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

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

If the Contractor is adjudged a bankrupt, or if it makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of its insolvency, or if it persistently or repeatedly refuses or fails except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or if it fails to make prompt payments to subcontractors or for

material or labor, or persistently disregards laws, ordinances or the instructions of the Supervising Professional, or otherwise is guilty of a substantial violation of any provision of the Contract, then the City, upon the certificate of the Supervising Professional that sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the Contractor 3 days written notice, terminate this Contract. The City may then take possession of the premises and of all materials, tools and appliances thereon and without prejudice to any other remedy it may have, make good the deficiencies or finish the work by whatever method it may deem expedient, and deduct the cost from the payment due the Contractor. The Contractor shall not be entitled to receive any further payment until the work is finished. If the expense of finishing the work, including compensation for additional managerial and administrative services exceeds the unpaid balance of the Contract Sum, the Contractor and its surety are liable to the City for any excess cost incurred. The expense incurred by the City, and the damage incurred through the Contractor's default, shall be certified by the Supervising Professional.

## **Section 22 - Contractor's Right to Terminate Contract**

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

## **Section 23 - City's Right To Do Work**

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

## **Section 24 - Removal of Equipment and Supplies**

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

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

## **Section 25 - Responsibility for Work and Warranties**

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

The Contractor shall guarantee the quality of the work for a period of one year. The Contractor shall also unconditionally guarantee the quality of all equipment and materials that are furnished and installed under the contract for a period of one year. At the end of one year after the Contractor's receipt of final payment, the complete work, including equipment and materials furnished and installed under the contract, shall be inspected by the Contractor and the Supervising Professional. Any defects shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days. Any defects that are identified prior to the end of one year shall also be inspected by the Contractor and the Supervising Professional and shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days. The Contractor shall assign all manufacturer or material supplier warranties to the City prior to final payment. The assignment shall not relieve the Contractor of its obligations under this paragraph to correct defects.

## **Section 26 - Partial Completion and Acceptance**

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

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

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

## **Section 27 - Payments Withheld Prior to Final Acceptance of Work**

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

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

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

## Section 28 - Contractor's Insurance

- (1) The Contractor shall procure and maintain during the life of this Contract, including the guarantee period and during any warranty work, such insurance policies, including those set forth below, as will protect itself and the City from all claims for bodily injuries, death or property damage which may arise under this Contract; whether the act(s) or omission(s) giving rise to the claim were made by the Contractor or by any subcontractor or anyone employed by them directly or indirectly. In the case of all contracts involving on-site work, the Contractor shall provide to the City, before the commencement of any work under this contract, certificates of insurance and other documentation satisfactory to the City demonstrating it has obtained the policies and endorsements required on behalf of itself, and when requested, any subcontractor(s). The certificates of insurance endorsements and/or copies of policy language shall document that the Contractor satisfies the following minimum requirements.
  - (a) Worker's Compensation Insurance in accordance with all applicable state and federal statutes. Further, Employers Liability Coverage shall be obtained in the following minimum amounts:
    - Bodily Injury by Accident - \$500,000 each accident
    - Bodily Injury by Disease - \$500,000 each employee
    - Bodily Injury by Disease - \$500,000 each policy limit
  - (b) Commercial General Liability Insurance equivalent to, as a minimum, Insurance Services Office form CG 00 01 07 98 or current equivalent. The City of Ann Arbor shall be named as an additional insured. There shall be no added exclusions or limiting endorsements specifically for the following coverages: Products and Completed Operations, Explosion, Collapse and Underground coverage or Pollution. Further there shall be no added exclusions or limiting endorsements which diminish the City's protections as an additional insured under the policy. The following minimum limits of liability are required:
    - \$1,000,000 Each occurrence as respect Bodily Injury Liability or Property Damage Liability, or both combined.
    - \$2,000,000 Per Job General Aggregate
    - \$1,000,000 Personal and Advertising Injury
    - \$2,000,000 Products and Completed Operations Aggregate
  - (c) Motor Vehicle Liability Insurance, including Michigan No-Fault Coverages, equivalent to, as a minimum, Insurance Services Office form CA 00 01 07 97 or current equivalent. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles. The City of Ann Arbor shall be named as an additional insured. There shall be no added exclusions or limiting endorsements which diminish the City's protections as an additional insured under the policy. Further, the limits of liability shall be \$1,000,000 for each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.
  - (d) Umbrella/Excess Liability Insurance shall be provided to apply excess of the Commercial General Liability, Employers Liability and the Motor Vehicle coverage enumerated above, for each occurrence and for aggregate in the amount of \$1,000,000.
- (2) Insurance required under subsection (1)(b) and (1)(c) above shall be considered primary as respects any other valid or collectible insurance that the City may possess, including any self-insured retentions the City may have; and any other insurance the City does

possess shall be considered excess insurance only and shall not be required to contribute with this insurance. Further, the Contractor agrees to waive any right of recovery by its insurer against the City.

- (3) Insurance companies and policy forms are subject to approval of the City Attorney, which approval shall not be unreasonably withheld. Documentation must provide and demonstrate an unconditional 30 day written notice of cancellation in favor of the City of Ann Arbor. Further, the documentation must explicitly state the following: (a) the policy number; name of insurance company; name and address of the agent or authorized representative; name and address of insured; project name; policy expiration date; and specific coverage amounts; (b) any deductibles or self-insured retentions which shall be approved by the City, in its sole discretion; (c) that the policy conforms to the requirements specified Contractor shall furnish the City with satisfactory certificates of insurance and endorsements prior to commencement of any work. Upon request, the Contractor shall provide within 30 days a copy of the policy(ies) to the City. If any of the above coverages expire by their terms during the term of this Contract, the Contractor shall deliver proof of renewal and/or new policies and endorsements to the Administering Service Area/Unit at least ten days prior to the expiration date.
- (4) Any Insurance provider of Contractor shall be admitted and authorized to do business in the State of Michigan and shall carry and maintain a minimum rating assigned by A.M. Best & Company's Key Rating Guide of "A-" Overall and a minimum Financial Size Category of "V". Insurance policies and certificates issued by non-admitted insurance companies are not acceptable unless approved in writing by the City.
- (5) City reserves the right to require additional coverage and/or coverage amounts as may be included from time to time in the Detailed Specifications for the Project.
- (6) The provisions of General Condition 28 shall survive the expiration or earlier termination of this contract for any reason.

## **Section 29 - Surety Bonds**

Bonds will be required from the successful bidder as follows:

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

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

## **Section 30 - Damage Claims**

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

## **Section 31 - Refusal to Obey Instructions**

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

## **Section 32 - Assignment**

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

## **Section 33 - Rights of Various Interests**

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

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

## **Section 34 - Subcontracts**

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

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

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

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

## **Section 35 - Supervising Professional's Status**

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

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

## **Section 36 - Supervising Professional's Decisions**

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

## **Section 37 - Storing Materials and Supplies**

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

## **Section 38 - Lands for Work**

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

## **Section 39 - Cleaning Up**

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

## **Section 40 - Salvage**

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

## **Section 41 - Night, Saturday or Sunday Work**

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

## **Section 42 - Sales Taxes**

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



## Section 43

### CONTRACTOR'S DECLARATION

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

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

\_\_\_\_\_  
Contractor

\_\_\_\_\_  
Date

By \_\_\_\_\_  
(Signature)

Its \_\_\_\_\_  
(Title of Office)

Past due invoices, if any, are listed below.



## **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.

Any work modified by the Detailed Specifications shall be performed in accordance with the applicable Detailed Specification(s) contained in these contract documents. Any work not covered by the City Standard Specifications or the project Detailed Specifications shall be performed in accordance with the applicable section(s) of the 2012 Michigan Department of Transportation Standard Specifications for Construction.

The City of Ann Arbor Standard Specifications are available online:

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



# DETAILED SPECIFICATIONS

CITY OF ANN ARBOR  
DETAILED SPECIFICATION  
FOR  
**CERTIFIED PAYROLL COMPLIANCE AND REPORTING**

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12/21/18

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

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

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

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

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

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

CITY OF ANN ARBOR  
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12/21/18

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

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

**d. Measurement and Payment.-** 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>Contract Item (Pay Item)</u>	<u>Pay Unit</u>
Certified Payroll Compliance and Reporting .....	Lump Sum

The unit price for this item of work shall include all supervisory, accounting, administrative, and equipment costs needed to monitor and perform all work related to maintaining compliance with the tasks specified in this Detailed Specification, the City of Ann Arbor Code of Ordinances, its Prevailing Wage Compliance policy and the applicable Federal and State laws.

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

CITY OF ANN ARBOR  
DETAILED SPECIFICATION  
FOR  
**AUDIOVISUAL RECORDING**

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**a. Description.-** This work shall include providing a recording of the physical, structural, and aesthetic conditions of the construction site and adjacent areas as provided herein.

The audiovisual recording shall be:

1. Of professional quality, providing a clear and accurate audio and visual record of existing conditions.
2. Prepared during the 3 week period immediately prior to the Preconstruction Meeting.
3. Furnished to the Engineer a minimum of 2 weeks prior to bringing any materials or equipment within the areas described in this Detailed Specification.
4. Furnished to the Engineer either at, or prior to, the Preconstruction Meeting.
5. Carried out under the supervision of the Engineer.

The Contractor shall furnish 2 copies of the completed recording to the Engineer at, or prior to, the Preconstruction Meeting. An index of the recording, which will enable any area of the project to be easily found on the recording, shall be included. The Contractor shall retain a third copy of the recording for their own use.

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

**b. Production.-** The audiovisual recording shall be completed in accordance with the following minimum requirements:

1. **DVD Format/No Editing.-** The audiovisual recording shall be performed using equipment that allows audio and visual information to be recorded simultaneously and in color. The recording shall be provided on compact discs in DVD format. The quality of the recording shall be equal to or better than the standard in the industry. The recording shall not be edited.



CITY OF ANN ARBOR  
DETAILED SPECIFICATION  
FOR  
**AUDIOVISUAL RECORDING**

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2. **Perspective/Speed/Pan/Zoom.-** To ensure proper perspective, the distance from the ground to the camera lens shall not be less than 12 feet and the recording must proceed in the general direction of travel at a speed not to exceed 48 feet per minute (0.55 miles per hour). 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 and date stamp and digital annotation capabilities. The final copies of the recording 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 shall be included in the lower half of the frame in standard station format (i.e. 1+00). Below the stationing, periodic information is to be shown, including project name, name of area shown, direction of travel, viewing direction, etc.

On streets or in areas where there is no project stationing, assumed stationing shall be used, starting with 0+00 and progressing from west to east or from north to south.

4. **Audio Commentary/Visual Features.-** Locations relative to project limits and landmarks must be identified by both audio and video means at intervals no longer than 100 feet along the recording route. Additional audio commentary shall be provided as necessary during the 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 good visibility. The recording shall not be performed during periods of precipitation or when snow, leaves, or other natural debris obstruct the area being recorded.

**c. Coverage.-** The audiovisual recording 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 or through which they will be transported. The recording shall extend an additional 50 feet outside of all areas. The recording shall include all significant, existing man-made and natural features such as 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.

CITY OF ANN ARBOR  
DETAILED SPECIFICATION  
FOR  
**AUDIOVISUAL RECORDING**

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2. **Private Property.-** Record all private property that may be utilized by the Contractor in conjunction with this project. These project areas must be disclosed by the Contractor prior to using them for the work of this project.

3. **Road Construction Area.-** The recording coverage shall:

- A. Extend to 50 feet outside of the right-of-way as indicated on the Drawings.
- B. Extend 50 feet outside the construction limits on all streets, including side streets.
- C. Both sides of each street shall be recorded

4. **Offsite Access Route along the MDOT Railroad Right-of-way.-** The entire route to/from the site along the MDOT Railroad Right-of-way shall be recorded as indicated in this Detailed Specification, except as modified below:

- A. The recording must proceed in the general direction of travel at a speed not exceeding 176 feet per minute (2 miles per hour).
- B. The coverage area shall include the area of the intended access route and not go beyond the rail road tracks.
- C. The recording shall focus in particular along the railroad tracks, signals, and other similar features likely to be damaged as a result of existing traffic and/or construction traffic.

5. **Project Detour Route.-** The recording coverage shall:

- A. Cover both sides of street with the detoured traffic must be recorded as stipulated herein.

6. **Private Property Bordering the Project Limits or Work Areas.-** Record all areas bordering the project where work is scheduled to occur or where construction traffic could damage the private property, including Glen Court. This is to include buildings, hydrants, pavements, curbs, driveways, decks, landscaping, trees, and all other similar features.

CITY OF ANN ARBOR  
DETAILED SPECIFICATION  
FOR  
AUDIOVISUAL RECORDING

AA:MGN

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7. **Other Areas.-** The Contractor shall record, at their sole expense, other areas where, in their opinion, the establishment of a record of existing conditions is warranted. The Contractor shall notify the Engineer in writing of such areas.

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

**d. Audiovisual Recording Services.-** The following companies are known to be capable of providing the 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.
- Paradigm 2000, Inc.
- Finishing Touch Photo and Video

**e. Measurement and Payment.-** The completed work shall be paid for at the contract unit price for the following contract pay item:

<u>Contract Pay Item</u>	<u>Pay Unit</u>
Audiovisual Recording .....	Lump Sum

Audiovisual Recording shall include all labor, equipment, and materials required to perform the recording and to provide the finished recording the Engineer.

Payment will be made for Audiovisual Recording following the review and acceptance of the recording by the Engineer. Within 21 days following the receipt of the recording, the Engineer will either accept it and authorize payment, or require that any discrepancies in the recording be addressed prior to making payment.

DETAILED SPECIFICATION  
FOR  
AMTRAK, WORK WITHIN RIGHT-OF-WAY

AA:MGN

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01/14/19

**a. Description.-** This work shall be performed in accordance with Section 107 of the Michigan Department of Transportation 2012 Standard Specifications for Construction and the Temporary Permit to Enter Upon State of Michigan Property C.E.-17 ((Revised 9/21/18) copy attached) along with all of its exhibits and attachments between the City of Ann Arbor and the National Railroad Passenger Corporation, and as specified herein.

**b. Requirements.-** The Contractor shall:

1. Notify National Railway Passenger Corporation a minimum of ten (10) calendar days, or more if required, prior to beginning any work within the Michigan Department of Transportation railroad right-of-way.
2. Obtain at his/her sole expense the insurance required by the railroad. For purposes of compliance with this Detailed Specification, any article in the "National Railroad Passenger Corporation Temporary Permit to Enter Upon State of Michigan Property C.E. 17 (Revised 9/21/18)" and its exhibits that indicates that the permittee and/or its Contractor shall either perform work or provide documentation shall be interpreted as being the sole responsibility of the Contractor. The Contractor shall be responsible for procuring any and all required insurance coverages under the "National Railroad Passenger Corporation Temporary Permit to Enter Upon State of Michigan Property C.E. 17 (Revised 9/21/18)" and its exhibits. Insurance required under the "National Railroad Passenger Corporation Temporary Permit to Enter Upon Property C.E. 17 (Revised 9/21/18)" and its exhibits shall be considered primary with respects to 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. Coordinate with the railroad the scheduling of railroad inspectors, flaggers, etcetera. This is to be arranged at time notification.
4. Fully comply with all railroad and permit requirements for working within the railroad rights-of-way or areas covered by this Detailed Specification or its associated attachments.

DETAILED SPECIFICATION  
FOR  
AMTRAK, WORK WITHIN RIGHT-OF-WAY

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5. Provide the required Amtrak Contractor Orientation Training for each person involved in the work as described elsewhere in the contract documents. The cost is \$25.00 per person and can be completed at [www.amtrakcontractor.com](http://www.amtrakcontractor.com) and requires participants to register on the website before accessing the course. It will be necessary to provide a photograph of each employ that will be occupying the railroad right-of-way. A copy of the materials provided by Amtrak that describes the process is attached.
6. Provide all coordination with the railroad needed to complete the work of this project.

Work within or adjacent to the railroad rights-of-way shall not proceed until all approvals from the National Railroad Passenger Corporation and the Norfolk Southern Corporation have been granted.

Contact person:

A project specific contact person will be provided at the time of contract award.

**c. Measurement and Payment.-** This work will not be paid for separately but shall be included in the contract unit prices for other contract items. The Contractor shall not be entitled to any additional payment, adjustments in contract unit prices, other compensation, or an extension of time due to delays caused by the railroad.

The City will be responsible for fees for required railroad inspectors, flaggers, and other railroad workers.

ATTN: Michael Nearing, P.E.

1. TEMPORARY PERMISSION. Temporary permission is hereby granted to:

City of Ann Arbor  
P.O. Box 8647  
Ann Arbor, MI 48107

(hereinafter called "Permittee") to enter property owned by the State of Michigan (hereinafter called "State") and operated, maintained and managed by the National Railroad Passenger Corporation (hereinafter called "Railroad") for the purpose of:

Utilizing Railroad Service/Access Roads

under the terms and conditions set forth below.

- In addition to the \$1,250.00 Temporary Permit preparation fee and the \$460.00 Railroad Protective Liability Insurance waiver fee, Permittee is required to pay in advance Amtrak's Force Account costs estimated at \$55,660.00 as detailed in the attached Force Account Estimate.
- Amtrak shall be paid a management fee equal to ten percent of the total estimated cost. This fee will be assessed in every invoice.

2. LOCATION AND ACCESS. (Give map reference, description or both – include city and state)

MP 36.9 – 37.8 ±, Ann Arbor, MI  
(See Exhibit 1)

(hereinafter called "Property").

3. INDEMNIFICATION. Permittee hereby releases and agrees to defend, indemnify and hold harmless the State and Railroad, as well as its officers, directors, employees, agents, successors, assigns and subsidiaries (collectively the "Indemnified Parties"), irrespective of negligence or fault on the part of the Indemnified Parties, from and against any and all losses and liabilities, penalties, fines, demands, claims, causes of action, suits, and costs (including cost of defense and attorneys' fees), which any of the Indemnified Parties may hereafter incur, be responsible for, or pay as a result of either or both of the following:

- A. injury, death, or disease of any person, and/or
- B. damage (including environmental contamination and loss of use) to or loss of any property, including property of Railroad

arising out of or in any degree directly or indirectly caused by or resulting from activities of or work performed by Railroad and/or Permittee (as well as Permittee's employees, agents, contractors, subcontractors, or any other person acting for or by permission of Permittee) in connection with this Temporary Permit. The foregoing obligation shall not be limited by the existence of any insurance policy or by any limitation on the amount or type of damages, compensation, or benefits payable by or for Permittee or any contractor or subcontractor and shall survive the termination or expiration of this Temporary Permit for any reason.

As used in this section, the term "Railroad" also includes all commuter agencies and other railroads with rights to operate over State property, and their respective officers, directors, employees, agents, successors, assigns and subsidiaries.

4. COMPENSATION FOR PREPARATION OF TEMPORARY PERMIT. Permittee will pay to Railroad the sum of One Thousand, Two Hundred Fifty Dollars (\$1,250.00) as compensation for the preparation of this Temporary Permit. This fee is to be paid upon Permittee's execution of this Temporary Permit and delivered to: Senior Manager Engineering, National Railroad Passenger Corporation, 30th Street Station, 2955 Market Street, Mail Box 64, Philadelphia, PA 19104.

5. STARTING OF USE OF PROPERTY. Permittee shall notify Railroad's Deputy Chief Engineer-Construction, or his/her designee, in writing, at least ten (10) working days before it desires to enter upon the Property. No entry upon the Property will be permitted until this Temporary Permit has been fully executed and specific written permission to enter upon the Property has been received by Permittee via electronic mail from Railroad's Engineering – I&C Department.

6. PERMITTEE ACTIVITIES. All activities performed by or on behalf of Permittee shall be performed so as not to interfere with Railroad's operations or facilities. In no event shall personnel, equipment or material cross a track(s) without special advance permission from Railroad's Deputy Chief Engineer-Construction or his/her designee. If, in the opinion of Railroad's Deputy Chief Engineer-Construction or his/her designee, conditions warrant at any time, Railroad will provide flagging and/or other protection services at the sole cost and expense of Permittee.

7. CLEARANCES. All equipment and material of Permittee shall be kept away from the tracks by the distances set forth in Attachment A hereof, unless specifically otherwise authorized in writing by Railroad's Deputy Chief Engineer-Construction or his/her designee. Permittee shall conduct all operations so that no part of any equipment or material can foul: an operating track; transmission, communication or signal line; or any other structure or facility of Railroad.

8. RESTORATION OF PROPERTY. Upon completion of its work, Permittee shall, at the option of Railroad, leave the Property in a condition satisfactory to Railroad or restore the Property to its original condition. This may include the restoration of any fences removed or damaged by Permittee.

9. TERM OF TEMPORARY PERMIT. The term shall commence on the date Railroad executes this Temporary Permit ("Execution Date"). Railroad will not execute this Temporary Permit until Railroad has received: payment of any fees/costs identified in section 1 hereof, payment of the fee set forth in section 4 hereof, and satisfactory evidence of the insurance required pursuant to section 11 hereof. The term shall extend until the end of the period Railroad determines is necessary for Permittee to accomplish the purpose set forth in section 1 hereof; provided, however, Railroad reserves the right to revoke this Temporary Permit at any time for any reason, and in no event shall this Temporary Permit extend beyond one (1) year from the Execution Date. Under no circumstances shall this Temporary Permit be construed as granting to Permittee any right, title or interest of any kind in any property of Railroad.

10. SAFETY AND PROTECTION. All work on, over, under, within or adjacent to the Property shall be performed in accordance with the document entitled "SPECIFICATIONS REGARDING SAFETY AND PROTECTION OF RAILROAD TRAFFIC AND PROPERTY," a copy of which is attached hereto as Attachment A and incorporated herein. Failure to comply with Railroad's safety requirements and Attachment A shall, at Railroad's option, result in immediate termination of this Temporary Permit, denial of future Temporary Permit requests by Permittee, and forfeiture of all funds paid to Railroad.

11. INSURANCE. Before Permittee commences any work on, over, under, within or adjacent to the Property, Permittee and its contractors (unless Permittee opts to provide the required coverage for them), shall furnish to Railroad's Senior Manager Engineering, evidence of the insurance coverages specified in the document entitled "INSURANCE REQUIREMENTS - NATIONAL RAILROAD PASSENGER

CORPORATION,” a copy of which is attached hereto as Attachment B and incorporated herein.

12. SAFETY TRAINING CLASS. No person may enter upon Railroad property or within twenty-five (25) feet of the centerline of any track or energized wire until he/she has successfully completed Railroad’s contractor orientation computer based safety training class, as noted in section 12 of Attachment A.

13. COMPLIANCE BY CONTRACTORS. Permittee shall take all steps necessary to ensure that its contractors and subcontractors comply with the terms and conditions of this Temporary Permit.

14. REIMBURSEMENT OF COSTS; PAYMENTS. Railroad shall not be responsible for any costs incurred by Permittee in relation to any matter whatsoever. Permittee is required to reimburse Railroad for all costs incurred by Railroad in relation to this Temporary Permit. Without limiting the foregoing, Permittee is required to reimburse Railroad for all costs incurred by Railroad in performing flagging and other protective services and in reviewing any plans, drawings or other submissions.

*Railroad’s costs, expenses and labor charges will be billed to Permittee at Railroad’s then-current standard force account rates. Permittee understands that Railroad employees working under expired collective bargaining agreements may receive future, retroactive hourly wage increases for their work performed in support of Permittee’s activities under this Temporary Permit. Upon payment to the applicable employees of retroactive hourly wage increases (and regardless of whether such payment is made during or after the term of this Temporary Permit), Railroad will invoice Permittee for, and Permittee will pay, the retroactive hourly wage increases, including the applicable overhead additives and benefit costs associated with the support services performed by Railroad.*

Except as specified in section 4 hereof, all payments due from Permittee to Railroad under this Temporary Permit shall be due and payable within thirty (30) days from the date of invoice. Permittee shall have no right to set off against any payment due under this Temporary Permit any sums which Permittee may believe are due to it from Railroad for any reason whatsoever. In the event that Permittee shall fail to pay, when due, any amount payable by it under this Temporary Permit, Permittee shall also pay to Railroad, together with such overdue payment, interest on the overdue amount at a rate of one and one-half percent (1.5%) per month or the highest rate allowed by law, if less than the foregoing, calculated from the date the payment was due until paid. Railroad also has the right to suspend its support services, without penalty, until Permittee has paid all past due amounts with accrued interest. All payments due from Permittee to Railroad hereunder shall be: (a) made by check drawn from currently available funds; (b) made payable to National Railroad Passenger Corporation; and (c) delivered to the address indicated on the invoice. (However, the permit fee referenced in section 4 hereof and the Railroad Protective Liability premium referenced in Attachment B, if applicable, shall be delivered to Railroad at the address set forth in section 4 hereof.) All payment obligations of Permittee under this Temporary Permit shall survive the termination or expiration of this Temporary Permit for any reason.

15. ENVIRONMENTAL AND GEOTECHNICAL TESTS AND STUDIES. Permittee shall not perform any environmental or geotechnical tests or studies (e.g., air, soil or water sampling) unless specifically identified and authorized in section 1 hereof. If any such tests or studies are performed, Permittee shall promptly furnish to Railroad, at no cost, a copy of the results including any reports or analyses obtained or compiled. Except as may be required by applicable law or as authorized by Railroad in writing, Permittee shall not disclose the results of any such tests or studies to anyone other than Railroad or Permittee’s client. Failure to comply with the provisions of this clause shall, at Railroad’s option, result in immediate termination of this Temporary Permit, forfeiture of all compensation paid Railroad therefor, and pursuance of any other remedies (at law or in equity) that may be available to Railroad. The obligations of Permittee under this section shall survive the termination or expiration of this Temporary Permit for any reason.



16. SEVERABILITY. If any provision of this Temporary Permit is found to be unlawful, invalid or unenforceable, that provision shall be deemed deleted without prejudice to the lawfulness, validity and enforceability of the remainder of the Temporary Permit.

17. GOVERNING LAW. This Temporary Permit shall be governed by and construed under the laws of the District of Columbia and pursuant to 49 USC 28103(b) which precludes and preempts any other federal or state laws. All legal proceedings in connection with any dispute arising under or relating to this Temporary Permit shall be brought in the United States District Court for the District of Columbia.

\*AGREED TO AND ACCEPTED BY PERMITTEE:

CITY OF ANN ARBOR

By: \_\_\_\_\_  
(signature)

Title: \_\_\_\_\_  
Must be an Owner/Partner  
or duly authorized representative

Date: \_\_\_\_\_

\* By signing this Temporary Permit, Permittee certifies that this document has not been altered in any manner from the original version as submitted by Railroad.

NATIONAL RAILROAD PASSENGER CORPORATION

By: \_\_\_\_\_  
AVP – Project Delivery

Date: \_\_\_\_\_  
Execution Date

IB/MK/KH

cc: State of Michigan, acting by and through its Department of Transportation  
Attn: Shaun Bates

**ATTACHMENT A**  
**Temporary Permit to Enter Upon Property**

**SPECIFICATIONS REGARDING SAFETY**  
**AND PROTECTION OF RAILROAD TRAFFIC AND PROPERTY (Revised 9/21/18)**

National Railroad Passenger Corporation

In the following Specifications, “Temporary Permit” means Railroad’s “Temporary Permit to Enter Upon Property”; "Railroad" means National Railroad Passenger Corporation; “Chief Engineer" means Railroad’s Chief Engineer or his/her duly authorized representative; “Permittee” means the party so identified in the Temporary Permit; and “Contractor” means the entity retained by the Permittee or the entity with whom Railroad has contracted in a Preliminary Engineering Agreement, Design Phase Agreement, Construction Phase Agreement, Force Account Agreement, License Agreement or other such agreement, as applicable. Reference to “Permittee/Contractor” includes both the Permittee and the Contractor.

(1) Pre-Entry Meeting: Before entry of Permittee/Contractor onto Railroad's property, a pre-entry meeting shall be held at which time Permittee/Contractor shall submit, for written approval of the Chief Engineer, plans, computations, a site specific safety work plan and site specific work plans that include a detailed description of proposed methods for accomplishing the work and protecting railroad traffic in accordance with Amtrak Engineering Practices EP 3014. Any such written approval shall not relieve Permittee/Contractor of its complete responsibility for the adequacy and safety of its operations.

(2) Rules, Regulations and Requirements: Railroad traffic shall be maintained at all times with safety, security and continuity, and Permittee/Contractor shall conduct its operations in compliance with all rules, regulations, and requirements of Railroad (including these Specifications) with respect to any work performed on, over, under, within or adjacent to Railroad’s property. Permittee/Contractor shall be responsible for acquainting itself with such rules, regulations and requirements. Any violation of such rules, regulations, or requirements shall be grounds for the termination of the Temporary Permit and/or the immediate suspension of Permittee/Contractor work, and the re-training of all personnel, at Permittee’s/Contractor’s expense.

(3) Maintenance of Safe Conditions: If tracks or other property of Railroad are endangered during the work, Permittee/Contractor shall immediately notify Railroad and take such steps as may be directed by Railroad to restore safe conditions, and upon failure of Permittee/Contractor to immediately carry out such direction, Railroad may take whatever steps are reasonably necessary to restore safe conditions. All costs and expenses of restoring safe conditions, and of repairing any damage to Railroad’s trains, tracks, right-of-way or other property caused by the operations of Permittee/Contractor, shall be paid by Permittee/Contractor. Any work (or equipment being staged onsite during the work) performed at or near a railroad crossing must not obstruct the view of flashing light units or gates to oncoming traffic.

(4) Protection in General: Permittee/Contractor shall consult with the Chief Engineer to determine the type and extent of protection required to ensure safety and continuity of railroad traffic. Any inspectors, track foremen, track watchmen, flagmen, signalmen, electric traction linemen, or other employees deemed necessary by Railroad, at its sole discretion, for protective services shall be obtained from Railroad by Permittee/Contractor. The cost of same shall be paid directly to Railroad by Permittee/Contractor. The provision of such employees by Railroad, and any other precautionary measures taken by Railroad, shall not relieve Permittee/Contractor from its complete responsibility for the adequacy and safety of its operations.

(5) Protection for Work Near Electrified Track or Wire: Whenever work is performed in the vicinity of electrified tracks and/or high voltage wires, particular care must be exercised, and Railroad’s requirements regarding clearance to be maintained between equipment and tracks and/or energized wires,

and otherwise regarding work in the vicinity thereof must be strictly observed. No employees or equipment will be permitted to work near overhead wires, except when protected by a Class A employee of Railroad. Permittee/Contractor must supply an adequate length of grounding cable (4/0 copper with approved clamps) for each piece of equipment working near or adjacent to any overhead wire.

(6) Fouling of Track or Wire: No work will be permitted within twenty-five (25) feet of the centerline of a track or energized wire or that has the potential of getting within twenty-five (25) feet of such track or wire without the approval of the Chief Engineer. Permittee/Contractor shall conduct its work so that no part of any equipment or material shall foul an active track or overhead wire without the written permission of the Chief Engineer. When Permittee/Contractor desires to foul an active track or overhead wire, it must provide the Chief Engineer with its site specific work plan a minimum of twenty-one (21) working days in advance, so that, if approved, arrangements may be made for proper protection of the railroad. Any equipment shall be considered to be fouling a track or overhead wire when located (a) within fifteen (15) feet from the centerline of the track or within fifteen (15) feet from the wire, or (b) in such a position that failure of same, with or without a load, would bring it within such distance in (a) above and shall require the presence of the proper Railroad protection personnel.

If acceptable to the Chief Engineer, a safety barrier (approved temporary fence or barricade) may be installed at fifteen (15) feet from centerline of track or overhead wire to afford Permittee/Contractor with a work area that is not considered fouling. Nevertheless, protection personnel may be required at the discretion of the Chief Engineer.

(7) Track Outages: Permittee/Contractor shall verify the time and schedule of track outages from Railroad before scheduling any of its work on, over, under, within, or adjacent to Railroad's right-of-way. Railroad does not guarantee the availability of any track outage at any particular time. Permittee/Contractor shall schedule all work to be performed in such a manner as not to interfere with Railroad operations. Permittee/Contractor shall use all necessary care and precaution to avoid accidents, delay or interference with Railroad's trains or other property.

(8) Demolition: During any demolition, Permittee/Contractor must provide horizontal and vertical shields, designed by a professional engineer registered in the state in which the work takes place. These shields shall be designed in accordance with Railroad's specifications and approved by Railroad, so as to prevent any debris from falling onto Railroad's right-of-way or other property. A grounded temporary vertical protective barrier must be provided if an existing vertical protective barrier is removed during demolition. In addition, if any openings are left in an existing bridge deck, a protective fence must be erected at both ends of the bridge to prohibit unauthorized persons from entering onto the bridge. Ballasted track structure must be kept free of all construction and demolition debris.

(9) Equipment Condition and Location: All equipment to be used in the vicinity of operating tracks shall be in "certified" first-class condition so as to prevent failures that might cause delay to trains or damage to Railroad's property. No equipment shall be placed or put into operation near or adjacent to operating tracks without first obtaining permission from the Chief Engineer. Under no circumstances shall any equipment be placed or put into operation within twenty-five (25) feet from the centerline of an outside track, except as approved by Railroad in accordance with Permittee's/Contractor's site specific safety work plan. To ensure compliance with this requirement, Permittee/Contractor must establish a twenty-five (25) foot foul line prior to the start of work by either driving stakes, taping off or erecting a temporary fence, or providing an alternate method as approved by the Chief Engineer. Permittee/Contractor will be issued warning stickers which must be placed in the operating cabs of all equipment as a constant reminder of the twenty-five (25) foot clearance envelope.

If work to be performed on Railroad property involves heavy trucks, equipment, or machinery along the right-of-way, duct lines and pull boxes shall be inspected by on-site Railroad personnel and the equipment operator to ensure they can withstand the weight.

(10) Storage of Materials and Equipment: No material or equipment shall be stored on Railroad's property without first having obtained permission from the Chief Engineer. Any such storage will be on the condition that Railroad will not be liable for loss of or damage to such materials or equipment from any cause.

If permission is granted for the storage of compressed gas cylinders on Railroad property, they shall be stored a minimum of twenty-five (25) feet from the nearest track in an approved lockable enclosure. The enclosure shall be locked when Permittee/Contractor is not on the project site.

(11) Condition of Railroad's Property: Permittee/Contractor shall keep Railroad's property clear of all refuse and debris from its operations. Upon completion of the work, Permittee/Contractor shall remove from Railroad's property all machinery, equipment, surplus materials, falsework, rubbish, temporary structures, and other property of Permittee/Contractor and shall leave Railroad's property in a condition satisfactory to the Chief Engineer.

(12) Safety Training: All individuals, including representatives and employees of Permittee/Contractor, before entering onto Railroad's property and before coming within twenty-five (25) feet of the centerline of a track or overhead wire, must first complete Railroad's contractor orientation computer based safety training class. The class is provided electronically at [www.amtrakcontractor.com](http://www.amtrakcontractor.com). Upon successful completion of the class and test, the individual taking the class will receive a temporary certificate without a photo that is valid for fourteen (14) days. The individual must upload a photo of himself/herself that will be embedded in the permanent ID card. The photo ID will be mailed to the individual's home address and must be worn/displayed while on Railroad property. Training is valid for one calendar year. All costs of complying with Railroad's safety training shall be at the sole expense of Permittee/Contractor. Permittee/Contractor shall appoint a qualified person as its Safety Representative. The Safety Representative shall continuously ensure that all individuals comply with Railroad's safety requirements. All safety training records must be maintained with Permittee's/Contractor's site specific work plan.

(13) No Charges to Railroad: It is expressly understood that neither these Specifications, nor any document to which they are attached, include any work for which Railroad is to be billed by Permittee/Contractor, unless Railroad makes a specific written request that such work be performed at Railroad's expense.

(14) Utilities: All underground utilities, cables, and facilities must be located and protected before any excavating, drilling of any kind, boring, ground penetrating activities, or construction activities take place. This includes, but is not limited to, Railroad and commercial utilities, cables, duct lines, and facilities. The "call before you dig" process must be followed. Railroad is not part of that process; therefore, Permittee/Contractor must contact Railroad's Engineering Department to have Railroad's underground utilities and assets located. If requested by Railroad, existing depths of any utilities being crossed must be verified through test pits performed by Permittee/Contractor as directed by and under the direct supervision of Railroad personnel. Hand digging may be required, as directed by Railroad's on-site support personnel. No activities may be performed in close proximity to Railroad duct bank or communication facilities unless monitored by on-site Railroad personnel. Railroad maintains the right to access its existing cables and conduits throughout construction and reserves the right to upgrade and install new cables and conduits in the affected area. Precautions must be taken by Permittee/Contractor to prevent any interruption to Railroad's operations.

**EXHIBIT B**  
**Temporary Permit to Enter Upon Property  
Maintenance and Repair Contractors**

**INSURANCE REQUIREMENTS**  
**NATIONAL RAILROAD PASSENGER CORPORATION (Amtrak)**  
**Revised as of June 23, 2017**

**DEFINITIONS**

In these Insurance Requirements "State" shall mean State of Michigan, "Railroad" or "Amtrak" shall mean National Railroad Passenger Corporation and as appropriate, its subsidiary Washington Terminal Company ("WTC"). "Contractor" shall mean the party identified as "Permittee" in the Temporary Permit to Enter Upon Property Agreement or the party with whom Amtrak has contracted in the Preliminary Engineering Agreement or Force Account Agreement, as well as its officers, employees, agents, servants, contractors, subcontractors, or any other person acting for or by permission of Permittee or Contractor. "Operations" shall mean activities of or work performed by Contractor. "Agreement" shall mean the Temporary Permit to Enter Upon Property Agreement, Preliminary Engineering Agreement, or Force Account Agreement, as applicable.

**INSURANCE**

Contractor shall procure and maintain, at its sole cost and expense, the types of insurance specified below. Contractor shall evidence such coverage by submitting to Amtrak the original Railroad Protective Liability Policy and certificates of insurance evidencing the other required insurance, prior to commencement of Operations. In addition, Contractor agrees to provide certified copies of the insurance policies for the required insurance within 30 days of Amtrak's written request. All insurance shall be procured from insurers authorized to do business in the jurisdiction(s) where the Operations are to be performed. Contractor shall require all subcontractors to carry the insurance required herein, or Contractor may, at its option, provide the coverage for any or all subcontractors, provided the evidence of insurance submitted by Contractor to Amtrak so stipulates. The insurance shall provide for thirty (30) days prior written notice to Amtrak in the event coverage is substantially changed, canceled or non-renewed. All insurance shall remain in force until all Operations are satisfactorily completed (unless otherwise noted below), all Contractor personnel and equipment have been removed from Railroad property, and any work has been formally accepted. The Contractor may provide for the insurance coverages with such deductibles or retained amounts as Amtrak may approve from time to time, except however that the Contractor shall, at its sole expense, pay for all claims and damages which fall within such deductible or retained amount on the same basis as if there were full commercial insurance in force in compliance with these requirements. Contractor's failure to comply with the insurance requirements set forth herein shall constitute a violation of the Agreement.

1. **Workers' Compensation Insurance** complying with the requirements of the statutes of the jurisdiction(s) in which the Operations will be performed, covering all employees of Contractor. Employer's Liability coverage with limits of not less than \$1 million each accident or illness shall be included.

In the event the Operations are to be performed on, over, or adjacent to navigable waterways, a U.S. Longshoremen and Harbor Workers' Compensation Act Endorsement and Outer Continental Lands Act Endorsement are required.

2. **Commercial General Liability (CGL) Insurance** covering liability of Contractor with respect to all operations to be performed and all obligations assumed by Contractor under the terms of the

Agreement. Products-completed operations, independent contractors and contractual liability coverages are to be included, with the contractual exclusion related to construction/demolition activity within fifty (50) feet of the railroad deleted and no exclusions for Explosion/Collapse/Underground (X-C-U) applicable or added.

The policy shall name the State, National Railroad Passenger Corporation, as appropriate WTC, and all commuter agencies and railroads that operate over the property or tracks at issue as additional insureds with respect to the operations to be performed. In addition the policy shall include an ISO endorsement Form CG 24 17 10 01 or its equivalent providing contractual liability coverage for railroads listed as additional insureds. Coverage for such additional insureds shall be primary and non-contributory as respects any other insurance the additional insureds carry.

Coverage under this policy shall have limits of liability of not less than \$2 million each occurrence, combined single limit, for bodily injury (including disease or death), personal injury and property damage (including loss of use) liability. Such coverage may be provided by a combination of a primary CGL policy and a following form excess or umbrella liability policy.

3. **Automobile Liability Insurance** covering the liability of Contractor arising out of the use of any vehicles which bear, or are required to bear, license plates according to the laws of the jurisdiction in which they are to be operated, and which are not covered under Contractor's Commercial General Liability insurance. The policy shall name the State, National Railroad Passenger Corporation, as appropriate WTC, and all commuter agencies and railroads that operate over the property or tracks at issue as additional insureds with respect to the operations to be performed. Coverage under this policy shall have limits of liability of not less than \$2 million each occurrence, combined single limit, for bodily injury and property damage (including loss of use) liability.

In the event Contractor or any subcontractor will be transporting and/or disposing of any hazardous material or waste off of the jobsite, a MCS-90 Endorsement is to be added to this policy and the limits of liability are to be increased to \$5 million each occurrence.

4. **Railroad Protective Liability (RRP) Insurance** covering the Operations performed by Contractor or any subcontractor within fifty (50) feet vertically or horizontally of railroad tracks. The current ISO Occurrence Form (claims-made forms are unacceptable) in the name of the State, National Railroad Passenger Corporation (and as appropriate WTC, and all commuter agencies and railroads that operate over the property or tracks at issue) shall have limits of liability of not less than \$2 million each occurrence, combined single limit, for Coverages A and B, for losses arising out of injury to or death of all persons, and for physical loss or damage to or destruction of property, including the loss of use thereof. A \$6 million annual aggregate shall apply. Further, "Physical Damage to Property" as defined in the policy is to be deleted and replaced by the following endorsement:

"It is agreed that 'Physical Damage to Property' means direct and accidental loss of or damage to all property owned by any named insured and all property in any named insured's care, custody and control."

The original RRP Liability Insurance Policy must be submitted to Amtrak prior to commencement of Operations.

In the alternative, and upon Amtrak's approval, Contractor may elect to have Amtrak insure the Operations under its Blanket RRP Liability Insurance Program. The premium, which shall be determined by the rate schedule promulgated by the insurer in effect as of the effective date of the Agreement, shall be prepaid by Contractor. In the event Contractor and Amtrak agree to insure the

Operations under Amtrak's RRP Program, Contractor shall include the RRP premium of \$460.00 in addition to the Permit Fee, and send its check made payable to National Railroad Passenger Corporation to the individual set forth below prior to commencement of Operations.

5. **All Risk Property Insurance** covering physical loss or damage to all property used in the performance of the Operations on a full replacement cost basis. The policy shall have limits of liability adequate to cover all property of Contractor (including personal property of others in Contractor's care, custody or control).
6. **Contractor's Pollution Liability Insurance** covering the liability of Contractor arising out of any sudden and/or non-sudden pollution or impairment of the environment, including clean-up costs and defense, that arise from the Operations of Contractor with the State, National Railroad Passenger Corporation, as appropriate WTC, and all commuter agencies and railroads that operate over the property or tracks at issue named as additional insureds. Coverage under this policy shall have limits of liability of not less than \$2 million each occurrence. The coverage shall be maintained during the term of the project, and for at least two (2) years following Amtrak acceptance of the completion of all Operations to be performed.
7. **Pollution Legal Liability Insurance** is required if any hazardous material or waste is to be transported or disposed of off of the jobsite. Contractor, its subcontractor or transporter, as well as the disposal site operator, shall maintain this insurance. Contractor shall designate the disposal site, and must provide a certificate of insurance from the disposal facility to Amtrak. The policy shall name the State, National Railroad Passenger Corporation, as appropriate WTC, and all commuter agencies and railroads that operate over the property or tracks at issue as additional insureds, with limits of liability of not less than \$2 million per claim.

Further, any additional insurance coverages, permits, licenses and other forms of documentation required by the United States Department of Transportation, the Environmental Protection Agency and/or related state and local laws, rules and regulations shall be obtained by Contractor.

8. **Professional Liability Insurance** covering the liability of Contractor for any and all errors or omissions committed by Contractor in the performance of the Operations, regardless of the type of damages. The coverage shall be maintained during the term of the Operations, and for at least three (3) years following completion thereof. The policy shall have limits of liability of not less than \$2 million per claim and in the annual aggregate. The policy may contain a deductible of a maximum of two hundred fifty thousand dollars (\$250,000), but in such case the deductible is the sole responsibility of Contractor, and no portion of such deductible is the responsibility of Amtrak.

If Contractor is not performing professional design or engineering services, Contractor may elect to satisfy this requirement through the addition of endorsement CG2279 "Incidental Professional Liability" to its CGL policy.

9. **Waiver of Subrogation** As to all insurance policies required herein, Contractor waives all rights of recovery, and its insurers must waive all rights of subrogation of damages against the State, Amtrak, as appropriate WTC, and their agents, officers, directors, and employees. The waiver must be stated on the certificate of insurance.
10. **Punitive Damages** Where allowed by law, no liability insurance policies required above shall include an exclusion for punitive or exemplary damages, including but not limited to CGL insurance and Railroad Protective Liability insurance.

11. **Claims-Made Insurance** If any liability insurance specified above shall be provided on a claims-made basis, then in addition to coverage requirements above, such policy shall provide that:
- a. The retroactive date shall coincide with or precede Contractor's start of Operations (including subsequent policies purchased as renewals or replacements);
  - b. The policy shall allow for the reporting of circumstances or incidents that might give rise to future claims;
  - c. Contractor will use its best efforts to maintain similar insurance under the same terms and conditions that describe each type of policy listed above (e.g., Commercial General Liability, Professional Liability) for at least three (3) years following completion of the Operations; and
  - d. If insurance is terminated for any reason, Contractor will purchase an extended reporting provision of at least two (2) years to report claims arising from Operations.
12. **Evidence of Insurance** Contractor shall furnish evidence of insurance as specified above at least fifteen (15) days prior to commencing Operations. Prior to the cancellation, renewal, or expiration of any insurance policy specified above, Contractor shall furnish evidence of insurance replacing the cancelled or expired policies. **THESE DOCUMENTS SHALL INCLUDE A DESCRIPTION OF THE Project AND THE LOCATION ALONG THE RAILROAD RIGHT-OF-WAY (typically given by milepost designation) IN ORDER TO FACILITATE PROCESSING.** The fifteen (15) day advance notice of coverage may be waived by Amtrak in situations where such waiver will benefit Amtrak, but under no circumstances will Contractor begin Operations without providing satisfactory evidence of insurance as approved by Amtrak. Such evidence of insurance coverage shall be sent to:

Senior Manager Engineering  
National Railroad Passenger Corporation  
2955 Market Street  
30th Street Station, Mail Box 64  
Philadelphia, PA 19104-2817





IT IS EXPECTED THAT THE PRIMARY ACCESS LOCATION TO THE PROJECT SITE WILL BE FROM FULLER STREET. HOWEVER, IT WILL BE NECESSARY FOR CONSTRUCTION AND ENGINEERING PERSONNEL TO OCCASIONALLY STAND OR OCCUPY THE ROW.


PROJECT SITE

IT IS EXPECTED THAT THE CONTRACTOR WILL PERIODICALLY ACCESS THE WORK AREA BY ENTERING THE RR ROW AT LONGSHORE DRIVE AND TRAVELING ALONG THE WESTERLY AND/OR SOUTHERLY SIDE OF THE EXISTING RIGHT-OF-WAY.

PROPOSED ACCESS ROUTE

EXHIBIT 1



SHEET No. 1 OF 1	PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR		 CITY OF ANN ARBOR PUBLIC SERVICE 301 EAST HURON STREET P.O. BOX 3647 ANN ARBOR, MI 48107-8647 734-794-6410 www.a2gov.org				
	SOUTHSIDE SANITARY DIVERSION PROJECT						
DRAWING No. 2014-027	AMTRAK RAILROAD ACCESS ROUTE						
				ORIGINAL ISSUE	12/18/2018	DPF	MGN
				REV.	DATE	DRAWN	CHECKED



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**General.-** Traffic shall be maintained in accordance with Sections 104.11, 810, 811, 812, 919, and 920 of the Michigan Department of Transportation (MDOT), 2012 Standard Specifications for Construction and in accordance with the 2011 edition of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD) as amended, except as herein provided.

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 through and 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, and moving traffic control devices for construction operations.

**Materials.-** The materials and equipment shall meet the requirements specified in the sections designated of the MDOT 2012 Standard Specifications for Construction and all Special Provisions contained in these Contract Documents.

**Permits.-** Prior to the start of construction, the Contractor shall obtain a "Right-of-Way" Permit from City of Ann Arbor Planning and Development Services and a "Lane Closure" Permit from City of Ann Arbor Engineering. The fees for these permits will be waived. The lane closure permit must be obtained at least 48 hours in advance of any proposed street or lane closing.

**Work Restrictions.-** During the University of Michigan home football season no work whatsoever will be permitted. All streets and sidewalks shall be fully opened to vehicular and pedestrian traffic. The following are the expected first and last University of Michigan home football game dates for the 2019 calendar year:

August 31<sup>st</sup>  
November 30<sup>th</sup>

The Contractor shall fully familiarize themselves with the entire University of Michigan Home Football Schedule for 2019 and shall schedule and coordinate all work to avoid conflicting with these games and as detailed within this Detailed Specification.

All tree removals and clearing must be performed between October 1<sup>st</sup> and March 31<sup>st</sup> to comply with environmental restrictions.

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**Construction Influence Area (CIA).**- The CIA shall include the area within the Right-of-way of Fuller Street, portions of Fuller Road, portions of the MDOT Railroad Right-of-Way, and Glen Court. The CIA shall also include the affected portions of the private streets and driveways along, and contiguous with these roadways that contain advance warning and/or regulatory signs, pavement markings, plastic drums, traffic delineators, and all other project related traffic maintenance items.

In addition, the CIA shall include the rights-of-way of all roadway segments used for detours and all locations where the Contractor's traffic control devices, pavement markings and signs are used.

**Police and Fire.**- The Contractor shall notify local police, fire departments and emergency response units a minimum of three business days (72 hours) prior to the closure of any roads, or traffic shifts causing restricted movements of traffic or restricted access.

**Work Performed by City of Ann Arbor Signs and Signals Unit.-**

Signal Modifications

The City will modify the existing traffic signal heads on the traffic signal located at the Glen Avenue/Fuller Road/Fuller Street intersection in order to maintain traffic as shown on the contract drawings.

To coordinate such signal modifications, the Contractor shall notify City of Ann Arbor Signs and Signals at least five (5) working days (Monday - Friday) in advance of when the signal modifications will need to be completed. It is the responsibility of the Contractor to ensure that City of Ann Arbor Signs and Signals Unit is scheduled, kept apprised of the progress of construction, and notified immediately (4 working hours) prior to altering the traffic control. The temporary signal modifications shall be completed by City of Ann Arbor Signs and Signals.

No additional or extra compensation will be paid for any delays caused by City of Ann Arbor Signs and Signals.

Sign Reinstallation

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As necessary during construction, the Contractor shall be responsible for logging the legend and location of any signs that:

1. Must be removed to facilitate the construction process;
2. Are to be permanently removed, or;
3. Are to be permanently relocated.

City of Ann Arbor Signs and Signals will remove and store the signs. After construction is complete, but before opening any roadway to traffic, Signs and Signals will reinstall all signs in their proper, permanent location. The City of Ann Arbor shall also install permanent No Parking Signs along the entire length of Stadium Boulevard within the project limits to prohibit on-street parking. To coordinate sign removal and installation/reinstallation, the Contractor shall notify the Signs and Signals Unit at least five (5) working days (Monday-Friday) in advance of when the sign work will need to be completed. It is the responsibility of the Contractor to ensure that City of Ann Arbor Signs and Signals Unit is scheduled, kept apprised of the progress of construction, and notified a second time immediately (4 working hours) prior to the need to complete the sign work. The removal and installation/reinstallation of all signs shall be completed by the City of Ann Arbor Signs and Signals Unit.

No additional or extra compensation will be paid for any delays caused by the City of Ann Arbor Signs and Signals Unit.

**Maintenance of Traffic, General.-** Unless otherwise indicated on the drawings, residential side streets shall not be closed to through traffic except during construction operations of short duration and only with written approval of the Engineer.

Mailboxes requiring relocation due to construction shall be removed and reset immediately by the Contractor in a temporary location approved by the Engineer and meeting the requirements of the United States Postal Service. This work shall be included in the contract pay item "Machine Grading, Modified, \_\_\_".

The Contractor shall not obstruct the remaining traffic lanes in any manner from 7:00 to 9:00 a.m. and from 3:30 to 6:00 p.m. At other times the temporary obstruction of traffic for loading and unloading of trucks will be permitted if the Contractor provides traffic regulators (flag persons) in conformance with Part VI of the MMUTCD. During temporary

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obstructions, a minimum of two traffic regulators are required. The cost of traffic regulators (flag control) shall be included in the contract pay item "Traffic Regulator Control."

The Contractor shall coordinate his operations with all Utilities, Contractors and/or sub-Contractors performing work on this and other projects within, or adjacent to, the Construction Influence Area (CIA).

A minimum of one (1) driveway shall be maintained at all times to all residences and businesses. Walks, driveways, and entrances to buildings shall not be blocked. Vehicular and pedestrian access shall be maintained to all properties.

**Signs and Pavement Markings.-** When lane closures are in place, the Contractor shall completely cover all conflicting warning, regulatory and guide signs in accordance with Section 812.03.D.2 of the Standard Specifications for Construction, 2012 edition, and all applicable details therein.

**Sequence of Construction.-** This Detailed Specification does not describe the full range of materials and processes needed to complete the work under this Contract. It is intended to indicate major project requirements and assist the Contractor in developing, for the review and approval of the Engineer, the Progress Schedule for the project. It is the Contractor's responsibility to review this sequence and all other supporting drawings and Detailed Specifications to determine, on their own, prior to submittal of a bid, a detailed construction process that follows this sequence. If the Contractor determines they cannot perform the work in this sequence, as indicated in the drawings and all other requirements indicated in the Contract Documents, they shall immediately present an alternative construction sequence and approach to the Engineer as part of their bid submittal. The alternative construction sequence will be subject to review and approval by the Engineer. No additional payment shall be provided to the Contractor due to changes to the construction sequence.

The Contractor must submit a detailed Progress Schedule at the Pre-construction Meeting. The Engineer will review the Progress Schedule and ask for any needed revisions in order to bring the Progress Schedule into conformance with the Contract Documents. Unless an alternative sequence is requested by the Contractor, and approved in writing by the Engineer, the work shall be performed in the order as indicated on the Progress Schedule. No work shall commence until such time as the progress schedule has been accepted by the Engineer.

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This sequence of construction is intended to maximize work progress while minimizing damage in, on, and around the working areas of the project.

Some of the work tasks listed below may be performed concurrently, at the discretion of the Contractor, and as approved by the Engineer. Additional sequencing requirements may be specified elsewhere within the Contract Documents and/or Drawings. The work to be performed includes, but is not limited to, the following:

1. Audiovisual recording of the entire project site including the Fuller Street/Glen Court/Fuller Road intersections and the railroad tracks and right-of-way adjacent to the work zone, in accordance with Detailed Specification "Audiovisual Recording" and as required elsewhere in the Contract Documents.

2. Implementation of the required temporary traffic control devices and sidewalk closures in accordance with the Drawings, as detailed in the specifications, and as directed by the Engineer.

3. Implementation of soil erosion and sedimentation control (SESC) measures as indicated on the Drawings, as detailed in the specifications, and as directed by the Engineer. The Contractor shall install only those devices necessary to perform the work of the particular stage or to meet the appropriate federal, state, or local regulations.

4. Perform required clearing and removal of brush marked for removal and downed trees impacting work zones in accordance with the Drawings, as detailed in the specifications, and as directed by the Engineer. All required tree removals will be completed by the City of Ann Arbor prior to March 31<sup>st</sup> in order to comply with environmental restrictions. The Contractor shall remove any remaining brush or materials within the removal area at the time of construction.

5. Remove and salvage existing guardrail along the north side of Fuller Street designated for reinstallation in accordance with MDOT Specifications for Construction. The Contractor shall store and protect the guardrail from damage until such time as it is ready to be re-installed.

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6. Coordinate with City of Ann Arbor Engineering and schedule the shutdown of the existing 12" water main shown on the plans to be relocated. Excavate for and cut and cap the existing 12-inch watermain where directed on plans and remove conflicting watermain.

7. Install temporary earth retention as necessary for excavation and construction of San MH-3.

8. Build proposed San MH-3 around existing 42-inch Northside Interceptor and place new 42-inch sanitary pipe to San MH-2

9. Install temporary plug in the easterly side of the existing 42-inch Southside Interceptor in the existing diversion chamber (structure s-1) to route all flow to the Northside Interceptor.

10. Build proposed diversion chamber, San MH-2, San MH-1 and all connecting pipes to the existing sanitary manhole s-0. Test the sanitary sewers installed in accordance with the project specifications.

11. Remove temporary plug in 42-inch Southside Interceptor in the existing diversion chamber; all flow is thereby routed to new diversion chamber and through to San MH-3.

12. Set-up, install, and test the bypass pumping system. Once the system has received all required approvals, bypass pump existing 24-inch sanitary flow from the existing manhole north of existing san MH s-0 to San MH-2.

13. Tap existing sanitary manhole s-0 with 24-inch sanitary and complete connection to proposed sewer to the south. Bulkhead existing 24-inch pipe to the northwest and provide flow channel. Complete the required testing of the 24-inch sanitary sewer in accordance with the project specifications.

14. Upon approval of the 24-inch sanitary sewer, cease bypass pumping operations and allow flow to carry through existing sanitary manhole s-0 and into the newly constructed 24-inch sanitary sewer.

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15. Abandon and fill existing 24" pipe downstream to existing sanitary manhole s-1 and abandon existing sanitary manhole s-1 in accordance with the project specifications.

16. Modify the existing diversion chamber s-1 as detailed on the plans and abandon the existing 42-inch Northside Interceptor to San MH-3.

17. Complete the backfilling and compaction required around existing or proposed utilities as needed.

18. Complete the relocation of the 12-inch watermain, place and compact all required backfill material, complete the required hydrostatic and bacteriological testing of the relocated 12-inch watermain. Once the 12-inch water main has successfully completed all required testing, place the water main back into service.

19. Furnish, install and compact proposed aggregate, concrete curb and gutter, concrete sidewalk, and HMA paving as called for on plans.

20. Reinstall salvaged guardrail on new posts

21. Perform clean-up and required restoration of the project site in accordance with the Drawings, as detailed in the specifications, and as directed by the Engineer.

22. Upon completion of the work and receipt of approval of the Engineer to re-open the roadway to vehicular traffic, remove all temporary traffic control devices and SESC measures.

**Work Restrictions.-** The Contractor shall plan their work in accordance with the requirements and restrictions herein, as described in other relevant Detailed Specifications, as indicated on the Drawings, and as directed by the Engineer.

1. The Contractor shall maintain un-interrupted access from Glen Court to Fuller Street west of the work zone.

2. Provide a minimum of 7 days advance notice to the City of Ann Arbor – Engineering prior to implementing any sanitary flow diversion measures.



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3. The hours of work shall be as described in the City of Ann Arbor Public Services Department Standard Specifications.

**Bituminous Paving.-** The Contractor shall perform the work of this Contract while maintaining traffic in accordance Contract Documents as specified herein. No traffic shall be allowed on newly placed asphalt surfaces until rolling has been satisfactorily completed and the surface has cooled sufficiently to prevent damage from traffic. This is to be accomplished by traffic regulators (flag persons) and by relocating traffic control devices to prevent traffic from entering the work area until such time that traffic can be safely maintained without damaging the new construction. The Contractor shall provide traffic regulators in sufficient number to maintain traffic as described herein, and to keep traffic off sections being surfaced, and provide for safe travel at all times as directed by the Engineer.

Each pressure distributor, paver and roller shall be equipped with at least one approved flasher light which shall be mounted on the equipment so as to give a warning signal ahead and behind.

For all phases of the project and for each lift of bituminous, the Contractor shall pave the main portion of the roadway and then pave the intersections and returns.

**Temporary Pavement Markings.-** The Contractor shall place temporary pavement markings Type NR, as directed by the Engineer, and in accordance with the requirements of the MMUTCD, when the final pavement markings are not placed prior to opening to traffic. These markings shall be removed prior to the installation of the final pavement markings. The installation and removal of these pavement markings shall be included in "Minor Traf Devices."

**Measurement and Payment.-** All costs for complying with the requirements of this Detailed Specification will not be paid for separately, but shall be included in the bid price of the affected items of work.

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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. The Contractor shall not begin the work of this project until receipt of the fully executed Contract and Notice-to-Proceed. It is expected that the work of this project will begin on Monday, May 6, 2019.

2. The entire work under this Contract including, but not limited to; maintaining traffic; sanitary flow diversion and sewer installation; diversion chamber construction; water main relocation; roadway reconstruction; removal of flow diversion equipment; removal of traffic devices; clean-up and restoration of the site; and all related work shall be completed by the **Substantial Completion** date of **Wednesday, August 21, 2019**.

3. Final restoration of all areas within the project limits and any other disturbed areas shall be completed by the **Final Completion** date of **Friday, September 20, 2019**.

Failure to meet the Substantial Completion date for 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, **\$1,550.00** in Liquidated Damages, and not as a penalty, for delays in the completion of the work for each and every calendar day beyond the Substantial Completion date as defined in this Detailed Specification.

If the Contractor fails to complete the work such that Final Completion cannot be granted by the date specified herein, including time extensions granted thereto as determined by the Engineer, it shall entitle the City to deduct from the payments due the Contractor, **\$750.00** in Liquidated Damages, and not as a penalty, for delays in the Final Completion of the work for each and every calendar day beyond the Final Completion date defined in this Detailed Specification.

The Contractor shall be furnished with 2 copies of the Contract, for their execution, on or about Friday, March 8, 2019. The Contractor shall properly execute both copies of the Contract and return them, with the required Bonds and Insurance Certificates, to the City within 21 calendar days. The Contractor shall not begin the work before the applicable date(s) as described herein without approval from the Engineer, and in no

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case before receipt of the fully executed Contract. **City Council approval is expected Monday, April 15, 2019.**

**This project is on an expedited schedule.** 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 to complete the project within the specified time/date of this Contract.

The hours of work shall be governed by the Ann Arbor City Code and are 7:00 a.m. to 8:00 p.m. Monday through Saturday. Work on Sunday will not be allowed unless approved in advance by the Public Services Area Administrator.

Prior to the start of any construction, including mobilization and staging, the Contractor shall submit a detailed progress schedule of work for the Engineer's review and approval. Work shall not start until a schedule is approved in writing by the Engineer. The proposed schedule must fully comply with the scheduling requirements contained herein, and in other Detailed Specifications contained within the contract documents. The Contractor shall update the approved work schedule upon changes and upon request by the Engineer and present it to the Engineer within 7 days of said request or change.

The Progress Schedule shall include, as a minimum, the controlling work items for the completion of the project and the planned dates that these work items will be controlling operations. When specified in the contract documents, intermediate completion dates, as well as the date the project is to be opened to traffic, and the final project completion date shall also be included in the project schedule.

The Contractor may elect to access the site along the Michigan Department of Transportation's Railroad Right-of-way in accordance with the requirements and restrictions as described in Detailed Specification entitled "Amtrak, Work within Right-of-Way." All terms of the approved permit and the Detailed Specification must be followed.

No work shall be performed, or lane closures, permitted during any University of Michigan Home Football Game weekend, which for the purpose of this contract, is defined as 3:30 p.m. on the Friday immediately prior to the game and extending until 7:00 a.m. on the Monday immediately thereafter. All roadways and sidewalks shall be re-opened for these events.

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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.

If the work required by this construction contract is not completed by the specified date(s) including 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 3 years. If the Engineer elects to terminate the Contract, contract pay items paid for on a Lump Sum basis shall be paid up to a maximum percentage equal to the percentage of the contract work that has been completed.

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a. **Description.-** This work shall consist of performing all needed preparatory work and operations needed to begin the work of the project. All elements of this item of work are to be performed in accordance with the City of Ann Arbor Standard Specifications for Construction (current edition), as shown on the plans, and as directed by the Engineer.

b. **Materials.-** None specified.

c. **Methods of Construction.-** 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, material testing, inspection, and construction surveying and staking;
- Coordination of, and cooperation with, other contractors, agencies, departments, and utilities;
- Coordination with City forces to stockpile and load used castings on City vehicles;
- Protection and maintenance of all existing pipes and utilities, including support, protection, capping, repair, replacement, connection or re-connection of existing pipes and utilities impacted or damaged by the Contractor's operations;
- Maintaining and removing all soil erosion and sedimentation controls (as specified herein or as shown on project plans) for which no pay item exists;
- Maintaining the site, and all areas within the Construction Influence Area, in a well-graded and drained state at all times during the course of the project. De-watering and drainage of all excavations as required to maintain a stable, open hole;
- The continuous maintenance of the temporary road surface within the Construction Influence Area throughout the duration of the construction. This includes any needed grading to maintain the surface in a smooth condition free of potholes, ruts, bumps, or other objectionable conditions.
- Temporary sheeting, bracing, and shoring of excavations in accordance with the applicable MIOSHA Standards;

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- Maintaining access to Glen Court, sidewalks, bike paths, mail deliveries, and solid waste/recycle pick-ups. This includes the placement and maintenance of hot-patching mixture along sidewalks and across sidewalk ramps all as needed and as directed by the Engineer;
- Using quantities of dust palliative, maintenance aggregate, and/or hot patching mixture for use as temporary base, surfacing, and dust control;
- Storing all materials and equipment off lawn areas;
- Temporary removal/re-location, storage, and re-installation/re-setting of existing street name, guide, and regulatory signs, etc. which conflict with the proposed construction;
- Site clean-up on a daily basis during the course of the project's construction;
- Coordination efforts to furnish the various required HMA mixtures as directed by the Engineer;
- Coordination efforts to furnish and operate various-size vehicles/equipment as directed by the Engineer
- Furnishing and operating vacuum-type street cleaning equipment a minimum of once per week, or more frequently, if directed by the Engineer;
- Furnishing and operating vacuum-type utility structure cleaning equipment,
- 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 in accordance with the applicable City of Ann Arbor Ordinances;
- Mobilization(s) and demobilization(s) of all needed materials, equipment, and personnel;

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DETAILED SPECIFICATION  
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GENERAL CONDITIONS, MAX. \$ \_\_\_\_\_

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- Furnishing of all required shop drawings, informational submittals, and material certifications for all needed materials and supplies incorporated into the project;
- The proper off-site disposal of all excavated materials and debris;
- Removal of shrubs, brush, and trees less than 6" diameter (DBH) as shown on the plan sheets or as directed by Engineer;
- Fencing to protect excavation over 1' in depth during non-work hours. The fencing must be a minimum of 36" high, be constructed of orange HDPE material, and reasonably secured to prevent unwanted access;
- All miscellaneous and incidental items such as overhead, insurance, and permits; and,
- Meeting all requirements relating to Debarment Certification, Davis Bacon Act, and Disadvantaged Business Enterprise, and providing the necessary documentation.

d. **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. 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 item (pay item):

<u>Contract Item (Pay Item)</u>	<u>Pay Unit</u>
General Conditions, Max. \$ _____ .....	Lump Sum

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



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 FOR  
**FLOWABLE FILL**

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**a. Description.-** The work shall include placing flowable fill to abandon storm sewer, sanitary sewers, or other encountered utilities, as well as sections of utility trenches where compaction of the specified backfill may not be achievable due to the proximity of surrounding utilities, ground conditions, or the like, and as directed by the Engineer. The work shall be performed in accordance with Section 203 of the 2012 Michigan Department of Transportation Standard Specifications for Construction and as described herein.

**b. Materials.-** Flowable fill shall consist of one of the following mixes:

- a. Portland cement, fly ash, and water.
- b. Portland cement, granular material, fly ash, and water.
- c. Fly ash, granular material and water.

All flowable fill after setting is intended to be removable by conventional mechanical excavation methods.

All materials to be used in flowable fill shall meet the following requirements:

		<u>Specific Gravities ***</u>
Portland Cement	MDOT Std. Spec's. 8.01	3.15
Fly ash	ASTM C 618(1)*	2.40
Granular material Class II	MDOT Std. Spec's. 8.02**	2.60
Water	MDOT Std. Spec's. 8.11	1.00

\*Except there is no limit on the loss on ignition.

\*\*Except that 100% shall pass 3/4-inch sieve.

\*\*\*Specific gravity values used for mix proportions given. If material used differs from these values appropriate adjustments should be made.

Acceptable mixtures for flowable fill are as follows:

- I. FF Mix Number One  
 Cement Stabilized Fly Ash Mixture (Class F Fly Ash)  
 Portland Cement 100 lbs./yd<sup>3</sup>  
 Fly Ash (Class F) 2000 lbs./yd<sup>3</sup>  
 Water Sufficient water to produce the desired  
flowability (approx. 80 gallons/yd<sup>3</sup>)

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FOR  
**FLOWABLE FILL**

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- 2. FF Mix Number Two  
Controlled Density Fill Mixture (Class F Fly Ash)  
Portland Cement 50 lbs./yd<sup>3</sup>  
Fly Ash (Class F) 500 lbs./yd<sup>3</sup>  
Granular Material 2600 lbs./yd<sup>3</sup>  
Water Sufficient water to produce the desired  
flowability (approx. 50 gallons/yd<sup>3</sup>)
  
- 3. FF Mix Number Three  
Controlled Density Fill Mixture (Class C Fly Ash)  
Fly Ash (Class C) 300 lbs./yd<sup>3</sup>  
Granular Material 2600 lbs./yd<sup>3</sup>  
Water Sufficient water to produce the desired  
flowability (approx. 50 gallons/yd<sup>3</sup>)

**c. Construction Methods.-** Flowable fill shall be placed as directed by the Engineer and as specified in the associated item of work’s special provision. The Contractor is responsible to provide all needed materials and appurtenances to properly introduce the flowable fill into the pipe being abandoned. The Contractor shall also provide the needed vent device(s) in order to remove air that becomes trapped during the grouting operations. All measures provided by the Contractor for the introduction and venting of the grouting operations shall be effective.

**d. Method of Payment.-** The cost of Flowable Fill shall be included in the contract unit prices for the items of work for which it is associated and will not be paid for separately.

**SEWER, ANY SIZE OR DEPTH, ABANDON 203B  
DR STRUCTURE, ANY SIZE OR DEPTH, ABANDON 203B**

**CITY OF ANN ARBOR  
DETAILED SPECIFICATION  
FOR  
SEWER, ANY SIZE OR DEPTH, ABANDON  
DR STRUCTURE, ANY SIZE OR DEPTH, ABANDON**

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02/06/14

**a. Description.-** The work shall include abandoning existing sewers and drainage structures, of any size or depth, in accordance with Section 203 of the 2012 Michigan Department of Transportation Standard Specifications for Construction, and as described herein.

**b. Materials.-**

Granular Material, Class II..... Section 902  
Flowable Fill ..... Special Provision for Flowable Fill

**c. Construction Methods.-** “Sewer, Any Size or Depth, Abandon” shall include placing flowable fill the full length and volume of the abandoned sewer. The Contractor’s method to accomplish this will be subject to approval of the Engineer. The Contractor may remove the sewer in lieu of using flowable fill to abandon it. The resulting hole left in a structure from a removed or abandoned sewer shall be bulkheaded with bricks and mortar to provide a watertight seal and constructed such that the remaining flow in the structure is not impeded. With either method, abandonment or removal, the pay item will be “Sewer, Any Size or Depth, Abandon,” and will include all the labor, materials and equipment required to complete the work.

“Dr Structure, Any Size or Depth, Abandon” shall including breaking down structures to a depth 5 feet below the proposed final surface and breaking the manhole base (if using granular backfill). The drainage structure shall be filled with flowable fill or Class II sand compacted to 95% of its maximum unit weight, in lifts not exceeding 8 inches.

Backfill within the public rights-of-way, railroad rights-of-way, or in areas within the influence of paved surfaces or other structures, shall be Granular Material, Class II, compacted to 95% of its maximum unit weight, in maximum lifts of 12 inches. In other areas, the backfill material shall be Engineer approved native material, compacted to 90% of its maximum unit weight, in maximum lifts of 12 inches.

As directed by the Engineer and within two days of their removal, the Contractor shall stockpile on-site, in a location that is mutually agreeable to the Engineer and Contractor, the existing structure covers. The City of Ann Arbor’s forces will pick-up the structure covers at a time that is convenient to them and mutually agreeable to the

**SEWER, ANY SIZE OR DEPTH, ABANDON 203B  
DR STRUCTURE, ANY SIZE OR DEPTH, ABANDON 203B**

**CITY OF ANN ARBOR  
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SEWER, ANY SIZE OR DEPTH, ABANDON  
DR STRUCTURE, ANY SIZE OR DEPTH, ABANDON**

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02/06/14

Contractor. The Contractor shall provide the equipment and manpower to load the castings on the City's vehicle(s) so that they can be removed from the site by the City.

**d. Measurement and Payment.-** The completed work shall be paid for at the Contract Unit Price for the following Contract Items:

<u><b>Contract Item (Pay Item)</b></u>	<u><b>Pay Unit</b></u>
Sewer, Any Size or Depth, Abandon .....	Foot
Dr Structure, Any Size or Depth, Abandon .....	Each

Payment for the above items shall include all labor, material and equipment to complete the work.

SEWER, ANY SIZE OR DEPTH, REM 203C  
STRUCTURE, ANY SIZE OR DEPTH, REM 203C

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FOR  
SEWER, ANY SIZE OR DEPTH, REM  
DR STRUCTURE, ANY SIZE OR DEPTH, REM

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01/25/19

**a. Description.-** This work shall consist of furnishing all labor, tools, equipment, and material to remove, and dispose of off-site, sewers, and/or drainage structures, in accordance with Section 203 of the 2012 Michigan Department of Transportation Standard Specifications for Construction, and as specified herein.

**b. Materials.-**

Granular Material, Class II.....Section 902

**c. Construction Methods.-** Sewers, manholes, and drainage structures shall be removed, and disposed of off-site, in such a manner as not to damage any new work, or work or material which is to remain in-place. The hole or trench resulting from the removal of the manhole, sewer, or drainage structure shall be backfilled with Granular Material, Class II, in maximum lifts of 12 inches, and be compacted to 95% of its maximum unit weight, if located within the public rights-of-way, railroad rights-of-way, or within the influence paved surfaces or structures. Otherwise, backfill shall be Engineer approved native material, compacted to 90% of its maximum unit weight, in lifts of 12 inches or less, unless otherwise noted on the plans. The resulting hole left in a structure from a sewer to be removed shall be bulkheaded with bricks and mortar to provide a watertight seal and constructed such that the remaining flow in the manhole is not impeded.

As directed by the Engineer and within two days of their removal, the Contractor shall stockpile on-site, in a location that is mutually agreeable to the Engineer and Contractor, the existing structure covers. The City of Ann Arbor's forces will pick-up the structure covers at a time that is convenient to them and mutually agreeable to the Contractor. The Contractor shall provide the equipment and manpower to load the castings on the City's vehicle(s) so that they can be removed from the site by the City.

SEWER, ANY SIZE OR DEPTH, REM 203C  
STRUCTURE, ANY SIZE OR DEPTH, REM 203C

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FOR  
SEWER, ANY SIZE OR DEPTH, REM  
DR STRUCTURE, ANY SIZE OR DEPTH, REM

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01/25/19

**d. Measurement and Payment.**- The completed work shall be paid for at the Contract Unit Price for the following Contract Items:

<u>Contract Item (Pay Item)</u>	<u>Pay Unit</u>
Sewer, Any Size or Depth, Rem.....	Foot
Dr Structure, Any Size or Depth, Rem.....	Each

Payment for the above items shall include all labor, material and equipment to complete the work of removing sewers and drainage structures of any size or depth as detailed herein.

CITY OF ANN ARBOR  
SPECIAL PROVISION  
FOR  
SOIL EROSION CONTROL INLET FILTER

FTCH:KAP

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12/21/18

**a. 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.

**b. 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.

The Contractor shall submit product data sheets and a sample of the filter material for inlet filters for Engineer approval prior to ordering materials.

**c. 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.

**d. Measurement and Payment.-** The completed work of Soil Erosion Control Inlet Filter will be paid for at the contract unit price for the following contract items (pay items):

<u>Contract Item (Pay Item)</u>	<u>Pay Unit</u>
Erosion Control, Inlet Filter .....	Each

"Erosion Control, Inlet Filter" will be measured by the unit installed and will be paid for at the contract unit price per each, for which price shall be payment in full for all labor, equipment, and materials needed to furnish, install, maintain, clean and remove the inlet filter, and re-install and/or replace the inlet filter as needed.

CITY OF ANN ARBOR  
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FOR  
**SUBBASE AND AGGREGATE BASE**

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**a. Description.-** This work shall consist of constructing subbase and/or aggregate base courses, on either a prepared subgrade or subbase as indicated on the Plans or where directed by the Engineer. This work shall be performed in accordance with Sections 301, 302, and 307 of the 2012 MDOT Standard Specification for Construction except as specified herein.

**b. Materials.-** The material used for this work shall meet the requirements of Sections 301, 302, 307, and 902 of MDOT 2012 Standard Specification for Construction, except that the aggregate base shall be 21-AA limestone and the subbase shall be Class II Granular Material.

**c. Construction Method.-** Subbase and aggregate base courses shall not be placed when there are indications that the mixture may become frozen before the maximum unit weight is obtained, and in no case shall they be placed on a frozen subbase or subgrade.

The subbase and subgrade shall be shaped to the crown and grade specified on the plans and maintained in a smooth condition. The top of the subbase shall be placed to within  $\pm\frac{1}{2}$  inch of the plan grade and crown. The top of the aggregate base shall be placed to within  $\pm\frac{1}{2}$  inch of the plan grade and crown. Variations within this tolerance shall be gradual. If in the opinion of the Engineer, the Contractor's equipment is causing or will cause any ruts in or damage to the subbase or subgrade, the equipment shall not be permitted on the subbase or subgrade.

Should the subgrade, subbase or aggregate base become damaged due to the Contractor's equipment or by local traffic, the subgrade, subbase, or aggregate base course shall be restored to the condition required by the Specifications without additional compensation to the Contractor.

No pavement course, concrete curb and gutter, or concrete driveway opening shall be placed until the subbase has been compacted to not less than 95 percent, and aggregate base course to not less than 98 percent of their respective maximum dry densities and until a "Permit to Place" has been issued by the Engineer.

Base course aggregate shall be handled and/or stockpiled on-site in a manner that minimizes segregation. Base course aggregate shall be deposited from trucks or through a spreader in a manner that will minimize segregation of material and that is approved by the Engineer. The re-handling of base course aggregate by the Contractor will not be considered sufficient cause to allow the material to become segregated. The Contractor



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SUBBASE AND AGGREGATE BASE

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may be required to wet the materials prior to and/or during placement to minimize segregation and to aid in compaction of the material should it be necessary.

All structures, including manholes, valve boxes, inlet structures and curbs shall be protected from damage and contamination by debris and construction materials. Structures shall be maintained clean of construction debris and properly covered at all times during the construction.

The Contractor may be charged for the cleaning by others of accumulated construction debris in the utility structures, and damages resulting from the uncleaned structures.

**d. Measurement and Payment.**- The completed work as measured will be paid for at the contract unit prices for the following contract items (pay items):

<u>Contract Item (Pay Item)</u>	<u>Pay Unit</u>
Aggregate Base, 21-AA (C.I.P.).....	Cubic Yards

"Aggregate Base, 21-AA (C.I.P.)" will be measured by area in cubic yards compacted in place. The items of work will be paid for at the contract unit prices, which shall be payment in full for all labor, material and equipment needed to accomplish this work.

CITY OF ANN ARBOR  
 DETAILED SPECIFICATION  
 FOR  
**DRAINAGE STRUCTURE COVERS**

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12/21/18

**a. Description.-** This work shall consist of furnishing drainage structure covers as detailed on the plans and as specified herein.

<u>Type of Casting</u>	<u>MDOT Designation</u>	<u>Approx. Weight (lb)</u>	<u>East Jordan Iron Works Casting No.</u>	<u>Neenah Foundry 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*
Diversion Chamber Casting and Cover	Q2	500 LB	1330a w/ Type A cover*	R-1752 w/ Type C cover*
Barrier Curb Double Inlet Round Flange	K	500 LB	7045 w/ Type M2 grate	R-3031-B w/ Type S grate

\*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.

**b. 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.

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

**d. Measurement and Payment.-** The completed work as measured shall be paid at the contract unit price for the following contract items (pay items):

<u>(Contract Item) Pay Item</u>	<u>Pay Unit</u>
Dr Structure Cover, Type ____, Special.....	Each

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

CITY OF ANN ARBOR  
DETAILED SPECIFICATION  
FOR  
**ADJUST STRUCTURE COVER**

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**a. Description.-** This work shall include the final adjustment of structure covers in accordance with Section 403 of the Michigan Department of Transportation 2012 Standard Specifications for Construction, as shown on the plans, and as specified herein. The adjustment of existing valve wells, existing valve boxes, and monument boxes will also be included in this item of work.

The Contractor shall also be required to coordinate the adjustment of private utility structure covers and ensure that the adjustment has been properly performed with the respective utility prior to placing any final paving materials.

**b. Materials.-** In bituminous pavement areas, adjustments shall be made using MDOT P-NC concrete (658 lbs/cyd) as specified in Section 601 of the MDOT 2012 Standard Specifications for Construction. In areas of concrete pavement, adjustments shall be made at the time of paving and encased with the grade of concrete used in the roadway.

**c. Methods of Construction.-** Structure Covers, monument boxes, water valve boxes and all other public utility underground access or control point covers shall be adjusted to conform to the finished surface section and elevation. The adjusting of castings in lawn areas shall be performed in a one-step process. The adjusting of castings in a bituminous pavement area shall be performed in two steps: step one is the lowering of the structure cover to below the subgrade elevation and plating of the structure; step two is the final adjustment to finish grade made prior to placing the bituminous wearing surface. In areas of concrete pavement, the final adjustment of the structure to finish grade shall be made at the time of concrete pavement forming. All structures in areas of concrete pavement shall be approved by the Engineer prior to the placement of any concrete pavement.

There shall be a minimum of one, and maximum of three, 2" tall, concrete brick or pre-cast adjustment rings on manholes and vaults. If necessary, remove the cone, add or remove manhole sections and replace the cone to comply with these adjustment ring limits. If this work is necessary, it shall be paid for as "Additional Depth Structure, Adjust/Repair."

All structures final adjustment is to be to the elevation which results in their top surface being flush with the finished grade. The work is to be accomplished and checked by using a 10 foot straight edge that is placed parallel, and then perpendicular to, the pavement centerline. Failure to meet these conditions will result in the readjustment of the structure and finish patching of the area, as directed by the Engineer, at the Contractor's expense.

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All private utility manholes and valve covers (Edison, Gas, Ameritech, etc.) will be adjusted during this project by the Utility. It is the responsibility of the Contractor to coordinate with these private utilities by giving adequate notice and arranging for any adjustment of structures or valves by these utilities. It shall be the sole responsibility of the Contractor to ensure that this work is completed in a timely manner.

The Contractor shall replace all existing structures covers, top portions of valve boxes and monument boxes.

As directed by the Engineer and within two days of their removal, the Contractor shall stockpile on-site, in a location that is mutually agreeable to the Engineer and Contractor, the existing structure covers. The City of Ann Arbor's forces will pick-up the structure covers at a time that is convenient to them and mutually agreeable to the Contractor. The Contractor shall provide the equipment and manpower to load the castings on the City's vehicle(s) so that they can be removed from the site by the City.

All adjustments in areas of proposed bituminous pavement shall be backfilled with Grade P-NC concrete, from the depth of excavation necessary for adjustment, to an elevation 2 inches below the top flange or adjusted casting. This material shall be included in this item of work and will not be paid for separately.

Structure covers shall be adjusted to between flush and ¼ inch below final pavement surfaces.

There is a possibility that the Contractor may find hidden utility structures during the work. It is the Contractor's responsibility to inform the respective utility owner(s) of the findings. In such instances, the City may direct the Contractor to adjust the structure(s) to grade. This work will be paid as "Adjust Structure Cover."

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FOR  
ADJUST STRUCTURE COVER

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**d. Measurement and Payment.**- The completed work as measured for "Adjust Structure Cover" will be paid for at the contract unit price for the following contract item (pay item):

<u>Contract Item (Pay Item)</u>	<u>Pay Unit</u>
Adjust Structure Cover .....	Each

"Adjust Structure Cover" will be measured and paid for at the contract unit price for each structure that is adjusted, which price shall be payment in full for all labor, equipment and material needed to accomplish this work.

Payment for adjusting for new drainage structures, new manholes, new valves-in-wells and new valves-in-boxes shall be included in the respective items and will not be paid for under this item. The work for adjusting these items, however, shall be performed in accordance with this special provision.

CITY OF ANN ARBOR  
SPECIAL PROVISION  
FOR  
**DRAINAGE STRUCTURES**

AA:MGN

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**a. Description.-** This work shall consist of constructing drainage structures in accordance with Section 403 of the Michigan Department of Transportation 2012 Standard Specifications for Construction, as shown on the plans, and as specified herein.

**b. Materials.-** The materials used for this work shall conform to Subsection 403.02 of the Michigan Department of Transportation 2012 Standard Specifications for Construction, except as specified herein.

Storm sewer drainage structures shall be constructed of precast or cast-in-place reinforced concrete sections, or concrete masonry units. All sanitary sewer manholes and gate wells (water main valve manholes) shall be constructed of precast reinforced concrete sections.

Precast reinforced concrete bases, bottom sections, manhole risers, grade adjustment rings, concentric cones, eccentric cones, and flat slab tops shall conform to the requirements of ASTM C-478. Joints on precast manholes used on all sanitary sewers shall meet ASTM C-443, rubber O-ring gasket.

Precast manhole tees and radius pipe sections shall conform to requirements for reinforced concrete pipe, ASTM C-76, Class IV. Joints shall conform to adjacent pipe. Tees and radius pipe shall conform to details indicated on drawings offered by the Concrete Pipe Association of Michigan, Inc., or Engineer approved equal.

If precast drainage structures are used, they shall be designed to accommodate HL-93 Modified Live Load requirements as determined by a Professional Engineer licensed by the State of Michigan, regardless of where they are to be installed. For the purposes of design, a HL-93 Modified Live Load shall consist of 1.2 times the design truck or 1.2 times a single 60 kip load, whichever produces the greater stresses.

If precast structures are used, the Contractor shall field verify inverts prior to fabricating precast units. No additional payment will be made to the Contractor for precast units that cannot be used due to existing inverts being different than shown on the plans, changes in vertical or horizontal alignment due to conditions found in the field, or similar unforeseen circumstances.

If the Contractor elects to use pre-cast drainage structures, or if portions of the drainage structures are constructed with pre-cast concrete elements, the Contractor shall submit to the Engineer for review and approval shop drawings in accordance with Section

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SPECIAL PROVISION  
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**DRAINAGE STRUCTURES**

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104.02 of the Michigan Department of Transportation 2012 Standard Specifications for Construction.

For each submittal or resubmittal, the Contractor shall allow at least 14 calendar days from the date of the submittal to receive the Engineer's acceptance or request for revisions. The Engineer's comments shall be incorporated into the submitted plans, calculations and descriptions. The Engineer's acceptance is required before beginning the work. Resubmittals shall be reviewed and returned to the General Contractor within 14 calendar days. Required revisions will not be a basis of payment for additional compensation, extra work, or an extension of contract time. The Contractor shall include time for this entire review process in his/her CPM network schedule.

Concrete masonry units shall conform to the requirements for concrete masonry units for catch basins and manholes, ASTM C-139.

Concrete brick shall conform to the requirements for concrete building brick, ASTM C-55, Grade N-1.

Slide gate assemblies for use on structures with weirs shall be designed to meet or exceed the current AWWA Standard C513. The slide plate, guide frame, and yoke pedestal shall be fabricated from minimum ¼" thickness 6061-T6 aluminum plate and shapes, and shall be designed to deflect no more than 1/360 of the span width under full design head. Slide gate upper seals shall be fabricated Ultra High Molecular Weight Polyethylene. Weir gate invert seals shall be fabricated from neoprene. All seals shall prevent leakage without requiring adjustments. Gate operators shall be non-rising stem type with a bronze operating nut supported by roller thrust bearings top and bottom secured in an accurately machined cast aluminum housing bolted to the pedestal. Stems shall be 1½" diameter stainless steel rod.

Where specified on the plans, use a PVC liner that is 30 mils thick. The PVC liner shall be seamless for its entire length and width in its installed position. Use resins to manufacture the PVC liner that are 100 percent first quality virgin polyvinyl chloride. The PVC liner must be resistant to ultraviolet degradation, construction damage and all forms of biological and chemical degradation normally encountered in highway construction applications. Satisfy the physical properties contained in the following table.

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**DRAINAGE STRUCTURES**

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**PVC Liner Physical Requirements**

Property	Test Method	Requirement
Thickness Tolerance	ASTM D 1593	5+/- percent
100 Percent Modulus	ASTM D 882	1000 psi (minimum)
Elongation @ Break	ASTM D 882	300 percent (minimum)
Dimensional Stability	ASTM D 1204 (212 degrees F, 15 minutes)	5 percent change (maximum)

With each material shipment, provide test data certification from the manufacturer which includes a certified report of quality control test results obtained from the lot(s) of material in the shipment. Label each unit of material to provide product identification sufficient for field identification and correlation to certified test results. Certify the specified physical properties as minimum average roll values (MARV).

Plastic coated manhole steps shall be injection molded of copolymer, polypropylene, encapsulating a 1/2 inch grade 60 steel reinforcing bar. Plastic-coated manhole steps shall meet the performance test described in ASTM C-478, Paragraph II, and shall have an impact resistance of 300 ft.-lbs. with only minor deflection and no cracking or breaking. The steps shall resist pull out forces of 1500 lbs.

**c. Methods of Construction.-** The construction methods used shall conform to Section 403.03 of the Michigan Department of Transportation 2012 Standard Specifications for Construction except as specified herein.

Where a structure currently exists and a new structure is required to be constructed in the same location, the Contractor shall excavate, remove, and dispose of the existing drainage structure included in the unit price for the structure to be constructed.

Excavation shall be carried to the depth and width required to permit the construction of the required base. The excavation width shall be greater than the base. The bottom of the excavation shall be trimmed to a uniform horizontal bed and be completely dewatered before any concrete is placed therein. Precast manhole bases and precast bottom sections are allowed.



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Concrete block construction shall only be allowed for storm sewer manholes and inlets and shall be built of the size and dimensions shown on the Plans. The block shall be clean, laid in a full bed of mortar, and thoroughly bonded by completely filling the vertical end grooves with mortar so as to interlock with the adjacent block. The mortar beds and joints shall not exceed 3/4 inch thickness. The vertical joints are to be completely filled with the joints on the inside face rubbed full of mortar and struck smooth as the manhole, inlet or structure is built up. The entire outside face of the structure shall receive a 1/2" thick mortar coat and struck smooth. All masonry materials, sand, and water shall be heated to over 50° F during freezing weather, and the completed work shall be covered and protected from damage by freezing.

Circular precast manhole sections shall be constructed in accordance with the details as shown on the plans. Manhole stack units shall be constructed on level poured-in-place bases, precast concrete bases, or precast concrete bottom sections.

Precast cone sections shall be constructed in accordance with the details as shown on the plans. These units shall be eccentric for all manholes, precast or block. All structures shall be topped with a minimum of one, and a maximum of three, 2" tall, brick or precast adjustment courses.

Manholes, inlets, gate wells and structures shall be constructed within 2-1/2 inches of plumb.

Frames and cover castings shall be set in full mortar beds and pointed on the structure interior to a smooth, brushed finish. The covers shall be set flush with sidewalk, roadway pavement, or ground surfaces. The Engineer shall be notified prior to the final paving so as to allow inspection of the final casting adjustments for all utility structures. In gravel streets, covers shall be set six to eight inches below finished gravel surface.

Sewer pipes shall extend into structures a minimum of 1/2 inch and a maximum of 3 inches.

Flow channels for sewer structures shall be finished in accordance with the details as shown on the plans. All flow channels shall be screeded and floated to a smooth, uniform surface and troweled to a hard surface finish.

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Stubs for future sewer connections shall be furnished and placed by the Contractor as shown on the Plans and as directed by the Engineer. Connections shall be properly supported and braced when not resting on original ground so that any settlement will not disturb the connection. Stubs shall consist of one length of sewer pipe, of the size indicated on the Plans, with a watertight plug.

The excavation shall be kept in a dry condition. All necessary dewatering shall be paid for separately in accordance with the Special Provision entitled "Dewatering".

All necessary adjustments for new structures shall be included in the cost of the structure.

Temporary drainage structures shall be constructed as specified in the plans and consist of a typical manhole riser with no manhole base. The excavation for temporary drainage structures shall be performed such that the bottom portion of the manhole penetrates into the existing granular soil layer and water is permitted to infiltrate through the granular base. If the sand layer is not reached at the depth indicated in the plans, the Contractor shall excavate to a depth a minimum of 6 inches into said sand layer. The bottom of the excavation shall be trimmed to a uniform horizontal bed and be completely dewatered. The manhole riser section shall be placed on existing granular material and supplemented with coarse aggregate (MDOT 6A or other Engineer approved material) such that the manhole is stable and will remain plumb during the entire construction process.

Removal and/or abandonment of the temporary drainage structures shall be performed as shown on the plans and as directed by the Engineer.

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**d. Measurement and Payment.-** The completed work as measured shall be paid at the contract unit price for the following contract items (pay items):

<u>(Contract Item) Pay Item</u>	<u>Pay Unit</u>
Dr Structure, Manhole, Type I, ___ inch dia.....	Each
Dr Structure, Manhole, Type I, ___ inch dia, Add Depth.....	Foot
Dr Structure, Manhole, Type III, ___ inch dia.....	Each
Dr Structure, Manhole, Type III, ___ inch dia, with Weir.....	Each
Dr Structure, Manhole, Type III, ___ inch dia, with Custom Base.....	Each
Dr Structure, Manhole, Type III, ___ inch dia, Add Depth.....	Foot
Dr Structure, Single Inlet, ___ inch dia.....	Each
Dr Structure, Single Inlet, ___ inch dia, Add Depth.....	Foot
Dr Structure, Inlet-Junction Chamber.....	Each
Dr Structure, Inlet-Junction Chamber, Add Depth.....	Foot
Dr Structure, Double Inlet.....	Each
Dr Structure, Double Inlet, Add Depth.....	Foot
Dr Structure, Temporary, ___ inch dia	Each
Dr Structure, Temporary, ___ inch dia, Add Depth	Foot

Payment for drainage structures includes furnishing the labor, equipment and materials for all necessary excavation, disposing of surplus excavated material, backfilling, and constructing the structure complete, including pipe connections and structure cleaning. A standard depth manhole shall be considered to be 8 feet or less in depth (including sump).

Payment for temporary drainage structures includes constructing the structure as show on the plans and as detailed in the specifications; removing and disposing off-site of the drainage structure when no longer needed; all materials associated with the construction of the structure; backfilling and compacting the resulting excavation with Class II Granular Material and MDOT Open-Graded Aggregate 34R as shown in the plans; and, making the area ready for subsequent construction activities. Required castings for temporary drainage structures will be provided as directed by the Engineer and paid for separately.

In addition, payment for “Dr Structure, Manhole, Type III, \_\_\_ inch dia, with Custom Base” includes the entire structure, regardless of depth. Additional depth for these structures will not be paid for separately, but shall be included in the pay item “Dr Structure, Manhole, Type III, \_\_\_ inch dia, with Custom Base”.

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Payment for additional depth for drainage structures includes furnishing the labor, equipment, and materials for all necessary excavation, disposing of surplus excavated material, backfilling, and constructing the structure complete, including pipe connections and structure cleaning, for the portion of the structure which is deeper than 8 feet (including sump).

In addition to the above, payment for Dr Structure, Manhole, Type III, \_\_\_ inch dia, with Weir shall include all labor, equipment, and materials required to construct the weir, slide gate, and orifices as detailed on the plans.

Payment for adjusting of drainage structure covers shall be included in payment for the structure. Drainage structure covers will be paid for separately.

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**Description.-** This special provision establishes sampling and testing acceptance criteria for HMA Mixtures placed on City of Ann Arbor projects. The HMA mixtures shall meet all the requirements of Section 501 of the MDOT 2012 Standard Specifications for Construction, except as modified herein.

**a. Contractor Quality Control.-** The Contractor must have a quality control plan as required by Section 501.03.M and as stipulated herein. The Quality Control (QC) Plan shall be submitted to the Engineer within 30 days of contract award or 14 days before the placement of any HMA materials, whichever date comes first. The QC Plan shall cover all aspects of HMA production, transportation, placement, and compaction. The Contractor shall have a QC representative on-site at all times during the paving operations to monitor and direct all paving-related operations. The placement of HMA shall not commence until such time as the QC Plan has been accepted by the Engineer. The Engineer's acceptance of the QC Plan shall not be construed as a basis of acceptance of any HMA materials, HMA placement results, or a waiver of any requirement(s) of the project specifications.

**b. Materials.-** Aggregates, mineral filler (if required), and asphalt binder shall be combined as necessary to produce a mixture proportioned within the specification requirements including aggregate gradation; the mix design criteria including volumetric properties; the Superpave Gyrotory (SGC) compaction criteria; and the uniformity tolerances listed in Table 1. Topsoil, clay, or loam shall not be added to aggregates which are to be used in plant mixed HMA mixtures.

**c. Mix Designs.-** The Contractor shall submit mix designs for evaluation in accordance with the Michigan Department of Transportation Hot Mix Asphalt Production Manual. All mix designs shall be submitted for review a minimum of 3 weeks prior to the anticipated placement of the HMA. Do not begin production and placement of the HMA until receipt of the Engineer's approval of the JMF. The Contractor's production and paving schedules shall be considered to include the mix design review and approval process. Delays associated with the submittal, or re-submittal, of the required information shall not be a basis for an extension of contract time.

**d. Construction.-** Target air voids shall be 3.5% in leveling courses, top courses and shoulders paved in the same operation as the leveling and top courses. Target air voids shall be 3% in base courses and shoulders not paved in the same operation as the leveling and top courses. Pedestrian paths shall have a target air void content of 3%.

After the job-mix-formula (JMF) is established, the parameters identified in Table 1 shall be maintained within the Range 1 tolerance limits of Table 1. However, if deviations are predominately either below, or above, the JMF, the Engineer may order alterations in the plant to bring the mixture into better conformance with the JMF.

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The mixture will be considered out-of-specification, as determined by the acceptance tests, if for any one mixture, two consecutive tests per parameter (for Parameter 6, two consecutive aggregate gradations on one sieve) are outside Range 1 or Range 2 tolerance limits. If a parameter is outside of Range 1 tolerance limits and the second consecutive test shows that the parameter is outside of Range 2, then it will be considered to be a Range 1 out-of-specification. Consecutive refers to the production order and not necessarily the testing order. Out-of-specification mixtures are subject to rejection per Section f. Rejected Mixtures or a price adjustment per Section g. Price Adjustments of this special provision as determined by the Engineer.

Contractor paving operations will be suspended when the mixture is determined to be out-of-specification. Contract time will continue during periods when paving operations are suspended or when dispute resolution testing and investigations are occurring. The Engineer may issue a Notice of Non-Compliance with Contract Requirements (Form 1165), if the Contractor has not suspended operations and taken corrective action. The Contractor shall submit a revised JMF or proposed alterations to the plant and/or materials to achieve the JMF to the Engineer. Effects on the Aggregate Wear Index (AWI) and mix design properties shall be taken into consideration. Production and placement of HMA material shall not resume until receipt of the Engineer's approval to proceed.

For production/mainline-type paving, obtain the minimum number of samples as shown in Table 2, each being 20,000 grams, each day of production, for each mix type. The Engineer will sample the HMA and maintain possession of each sample. Sampling from the paver hopper is prohibited. Each sample will be divided into two 10,000 gram halves with one half being used for initial testing and the other half being held for possible dispute resolution testing. Obtain a minimum of three samples for each mix type regardless of the number of days of production.

Ensure all persons performing Quality Control (QC) and Quality Assurance (QA) HMA field sampling are "Local Agency HMA Sampling Qualified" samplers. The Engineer shall obtain the QA samples from the hauling units in accordance with *MTM 313 (Sampling HMA Paving Mixtures.)* The samples shall be representative of the day's paving. Sample collection shall be spaced throughout the planned tonnage as directed by the Engineer. At a minimum, one sample will be obtained in the first half of the planned tonnage and, as a minimum, the second sample will be obtained in the second half of the tonnage. If planned paving is reduced or suspended, when paving

resumes, the remaining sampling must be representative of the original intended sampling timing.

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Samples shall be taken from separate loads as directed by the Engineer.

Ensure all persons performing testing are Bit Level One certified or Bit QA/QC Technician certified. Acceptance testing will be performed by the Engineer using the testing method selected by the Engineer. Quality control measures to ensure job control are the sole responsibility of the Contractor.

The test method for measuring asphalt content (AC) shall be *MTM 325 (Quantitative Extraction of Bitumen from HMA Paving Mixtures)*. Back calculations to determine AC content will not be allowed.

All labs performing local agency acceptance testing shall be qualified labs as defined in the *HMA Production Manual* and participate in the MDOT round robin process, or they must be *AASHTO Materials Reference Laboratory (AMRL)* accredited for *AASHTO T 30* or *T 27*, and *AASHTO T 164* or *T 308*. Independent testing labs must not have conflicts of interest with the Contractor or Local Agency. On non-National Highway System (NHS) routes, Contractor labs may be used, but they must be qualified labs as previously stated. The Contractor shall provide copies of this documentation to the Engineer for review a minimum of 21 calendar days prior to the performance of any paving operations on the project.

Contractor labs may not be used for acceptance testing on NHS routes.

Material acceptance testing will be completed by the Engineer within 5 calendar days, except holidays and Sundays, after the Engineer has obtained the samples. QA test results will be provided to the Contractor after the Engineer receives the QC test results. Failure on the part of the Engineer or the laboratory to provide Quality Assurance test results within the specified time frame does not relieve the Contractor of their responsibility to provide an asphalt mix within specifications. The Contractor's schedule shall be deemed to include these material testing timeframes.

For production/mainline-type paving, the mixture may be accepted by visual inspection up to a quantity of 250 tons per mixture type, per project (not per day). For non-production-type paving defined as driveways, approaches, and patching, visual inspection may be allowed regardless of the tonnage.

The crushed particle content of the aggregate used in the HMA mixture shall not be more than 10 percentage points above or below the crushed particle content used in the JMF, nor less than the minimum specified for the aggregates in the contract documents.

Pavement density will be measured by the Engineer with a nuclear density gauge

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using the  $G_{mm}$  from the JMF for the density control target. The required in-place density of the HMA shall be between 92.0 and 96.0 percent of the density control target. The Contractor is responsible for establishing a rolling pattern that will achieve the required in-place density. Should the specified target densities not be met, the material shall be considered to have a Range 2 failure and shall be rejected. If the Engineer determines that the material is suitable to remain in place, a 50% reduction to the base price of all material affected shall be enacted by the Engineer. Should the Engineer determine that the material cannot remain in place, the affected material will be removed and replaced at the Contractor's sole expense as detailed in the Section f. "Rejected Mixtures."

After placement, roll the HMA mixture as soon after placement as the roller is able to bear without undue displacement or cracking. Start rolling longitudinally at the sides of the lanes and proceed toward the center of the pavement, overlapping on successive trips by at least half the width of the drum. Ensure each required roller is 8 tons minimum in weight unless otherwise approved by the Engineer.

Ensure the initial breakdown roller is capable of vibratory compaction and is a maximum of 500 feet behind the paving operations. The maximum allowable speed of each roller is 3 miles per hour (mph) or 4.5 feet per second. Ensure all compaction rollers complete a minimum of two complete rolling cycles prior to the mat temperature cooling to 180 degrees Fahrenheit (F). Continue finish rolling until all roller marks are eliminated and no further compaction is possible. The Engineer will verify and document that the roller pattern has been followed and density has been achieved. The Engineer can stop the placement of HMA when the roller pattern is not followed and density is not obtained. Contract time shall continue during this period and the Contractor shall be responsible for any additional costs incurred due to this work stoppage.

Pavement in-place density tests will be completed by the Engineer during paving operations and prior to traffic staging changes. Pavement in-place density acceptance testing will be completed by the Engineer prior to the Contractor being allowed to pave subsequent lifts of HMA or the newly placed HMA being opened to traffic.



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**HMA Acceptance Criteria**  
**Table 1 – Uniformity Tolerance Limits for HMA**  
**Mixtures**

Parameter		Top and Leveling Courses		Base Course	
		*Range 1	Range 2	*Range 1	Range 2
Number	Description				
1	Air Voids	$\pm 0.60$	$\pm 1.00$	$\pm 0.60$	$\pm 1.00$
2	VMA	$\pm 0.60$	$\pm 1.00$	$\pm 0.60$	$\pm 1.00$
3	G <sub>mm</sub> (maximum specific gravity of mixture)	$\pm 0.013$	$\pm 0.020$	$\pm 0.013$	$\pm 0.020$
4	Fines to Effective Binder Ratio (this parameter is independent of JMF)	0.6 to 1.2	0.6 to 1.4	0.6 to 1.2	0.6 to 1.4
5	Binder Content	$\pm 0.30$	$\pm 0.40$	$\pm 0.30$	$\pm 0.40$
6	Percent Passing No. 8 and Larger Sieves	$\pm 5.0$	$\pm 8.0$	$\pm 7.0$	$\pm 9.0$
	Percent Passing No. 30 Sieve	$\pm 4.0$	$\pm 6.0$	$\pm 6.0$	$\pm 9.0$
	Percent Passing No. 200 Sieve	$\pm 1.0$	$\pm 2.0$	$\pm 2.0$	$\pm 3.0$
7	Crushed Particle Content	Below 10%	Below 15%	Below 10%	Below 15%
*This range allows for normal mixture and testing variations. The mixture shall be proportioned to test as closely as possible to the Job-Mix-Formula.					

The tolerances specified in Table 1, with the exception of the Fines to Effective Binder Ratio, reflect variations from the approved job-mix formula.

Parameter Number 6 as shown in Table 1 is aggregate gradation. Each sieve will be evaluated on one of the three gradation tolerance categories. If more than one sieve

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is exceeding Range 1 or Range 2 tolerances, the sieve with the largest difference from the JMF will be counted as the gradation parameter. The master gradation should be maintained throughout production; however, price adjustments will be based on Table 1.

Extraction/gradation and volumetric tests will be performed by the Engineer to confirm conformance to the specifications and the tolerances identified in Table 1. The minimum number of samples to be obtained and tested shall be in accordance with Table 2.

**Table 2 – Minimum Number of Samples**

Quantity (tons) of Single Mixture Placed per Day	Minimum Number of Samples per Mixture per Day
<100	0
101 – 250	1
251 – 1,500	3
1,501 – 3,000	5
3,001 – 4,500	as directed by the Engineer

**e. Rejected Mixtures.-** If, for any one mixture, two consecutive tests per parameter (for Parameter 6, two consecutive aggregate gradations on one sieve) are outside Range 1 or Range 2 tolerance limits the mixture is considered out-of- specification and will be rejected. If a parameter is outside of Range 1 tolerance limits and the second consecutive test shows that the parameter is outside of Range 2, then it will be considered to be a Range 1 out-of-specification. If, for any one mixture, two consecutive tests do not meet the minimum requirements for crushed particle content specified in the project documents, the portion of the mixture with insufficient crushed particle content will be considered out-of-specification and will be rejected.

The quantity of material to be rejected is defined as the material produced from the time the first out-of-specification sample was taken until the time the sample leading to the first in-specification test was taken.

If out-of-specification mixtures are placed in a pavement, the Contractor has 4 calendar days from receipt of the acceptance test results to notify the Engineer, in writing, that dispute resolution testing is requested. The Contractor’s QC test results for the corresponding QA test results must result in an overall payment greater than QA test results, otherwise the QA tests will not be allowed to be disputed. The Engineer has

4 calendar days to send the dispute resolution sample to the MDOT Central Laboratory once dispute resolution testing is requested. The remaining 10,000 gram portion of the field samples (split samples) will be sent to the Central Laboratory to complete all Dispute Resolution testing and return test results to the Engineer, who will provide them to the

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Contractor, within 13 calendar days upon receiving the Dispute Resolution samples. The Contractor may only take pavement cores if approved in writing by the Engineer. If the Central Laboratory test results do not confirm the original field test results, then no price adjustments will be made for the mixture involved.

If the Central Laboratory test results confirm the original test results and, if in the Engineer's judgment, the mixture warrants removal, the Contractor shall remove and replace the rejected (out-of-specification) mixture, at the Contractor's expense, with a mixture meeting the specification requirements. These costs shall be deemed to include all costs associated with the material removal and replacement including, but not limited to; costs associated with re-mobilization of labor and equipment; traffic control; removal and disposal of the rejected material; transportation costs to provide material meeting the requirements of the specification; and, any other cost associated with the work. Contract time shall continue during the period of time that the rejected material is investigated and re-tested, as well as, during the removal and replacement operations.

If the Central Laboratory test results confirm the original test results and, if in the Engineer's judgment, the mixture can remain in place, the base and/or unit price for the rejected (out-of-specification) mixture will be decreased as described in the Section g., "Price Adjustments."

If no field extractions are performed on a given day because the quantity being placed is less than 100 tons, and if there is reason to believe that the mixture contains material parameters that exceed Range 2 tolerances, or if the crushed particle content is less than the established criteria, a price adjustment may also be applied, or removal may be required, based on extraction, gradation, and volumetric tests performed by the Engineer from pavement cores following the procedures outlined herein.

**f. Price Adjustments.-** Base Price. Price established by the Department to be used in calculating incentives and adjustments to pay items and shown in the contract.

Price adjustments for either Range 1 and/or Range 2 failures shall be made to the base and/or unit price of HMA material in accordance with the procedures outlined in the Special Provision 12TM501(A335) entitled "Hot Mix Asphalt Prices for Adjustments" for mixtures with failing test parameters.

The quantity of material receiving a price adjustment is defined as the material produced from the time the first out-of-specification sample was taken until the time the sample leading to the first in-specification test was taken.

The price adjustments will be determined by the Engineer from the combination of

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sample test result parameters of the out-of-specification (rejected) material that create the largest total price adjustment for the material. The price adjustments shall be determined based on Tables 3 and 4. The Engineer is not obligated to accept a price adjustment for out-of-specification (rejected) material that exceeds Range 2 limits in lieu of requiring the material to be removed and replaced at the Contractor’s expense in accordance with Section f., Rejected Mixtures.

In all cases, when penalties are assessed, the penalty applies to each parameter, up to two parameters, that is out of specification.

**Table 3: Penalty Per Parameter**

Mixture Parameter out-of-Specification per Acceptance Tests	Mixture Parameter out-of-Specification per Dispute Resolution Test Lab	Price Adjustment per Parameter
NO	N/A	None
YES	NO	None
	YES	Outside Range 1 but not Range 2: decrease by 10%
		Outside Range 2: decrease by 25%

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**Table 4**  
**Calculating Total Price Adjustment**

Cost Adjustment as a Sum of the Highest Parameter Penalties		
Number of Samples with Parameters Out-of-Specification	Range(s) Outside of Tolerance Limits of Table 1 per Parameter	Total Price Adjustment
One	Range 1	10%
	Range 2	25%
Two	Range 1 & Range 1	20%
	Range 1 & Range 2	35%
	Range 2 & Range 2	50%
Three or more	Range 1, Range 1 & Range 1	20%
	Range 1, Range 1 & Range 2	35%
	Range 1, Range 2 & Range 2	50%
	Range 2, Range 2 & Range 2	50%

Each parameter of Table 1 is evaluated with the total price adjustment applied to the base and/or unit price based on a sum of the two parameter penalties resulting in the highest total price adjustment in accordance with Table 4. For example, if three parameters are out-of-specification, with two parameters outside Range 1 of Table 1 tolerance limits, but within Range 2 of Table 1 limits and one parameter outside of Range 2 of Table 1 tolerance limits and the Engineer approves leaving the mixture in place, the total price adjustment for that quantity of material is 35 percent.

If acceptance tests, as described in Section e. of this special provision, show that a Table 1 mixture parameter exceeds the Range 1, but not the Range 2, tolerance limits, that mixture parameter will be subject to a 10 percent penalty. The 10 percent penalty will be assessed based on the acceptance tests only unless the Contractor requests that the 10,000 gram sample part retained for possible dispute resolution testing be tested. The Contractor has 4 calendar days from receipt of the acceptance test results to notify the Engineer, in writing, that dispute resolution testing is requested. The Contractor's QC test results for the corresponding QA test results must result in an overall payment greater than QA test results, otherwise the QA tests will not be allowed to be disputed. The Engineer has 4 calendar days to send the dispute resolution sample to the MDOT Central Laboratory and the resultant dispute test results will be used to determine the penalty per parameter, if any. If the dispute testing results show that the mixture parameter is out-of-specification, the Contractor will pay for the cost of the dispute resolution testing and the contract unit and/or base price for the material will be adjusted, based on all test result parameters from the dispute tests, as shown in Table 3 and Table 4.

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If the dispute test results do not confirm the mixture parameter is out-of- specification, then the Local Agency will pay for the cost of the dispute resolution testing and no price adjustment is required.

If acceptance tests, as described in section e. of this special provision, show that a Table 1 mixture parameter exceeds the Range 2 tolerance limits, the 10,000 gram sample part retained for possible dispute resolution testing will be sent, within 4 calendar days, to the MDOT Central Laboratory for further testing. The MDOT Central Laboratory's test results will be used to determine the penalty per mixture parameter, if any. If the MDOT Central Laboratory's results do not confirm the mixture parameter is out-of-specification, then no price adjustment is required. If the MDOT Central Laboratory's results show that the mixture is out-of-specification, and the Engineer approves leaving the out-of-specification mixture in place, the contract unit and/or base price for the material will be adjusted, based on all parameters, as shown in Table 3 and Table 4.

In the case that the Contractor disputes the results of the test of the second sample obtained for a particular day of production, the test turn-around time frames given would apply to the second test and there would be no time frame on the first test.

**g. Measurement and Payment.-** The completed work, as described herein, will be measured and paid for using applicable pay items as described in subsection 501.04 of the Standard Specifications for Construction, or the contract, except as modified in Section g. Price Adjustments.

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**a. Description.-** Hot Mix Asphalt (HMA) pavement base, leveling, and top courses shall be constructed in accordance with Section 501 of the 2012 MDOT Standard Specifications for Construction, except as modified herein, and as directed by the Engineer.

**b. Construction Methods.-**

**Equipment-** All equipment shall conform to Section 501.03.A of the 2012 MDOT Standard Specifications, except as modified herein.

The Contractor shall have a 10 foot long straight edge, rubber-tired backhoe (Case 580 type, or equivalent), air-compressor with the ability to develop a minimum pressure of 100 pounds per square inch and continuous rated capacity of 150 cubic feet per minute of air flow, and jackhammer available during all paving operations. The Contractor shall be required to perform any miscellaneous cleaning, trimming, material removal, and other tasks as required by the Engineer in order to ensure the proper and orderly placement of all HMA materials on this project.

The Contractor shall provide sufficient rollers to achieve the specified asphalt densities.

At various times throughout the work, the Engineer may direct the Contractor to use smaller and/or lighter equipment, and to defer certain work tasks, in order to protect the grade and/or adjacent areas; including hauling units. The Contractor shall not be entitled to any additional compensation for the use of smaller equipment, lighter equipment, or work task deferral.

**Cleaning and Bond Coat application-** Cleaning and bond coat application shall be performed in accordance with Sections 501.03.C and 501.03.D of the 2012 MDOT Standard Specifications, except as modified herein, and as directed by the Engineer.

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, and when directed by the Engineer, 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. The vac-all or similar equipment and shall be approved by the Engineer prior to beginning the work.

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The equipment used shall have an effective means for preventing any dust resulting from the operation from escaping into the air.

The bond coat shall be applied at a minimum rate of 0.10 gallons/yd<sup>2</sup>. Before placing the bond coat, the existing pavement surface shall be thoroughly cleaned. The Contractor shall also thoroughly clean all joints, cracks, and edges to a minimum depth of one inch with compressed air, vac-all type equipment, or other approved mechanical or hand methods, to remove all dirt, debris, and all foreign material.

**HMA Placement-** Placement shall conform to Section 501.03.F of the 2012 MDOT Standard Specifications, except as modified herein, and as directed by the Engineer.

HMA placement shall not commence until a "Permit to Place" (no additional costs are required to obtain this permit) has been issued in writing by the Engineer. The Permit to Place shall be issued after the aggregate base course or the adjacent, underlying layer of pavement section has been approved by the Engineer.

The final structure adjustments must be approved by the Engineer prior to the issuance of the "Permit to Place" for the wearing course.

The top course shall be placed with a ¼" lip at the gutter edge of metal.

All HMA thickness dimensions are compacted-in-place.

**Paving Operation Scheduling** – The Contractor shall schedule the paving operation to avoid longitudinal cold joints that would be required to be left "open" over night.

In all cases, the Contractor shall pave the primary road's through-traffic lanes ("main line") first, from point-of-beginning to the point-of-ending. All other paving including, but not limited to; acceleration and deceleration lanes, intersection approaches, and center left-turn lanes shall be paved following completion of main line paving, unless authorized by the Engineer prior to the placement of any pavement.

**Rate of Paver operation** - The rate of the paver's travel shall be maintained such that the paving operation will be continuous, resulting in no transverse cold joints, but shall never exceed the rate of 50 feet per minute.



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 DETAILED SPECIFICATION  
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The Contractor shall furnish and operate enough material, equipment, and hauling units so as to keep the paving machine(s) moving continuously at all times. Failure to do so shall be cause for the suspension of the paving operation until the Contractor can demonstrate to the satisfaction of the Engineer, that sufficient resources have been dedicated to perform the work in accordance with the project specifications.

**Longitudinal and Transverse Joints-** shall conform to Section 502.03.F of the 2012 MDOT Standard Specifications and as specified herein.

For mainline HMA paving, the width of the mat for each pass of the paver shall be not less than 10.5', nor greater than 15', except as noted in the plans and as directed by the Engineer. The Engineer will direct the layout of all HMA longitudinal joints during construction.

Prior to placing the adjacent paving pass on the leveling and wearing courses of HMA, the Contractor shall cut and remove 6" to 8" of the previously placed pavement at the free edge of the pavement by means of a coultter wheel. The Engineer reserves the right to reject any method(s) for cutting the pavement that does not provide a vertical and satisfactory edge, free of tearing, bending, or other deformations, as determined by the Engineer. Any method(s) employed by the Contractor shall be completely effective. The cut edge shall have a uniform bead of pavement joint adhesive applied to the full-height of the joint. The removal of this HMA material and resulting edge must be approved by the Engineer prior to proceeding with the placement of the succeeding pass of HMA. The base course of HMA and its vertical edge will have bond coat applied in accordance with Section 501.03.D. All costs associated with complying with these requirements will not be paid for separately, but shall be considered to be included in the items of work "HMA, \_\_\_" or "HMA, Approach."

Pavement joint adhesive shall be hot-applied, meet, or exceed, the following properties, and be approved by the Engineer prior to performing HMA placement:

Brookfield Viscosity, 400°F, ASTM D2669 – 4,000 to 10,000 cp  
 Cone Penetration, 77°F, ASTM D5329 – 60 to 100  
 Flow, 140°F, ASTM D5329 – 5mm maximum  
 Resilience, 77°F, ASTM D5329 – 30% minimum  
 Ductility, 77°F, ASTM D113 – 30 cm minimum  
 Ductility, 39.2°F, ASTM D113 – 30 cm minimum  
 Tensile Adhesion, 77°F, ASTM D5329 – 500% minimum  
 Softening Point, ASTM D36 - 170°F minimum  
 Asphalt Compatibility, ASTM D5329 – pass

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FOR  
**HMA PAVING, CITY OF ANN ARBOR**

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**Feather Joints** – shall be constructed so as to vary the thickness of the HMA from zero inches to the required paving thickness at the rate of approximately 1.5” over a distance of 10 feet, or as directed by the Engineer. The Contractor shall rake the larger pieces of aggregate out of feather joints prior to compaction.

**Butt Joints** - Construction of butt joints, where directed by the Engineer, shall conform to Section 501.03.C.3 and 501.03.C.4 of the 2012 MDOT Standard Specifications, except as modified herein.

When a butt joint is specified or directed to be placed by the Engineer, remove the existing HMA surface to the thickness of the proposed overlay, or full-depth, as directed by the Engineer, for the full width or length of the joint. The HMA material shall be sawcut to the directed depth along the pavement edge or removal line to prevent tearing of the pavement surface. Cut joints that will be exposed in the completed surface must be cut with a saw or a cold-milling machine or other methods approved by the Engineer. Joints that will be covered by HMA must be cut with a saw, a cold-milling machine, or other methods approved by the Engineer.

**Rakers**- the Contractor shall provide a minimum of two rakers during the placement of all wearing and leveling courses.

**Faulty Mixtures** – The Contractor and Engineer shall carefully observe the paving operation for signs of faulty mixtures. Points of weakness in the surface shall be removed or corrected by the Contractor, at his/her sole expense, prior to paving subsequent lifts of bituminous material. Such corrective action may include the removal and replacement of thin or contaminated sections of pavement, segregated HMA, and any sections that are weak or unstable. Once the Contractor or his representative is notified by the Engineer that the material being placed is out of allowable tolerances, or that there is a problem with the paving operation, the Contractor shall stop the paving operation at once, and shall not be permitted to continue placing bituminous material until again authorized by the Engineer. Any costs associated with meeting the requirements specified herein shall not be paid for separately, but shall be included in the item(s) of work being performed at the time the faulty mixture was discovered.

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**c. Measurement and Payment.-** Unused HMA remaining in trucks after the work is completed shall be returned to the plant and re-weighed, and the corrected weight slip shall be provided to the Engineer. No payment will be made for the unused HMA material. All weight slips must include the type of mixture (codes are not acceptable), as well as vehicle number, gross weight, tare weight and net weight.

All costs of meeting the requirements of this special provision shall be included in the bid prices for HMA items in the proposal and will not be paid for separately.

CITY OF ANN ARBOR  
 DETAILED SPECIFICATION  
 FOR  
**HMA APPLICATION ESTIMATE**

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**a. Description.-** The work shall be performed in accordance with the requirements of Division 5 of the 2012 Michigan Department of Transportation Standard Specifications for Construction, and as herein specified.

**b. Materials.**

STREET NAME	PAY ITEM	HMA MIX	APPLICATION RATE	EST. THICKNESS	PERFORMANCE GRADE	AWI (min)
Fuller Street Glen Court	HMA, 5E3	5E3 (top)	220 lb/Syd	2.0"	PG 58-28	260
	HMA, 4E3	4E3 (level)	220 lb/Syd	2.0"	PG 58-28	
	HMA, 3E3	3E3 (base)	330 lb/syd	3.0"	PG 58-28	

The Performance Grade asphalt binder range for the HMA mixture shall be as noted above.

The Bond Coat material shall be applied in accordance with the requirements of the Special Provision entitled "HMA Paving, City of Ann Arbor." The uniform rate of application shall be a minimum of 0.10 gallons/yd<sup>2</sup> and be approved by the Engineer. This work will not be paid for separately, but shall be included in the cost of other pay items.

**c. Measurement and Payment.-** The work shall be measured and paid for as provided elsewhere in the contract documents.

CONCRETE PLACEMENT AND PROTECTION 601B

CITY OF ANN ARBOR  
DETAILED SPECIFICATION  
FOR  
CONCRETE PLACEMENT AND PROTECTION

AA:MGN

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**a. Description.-** This work shall consist of furnishing all labor, material, and equipment needed to furnish, place, and protect all concrete material in accordance with the requirements of this Special Provision. These requirements shall not apply to concrete bridge decks, unless otherwise noted.

**b. Materials.-** The Concrete shall meet the requirements of Sections 601 and 701 of the 2012 Michigan Department of Transportation Standard Specifications for Construction.

The Contractor shall propose specific concrete mix designs for the intended project purpose in accordance with the requirements of this Special Provision and other applicable Special Provisions and/or project requirements. The Engineer's acceptance of a mix design shall not relieve the Contractor of their responsibility for the manufacture of the concrete mixture(s), its placement, or performance.

**c. Construction Methods.-** The Contractor shall perform all concrete placement operations in weather that is suitable for the successful placement and curing of the concrete materials. Concrete shall not be placed during periods of active precipitation.

The Contractor shall complete all needed formwork, base and/or sub-base preparation, and any other related items that are deemed necessary for the proper completion of the work. The Contractor shall not commence the placement of concrete until they receive all needed approvals from the Engineer for placement. The Engineer's approval of the Contractor to place concrete shall not relieve the Contractor of their responsibility for the proper placement and protection of the concrete materials or its long-term performance.

During periods when precipitation is threatening, provide durable, plastic sheeting, approved by the Engineer, in sufficient quantity to cover and protect all freshly placed concrete such that precipitation does not come into contact with the concrete. The Contractor shall arrange the placement of the plastic sheeting such that the surface of any freshly placed concrete is not marred by contact with the plastic; any seams in the plastic sheeting shall be water tight. The Contractor shall place adequate supports along and over the freshly placed concrete to prevent contact of the plastic and concrete. The Contractor shall ensure that sufficient dams or barriers are placed along the edges of the freshly placed concrete to prevent erosion of the underlying materials or damage to the edges of the freshly placed concrete. All measures shall be effective.

## CONCRETE PLACEMENT AND PROTECTION 601B

### CITY OF ANN ARBOR DETAILED SPECIFICATION FOR CONCRETE PLACEMENT AND PROTECTION

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Any concrete damaged by precipitation shall be removed and replaced at the Contractor's expense. The Engineer shall decide if the concrete has been damaged and the limits of removal and replacement.

Concrete shall only be placed when the rate of surface evaporation at the site is less than 0.20 pounds per square foot per hour, according to Figure 706-1 of the 2012 Michigan Department of Transportation Standard Specifications for Construction. The Contractor shall provide approved equipment for determining the relative humidity and wind velocity at the site.

Water shall not be added to the placed concrete in order to aid finishing. Any water added to the concrete for slump adjustments shall be done by adding water to the mixing unit and thoroughly re-mixing the concrete for 30 revolutions of the mixing unit at mixing speed. Water shall not be added such that the design water-to-cement ratio of the concrete mixture or the design slump of the concrete mix is exceeded.

Concrete curing shall be performed in accordance with Section 602.03.M of the 2012 MDOT Standard Specifications for Construction. Curing operations shall take precedence over texturing operations and continued concrete placement. All curing compound applied shall provide uniform coverage over the entire surface being protected. The placement of curing compound shall be free of spots, blotches, or uncovered or non-uniformly covered areas. Should any areas be determined to exist by the Engineer, the curing compound shall be immediately re-applied by the Contractor at no additional cost to the project.

**d. Weather Limitations.-** The Contractor shall take all precautions when placing concrete to protect it from damage due to the elements. Concrete shall not be placed during precipitation events.

Concrete shall be protected from weather and temperature according to the requirements of Section 602.03.T. Concrete shall not be placed when the temperature of the plastic concrete mixture itself is greater than 90° F. In conditions where low temperature protection is required, the Contractor shall cover the concrete with insulated blankets, or other means as approved by the Engineer, to protect the concrete from damage. The concrete shall remain protected until it has reached a compressive strength of at least 1000 psi, or as directed by the Engineer.

CONCRETE PLACEMENT AND PROTECTION 601B

CITY OF ANN ARBOR  
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FOR  
CONCRETE PLACEMENT AND PROTECTION

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**e. Protection of Concrete from Construction Traffic, Vandalism and Graffiti.-**

The Contractor shall take all needed precautions to protect any concrete placed from being damaged by foot traffic, vehicular traffic, Contractor's equipment and personnel, subsequent construction operations, vandalism, and the like.

The Contractor shall provide sufficient personnel to guard and protect newly placed concrete until such time as it has hardened sufficiently to prevent damage. Any concrete curing compound damaged by Contractor foot traffic or equipment shall be immediately recoated by the Contractor at the Engineer's request.

Any concrete which is marked by graffiti, cracks other than at joints, or otherwise damaged before it has sufficiently hardened to prevent damage shall be removed and replaced in accordance with the appropriate project specifications at the Contractor's sole expense.

**f. Measurement and Payment.-** All costs associated with the conformance to the requirements of this Special Provision will not be paid for separately, but shall be considered to be included in the respective items of work.

DETAILED SPECIFICATION  
FOR  
**EXPANSIVE WATERSTOP**

C&T:JFS/AA:MGN

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C&T:APPR:JAB:TES:01-11-12  
12/17/18

**a. Description.** This work consists of the installation of expansive waterstops to be used for cast-in-place watertight seals at construction joints in Portland cement concrete structure applications as specified on the plans. The standard specifications apply except as modified herein.

**b. Materials.** Provide one of the following expansive bentonite/butyl rubber-based waterstop or expansive butyl rubber waterstop systems:

Volclay Waterstop – RX101T

Greenstreak Swellstop

Hydro-flex Waterstop

Do not allow the waterstop materials to come in contact with water at any time prior to concrete placement. Do not use waterstop materials that are damaged, deformed, or exhibit volumetric expansion due to moisture.

**c. Construction.** Install the waterstop at locations as shown on the plans. Provide a minimum of 4 inches of concrete cover from the edge of the waterstop to the exposed face of finished concrete.

Clean and dry all surfaces to receive waterstop materials. Remove curing compound, oils, grease, and other debris prior to application of adhesives or primers. Remove surface imperfections, excluding tining, prior to application of adhesives or primers.

Install the expansive waterstop systems in accordance with the manufacturer's installation procedures/guidelines. Provide the installation procedures/guidelines to the Engineer prior to installation.

Place and consolidate the concrete so as to prevent damage or dislocation of the waterstop from the substrate concrete surface.

**d. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

<b>Pay Item</b>	<b>Pay Unit</b>
Expansive Waterstop .....	Foot

**Expansive Waterstop** includes all labor, equipment, and materials required to prepare the



substrate concrete surface and install the waterstop according to this special provision.

Measurement of **Expansive Waterstop** is based on the actual length of installed waterstop material, with no additional compensation for surplus materials. Payment for the adhesive and/or primer is included in the pay item for **Expansive Waterstop**, with no additional compensation allowed.

CITY OF ANN ARBOR  
 DETAILED SPECIFICATION  
 FOR  
**MISCELLANEOUS METAL WORK**

FTCH:KAP/AA:MGN

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01/24/19

**a. Description.** This work consists of designing, furnishing, and installing miscellaneous metal work as indicated on the plans, as detailed in this specification, and as directed by the Engineer. Also included is all work as required for the proper installation of these items. Complete this work in accordance with Section 707 of the 2012 MDOT Standard Specifications for Construction and this detailed specification.

**b. Materials.** Provide materials meeting the requirements specified in the following sections of the Standard Specifications for Construction.

Grout, Type H-1 .....	702
Miscellaneous Metal Products .....	908
Stainless Steel .....	ASTM A267 316L and/or F593/594
Neoprene .....	ASTM D2000, Grade 1BE625
Ultra High Molecular Weight Polymer .....	ASTM D4020

**Fabricated Stainless Steel Gate**

Fabricated stainless steel slide gate as manufactured by Hydro Gate or Engineer-approved equal. Slide shall be fabricated from Type 316L stainless steel plate with ¼ inch minimum thickness and reinforced as necessary to prevent deflection. Provide two slides designed for a gate with an effective opening of 28 inches wide by 46 inches tall. One slide shall be provided with a 21-inch diameter orifice as indicated on drawings. One blank slide shall be provided with no orifice. Both slides shall have a ¾ inch diameter hole centered at the top of the slide for use with a lifting shackle. Provide 316 stainless steel 5/8-inch lifting shackle and ¼-inch stainless steel, single leg, wire rope sling, 16-feet in length. Slide gate and accessories shall be provided by the Contractor.

Guide frame shall be fabricated of 316L stainless steel with a height as indicated on the drawings. Bottom shall be flush invert with neoprene seal. Vertical frame members shall include integral UHMW Ploy-Liner wear strips with J-seal neoprene retainer.

Fasteners include anchor bolts, assembly bolts, and nuts provided by the gate manufacturer. Fasteners shall be ASTM F593 316 stainless steel of ample size to safely withstand forces created during gate operation.

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DETAILED SPECIFICATION  
FOR  
**MISCELLANEOUS METAL WORK**

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Fabricated Weir Plate Assembly

Weir plate shall be 316L stainless steel with dimension of 99 inches wide by 20 inches tall. Provide a 2" x 2" x 3/16" 316L stainless steel angle fully welded along top edge of the plate as shown on drawings.

Concrete inserts shall be Unistrut Concrete Inserts – Series 3200 or Engineer-approved equal. Concrete inserts to be cast integrally in concrete wall as shown on drawings.

Fasteners include 316 stainless steel spring nuts and 316 stainless steel ¼-inch thick heavy-duty Z beam clamps.

**c. Shop Drawings.-** The Contractor shall submit drawings detailing fabrication and installation of the miscellaneous metal elements

The Contractor shall submit to the Engineer detailed plans, calculations and descriptions of the proposed fabricated metal elements in accordance with Section 104.02 of the Michigan Department of Transportation 2012 Standard Specifications for Construction.

For each submittal or resubmittal, the Contractor shall allow at least 15 calendar days from the date of the submittal to receive the Engineer's acceptance or request for revisions. The Engineer's comments shall be incorporated into the submitted plans, calculations and descriptions. The Engineer's acceptance is required before beginning the work. Resubmittals may take less than 15 calendar days depending upon the magnitude of revisions requested. Required revisions will not be a basis of payment for additional compensation, extra work, or an extension of contract time. The Contractor shall include time for this entire review process in his/her CPM network schedule.

Electronically submit shop drawings and product data to the Engineer for review in portable document format (PDF). Do not use these materials in the work until approved by the Engineer. Submittals will be returned in 15 working days. Electronically submit the following information for approval by the Engineer.

Provide catalog cuts for standard manufactured items and mill reports covering chemical and physical properties. Ensure each sheet identifies the exact equipment for which it is intended. Ensure all pertinent information such as physical dimensions and approved listings or testing agencies is provided.

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MISCELLANEOUS METAL WORK

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Provide shop drawings showing layout, fabrication dimensions, welded and bolted connection details, anchoring details, and erection information. Include pull out and shear strength information for recommended anchor bolts.

The approval of shop drawings does not relieve the Contractor from the responsibility to correct errors or omissions or to provide adequate field measurements as may be required. It is the Contractors responsibility to call attention to all deviations from the plans, specifications and details. If deviations have not been clearly identified, they will not be considered as part of the shop drawing approval.

**d. Construction.** Construct in accordance with Sections 707 of the Standard Specifications for Construction, as shown on the plans, and as modified herein. Install miscellaneous metals as shown on the plans, in conformance with accepted shop drawings, and the manufacturer’s recommendations.

**e. Measurement and Payment.** The completed work, as described, will be measured as a lump sum and paid for at the contract price using the following pay item:

<u>Pay Item</u>	<u>Pay Unit</u>
Miscellaneous Metal Work.....	Lump Sum

The work of this item includes furnishing of the required shop plans; furnishing and installation of stainless steel slide gates and gate guide frames and fasteners; furnishing and installation of the weir plate, weir plate inserts and fasteners; and, furnishing and installation of all other miscellaneous metal work materials. The work of this item shall also include the forming, furnishing of all materials, removal of the forming materials when no longer needed, and labor associated with grouting these items in their final location as shown on the shop plans and as detailed herein.

CONCRETE CURB AND DRIVEWAY OPENINGS 802

CITY OF ANN ARBOR  
SPECIAL PROVISION  
FOR  
CONCRETE CURB AND DRIVEWAY OPENINGS

FTCH:KAP/AA:MGN

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12/21/18

**a. Description.-** This work shall consist of constructing concrete curb and gutter, and concrete curb openings in accordance with Section 802 of the MDOT 2012 Standard Specifications for Construction, as shown on the plans, and as specified herein.

**b. Materials.-** The materials shall meet the requirements as specified in Section 802.02 of the 2012 MDOT Standard Specifications and as specified herein:

Concrete curb and gutter specified herein shall be grade P1 with 6AA coarse aggregate. The Contractor may elect to add GGBFS to P1 mixtures in accordance with the requirements of the contract documents. No additional payment will be made for concrete mixtures containing GGBFS.

All concrete mixtures shall contain 6AA coarse aggregates which are either natural or limestone and meet the requirements of Section 902.

It shall be the Contractor's sole responsibility to propose specific concrete mix designs which meet the requirements of this Special Provision and the contract documents.

**c. Construction Methods.-** Curb and Gutter, Conc, Det F4, Special and Curb and Gutter, Conc, Det F6 shall be constructed as shown in the MDOT Standard Plans R-30 series, as detailed in this specification, and as shown in the plans.

Expansion joints of the thickness shown on the details shall be placed as directed by the Engineer.

The preparation of the aggregate base course upon which the curb and gutter and drive openings are to be constructed shall be performed in accordance with the Special Provision entitled "Subbase, CIP, \_\_\_\_, Modified" and "Aggregate Base, 21AA, Modified".

The concrete curb and gutter shall not be constructed on a pedestal or a mound. The aggregate base course shall be constructed the full width of the stage or phase in which concrete curb and gutter or driveway opening is to be constructed.

The concrete items being placed shall not be opened to construction or vehicular traffic until such time as the concrete has reached the required flexural strength. The Contractor shall cast beams in accordance with Section 603.03.B.10, and as approved by the Engineer, and obtain concrete flexural strength in accordance with the requirements of Section 104.11, Table 104-2. Beams cast for open to traffic

CONCRETE CURB AND DRIVEWAY OPENINGS 802

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determinations shall be cured in the same manner and environment as the concrete items which they represent.

Flexural strength beams shall be tested (broken) with a device meeting the approval of the Engineer and be in a state of good repair and shall be calibrated by an accredited testing laboratory or engineering company within a period of two years from the date of the test being performed.

**d. Measurement and Payment.**- The completed work as measured shall be paid for at the contract unit price for the following contract items (pay items):

<u>Contract Item (Pay Item)</u>	<u>Pay Unit</u>
Curb and Gutter, Conc, Det F4, Special.....	Foot

The pay items will be measured in length by the foot and will be payment in full for all labor, equipment and material needed to properly complete this work.

At curb openings for sidewalk ramps, the concrete curb and gutter (without the curb face) will be measured and paid for at the contact unit price for curb and gutter.

Where the Engineer directs the use of high early strength concrete for pay items that are not designated as "P-NC," the additional cement shall be paid for separately. No additional payment will be made for cement for pay items that are designated "P-NC."

COONCRETE SIDEWALK, ADA RAMPS, AND DRIVEWAY APPROACHES 803A

CITY OF ANN ARBOR  
SPECIAL PROVISION  
FOR  
CONCRETE SIDEWALK, ADA RAMPS, AND DRIVEWAY APPROACHES

FTCH:KAP/AA:MGN

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**a. Description.-** This work shall consist of constructing concrete sidewalk, ramp, or drive approaches of the types as indicated on the plan sheets, as detailed in the specifications, or as directed by the Engineer. It shall also include constructing concrete drive approaches of the types as indicated on the plan sheets, as detailed in the specifications, or as directed by the Engineer. All work shall be in accordance with Section 801 and 803 of the 2012 MDOT Standard Specifications for Construction and as specified herein.

**b. Materials.-** The materials shall meet the requirements as specified in the 2012 MDOT Standard Specifications and as required herein. The grade of concrete for items designated as "P-NC" shall be Grade P-NC concrete (658 lbs/yd<sup>3</sup> cement content) as specified in Section 601 of the 2012 MDOT Standard Specifications.

The grade of concrete for all remaining items covered by this Special Provision shall be grade P1 as specified in Section 601 of the 2012 MDOT Standard Specifications for Construction. The Contractor may elect to add GGBFS to P1 mixtures in accordance with the requirements of the contract documents. No additional payment will be made for concrete mixtures containing GGBFS.

All concrete mixtures shall contain 6AA coarse aggregates which are either natural or limestone and meet the requirements of Section 902 of the 2012 Michigan Department of Transportation Standard Specifications for Construction.

It shall be the Contractor's sole responsibility to propose specific concrete mix designs which meet the requirements of this Special Provision.

**c. Construction Methods.-** The Contractor is responsible to construct all sidewalk and all other concrete items within ADAAG compliance. All sidewalk must be constructed in accordance with MDOT Standard Detail R-28-I (or the version in effect at the time of Bid Letting.)

Where concrete sidewalk is to be placed, they shall be placed on a minimum of 4 inches of Granular Material, Class II, compacted to 95% of its maximum dry density.

Prior to placing any concrete, the subgrade shall be completed and trimmed to final elevation. If a cold joint is required, the existing concrete is to be cleaned with compressed air to expose the aggregate in the concrete.

COONCRETE SIDEWALK, ADA RAMPS, AND DRIVEWAY APPROACHES 803A

CITY OF ANN ARBOR  
SPECIAL PROVISION  
FOR  
CONCRETE SIDEWALK, ADA RAMPS, AND DRIVEWAY APPROACHES

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The concrete items being placed shall not be opened to construction or vehicular traffic until such time as the concrete has reached the required flexural strength. The Contractor shall cast beams in accordance with Section 603.03.B.10, and as approved by the Engineer, and obtain concrete flexural strength in accordance with the requirements of Section 104.11, Table 104-2. Beams cast for open to traffic determinations shall be cured in the same manner and environment as the concrete items which they represent.

Flexural strength beams shall be tested (broken) with a device meeting the approval of the Engineer and be in a state of good repair and shall be calibrated by an accredited testing laboratory or engineering company within a period of two years from the date of the test being performed.

**d. Measurement and Payment.-** The completed work as measured for the following pay items will be paid for at the contract unit prices for the following contract items (pay items):

<u>Contract Item (Pay Item)</u>	<u>Pay Unit</u>
Sidewalk, Concrete, ___ inch, Special .....	Square Foot

The above items will be measured by area in square feet and be paid for at their respective contract unit price, which price shall be payment in full for all labor, equipment and material needed to accomplish this work.

Where the Engineer directs the use of high early concrete for pay items that are not designated as "P-NC," the additional cement shall be paid for separately. No additional payment will be made for cement for pay items that are designated "P-NC."

Excavation for placement of Granular Material, Class II, bedding material shall be included in the item of work " Sidewalk, Concrete, \_\_\_ inch, Special" and shall not be paid for separately.



DETAILED SPECIFICATION  
FOR  
**RECESSED PAVEMENT MARKINGS**

PMK:MKB/AA:MGN

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APPR:MWB:MB:02-08-18

FHWA:APPR:02-20-18

12/17/18

**a. Description.** This work consists of providing all equipment and labor required to prepare (grooving) the pavement surface for recessed longitudinal, transverse, and turning guide line pavement markings in accordance with section 811 of the Standard Specifications for Construction, the plans, and this special provision.

**b. Materials.** None specified.

**c. Construction.** Install a recess (groove) in accordance with the pavement marking material manufacturer's installation instructions. Ensure all recessing configurations are in accordance with the *MMUTCD* and the Department Pavement Marking Standards.

1. Grooving Concrete and Hot Mix Asphalt Pavement. If there are no markings on the pavement, it is the Contractor's responsibility to provide layout for exactly where the permanent markings will be placed. If there are temporary painted pavement markings, use these layout lines as a template for the grooving operation. If there are existing permanent pavement markings in place, remove them in accordance with 12SP-812P - Longitudinal Pavement Marking Removal prior to grooving operations.

Use equipment and methods approved by the manufacturer of the pavement marking material to be recessed for forming grooves in pavement surfaces. Dry-cut the grooves in a single pass using stacked diamond cutting heads on self-vacuuming equipment capable of producing a finished groove ready for pavement marking material installation.

Ensure that the bottom of the groove has a fine corduroy finish. If a coarse tooth pattern results, increase the number of blades and decrease the spaces on the cutting head until the required finish is achieved.

2. Groove Dimensions. Ensure grooves for recessed pavement markings are in accordance with the following:

Longitudinal Markings

Groove Width:	Material width +1 inch, ( $\pm 1/8$ inch)
Groove Depth:	As recommended by the manufacturer, ( $\pm 5$ mils)
Groove Position:	Center/Lane Lines: 2 inches from joint line, ( $\pm 1/8$ inch) Edge Lines: On lane, 2-4 inches in from the joint line, ( $\pm 1/8$ inch) Edge Lines for 14 foot paved lanes: as directed by the Engineer

Transverse Markings - Stop Bars, Crosswalks, and Cross Hatching

Groove Width:	Material width +1 inch, ( $\pm 1/8$ inch)
Groove Depth:	As recommended by the manufacturer, ( $\pm 5$ mils)

Groove Position: In the exact location where the transverse marking will be placed

Transverse Markings - Legends

Groove Width: For legends groove a rectangle encompassing the entire legend. The size of the rectangle must be the legend dimensions +1 inch ( $\pm 1/8$  inch) on each side.

Groove Depth: As recommended by the manufacturer, ( $\pm 5$  mils)

Groove Position: In the exact location where the transverse marking will be placed

Transverse Markings - Symbols

Groove Width: When grooving for arrow heads use a grinding head not larger than 7 inches in width and match the shape of the arrow head as closely as possible. For arrow stems and other symbols groove to the material shape +1 inch ( $\pm 1/8$  inch) on each side. If the symbol shape cannot be followed, such as the bicycle and arrow symbols, determine an acceptable grooving layout with the Engineer.

Groove Depth: As recommended by the manufacturer, ( $\pm 5$  mils)

Groove Position: In the exact location where the transverse marking will be placed

Turning Guide Line Markings

Groove Width: Material width +1 inch, ( $\pm 1/8$  inch)

Groove Depth: As recommended by the manufacturer, ( $\pm 5$  mils)

Groove Position: In the exact location where the turning guide line markings will be placed

3. Placing Recessed Pavement Markings. Place the pavement marking material in the grooves within 24 hours of the grooves being made. Ensure the grooves are clean and dry prior to placing pavement marking material. Locate the groove so the entire marking can be placed within the groove.

**d. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay items:

<b>Pay Item</b>	<b>Pay Unit</b>
Recessing Pavt Mrkg, Longit.....	Foot
Recessing Pavt Mrkg, Transv.....	Square Foot
Recessing Pavt Mrkg, Turning Guide Line.....	Square Foot

**Recessing Pavt Mrkg, Longit; Recessing Pavt Mrkg, Transv; and Recessing Pavt Mrkg, Turning Guide Line** includes layout of the pavement markings, when required, and all work as described in this special provision.

Permanent pavement marking materials, temporary retroreflective pavement markings required for traffic control, and removal of existing permanent pavement markings will be paid for separately using the appropriate pay items.

DETAILED SPECIFICATION  
FOR  
**NATIONAL TRANSPORTATION COMMUNICATIONS FOR INTELLIGENT  
TRANSPORTATION SYSTEM PROTOCOL COMPLIANT PORTABLE CHANGEABLE  
MESSAGE SIGN**

CFS:CRB/AA:MGN

1 of 6

APPR:CB:JVG:03-30-18  
12/17/18

**a. Description.** This work consists of furnishing, installing, maintaining, operating and removal of a *National Transportation Communications for Intelligent Transportation System Protocol (NTCIP)* compliant Portable Changeable Message Sign (PCMS) and control software for the PCMS. The PCMS must be capable of communication via a cellular network with software installed on a State-owned computer and must provide automated PCMS Global Positioning System (GPS) coordinate/location information as noted within this special provision. The PCMS must meet all requirements of sections 812 and 922 of the Standard Specifications for Construction and the *MMUTCD* and MDOT Portable Changeable Message Sign Guidelines - BOH IM 2011-02, except as modified herein.

1. General.

A. Provide a PCMS that meets all requirements as stated in this special provision; place the PCMS at the location(s) depicted within the plan set, or as directed by the Engineer; provide software capable of controlling the PCMS; commission the PCMS into the provided software; relocate and/or temporary remove the PCMS for construction phasing; and decommission and remove the PCMS upon completion of the project.

B. Comply with working clearances and dedicated spaces per *NEC Articles 110, 384 and 800-5*, as well as all current *NEC articles*, and Federal, State and Local regulations.

C. All equipment and equipment service and any appurtenances to the PCMS are the full responsibility of the Contractor.

D. Provide at minimum, one classroom style training session up to 2 hours, on PCMS operator interface software and field equipment, including but not limited to, posting and removal of messages, diagnosing field equipment malfunctions including messaging and communications errors. Supply all training schedules, syllabus and receive approval by the Engineer prior to delivery of training.

E. MDOT reserves the right to take full messaging control of any PCMS at any time throughout the duration of the project. This includes posting any message determined to be appropriate by MDOT, utilizing the Contractor supplied software and/or the Statewide Advanced Traffic Management System (ATMS) software.

2. Requirements of Regulatory Agencies. Comply with the following codes or standards:

A. *Institute of Electrical and Electronic Engineers (IEEE)*;

- B. *American Association of State Highway and Transportation Officials (AASHTO);*
  - C. *American Society of Testing and Materials (ASTM);*
  - D. *American Society of Civil Engineers (ASCE);*
  - E. *Institute of Electrical and Electronics Engineers (IEEE) 802.3;*
  - F. *National Electrical Manufacturers Association (NEMA);*
  - G. *National Fire Protection Association (NFPA) 780 - Lightning Protection Code;*
  - H. *Lightning Protection Institute (LPI) Standards 175;*
  - I. *Underwriters' Laboratories Standards (UL) 96 and 96A;*
  - J. *American National Standards Institute (ANSI) Standard C2;*
  - K. *National Transportation Communications for ITS Protocol (NTCIP).*
3. Portable Changeable Message Sign (PCMS) Submittals and Documentation. Submit the following:
- A. Product data for the PCMS and control software. Within 30 days of contract award or 14 days prior to deployment of PCMS, provide to the Engineer or their representative a list of PCMS that will be utilized on the project, including information necessary to integrate with the MDOT ATMS software. Information required includes, but is not limited to; PCMS and GPS equipment make, model number, communication settings, Internet Protocol (IP) addresses, etc. The Engineer will provide an electronic version of the format and information required for integration. Upon deployment of said devices at anytime prior to final acceptance of the project, inform the Engineer in writing of the specific PCMS device that has been placed in the field in active service or pending active service.
  - B. An electronic version and at least one printed version of the user manuals for the PCMS, GPS equipment and control software.
  - C. Training materials for the PCMS, GPS equipment and control software to be distributed during training.
4. *National Transportation Communications for Intelligent Transportation System Protocol (NTCIP).*
- A. The PCMS will communicate using the latest accepted *NTCIP* standards at the time of bidding, including all accepted amendments.
  - B. The PCMS will conform to *NTCIP Standard 2101* for direct communication and *NTCIP Standard 2104* for Ethernet communication.
  - C. All mandatory objects that are required by *NTCIP 1203*, whether or not they are specifically noted within this special provision, are required.

**b. Materials.**

## 1. Portable Changeable Message Sign (PCMS).

A. Provide a PCMS consisting of a Light Emitting Diode (LED) display, controller, solar/battery equipment and power supply, GPS equipment, and cellular service with a minimum data plan of 20 megabytes per month (MB/mo.), all mounted on a heavy duty towable trailer in accordance with subsections 922.07.C.5 and 922.07.C.6 of the Standard Specifications for Construction.

## B. Portable Changeable Message Sign (PCMS) Display.

(1) The display must be capable of displaying at least 3 lines of text, with at least 8 characters on each line. The display may be a full-matrix, line-matrix, or character-matrix design.

(2) When displaying 18 inch characters, the display will be legible between distances of 200 to 1,000 feet, with a 20 degree LED viewing angle for both day and night operations. All 20 degree LEDs will have a nominal viewing cone angle of 20 degrees with a half-power angle of 10 degrees measured from the longitudinal axis of the LED.

(3) The display will be rainproof and use materials that resist degradation due to exposure to ultraviolet (UV) light.

## (4) Fonts.

(a) The PCMS must be pre-loaded with at least the following fonts:

(i) 18 inch standard.

(b) The PCMS must display:

(i) All upper case letters;

(ii) Up to three lines of text per sign;

(iii) All numerals 0 to 9.

(c) The message must not scroll or move across the display.

(5) Display Brightness. The PCMS must automatically adjust the display brightness based on lighting conditions to maintain legibility to motorists at all times.

(6) In the event of a malfunction, the PCMS will default to a blank message.

## C. Power.

(1) The PCMS must utilize a power source in accordance with subsection 922.07.C.5 of the Standard Specifications for Construction and that is pre-approved by the Engineer.

(2) The power source must be able to continuously display a message of at least 24 characters, 24 hours per day, 7 days per week, for the duration that the PCMS is deployed in the field.

2. Software.

A. Provide the Engineer with computer software that will allow control of the PCMS from a remote location. The control software must, at a minimum, allow a trained user to display a message on the PCMS, clear a message, schedule messages for a specific date and time, observe the current message and PCMS status, and alert the user of any detected errors.

B. The software must be installed on a computer at a state-owned facility that is connected to the State of Michigan computer network. The software must be able to function properly using the version of Windows Operating System that is installed on the State of Michigan computer network at the time of PCMS deployment. If the software is web-based, it must be able to function properly in the version of Internet Explorer that is installed on the State of Michigan computer network at the time of PCMS deployment.

C. The software and devices must implement reasonable security measures that prevent unauthorized users from accessing the devices. This includes protection against "hacking" into the system via the Internet, and may require encrypted communication, Virtual Private Networks (VPNs), or other measures to ensure security of the PCMS and the software.

**c. Construction.**

1. Technical Assistance. Provide training and support for the PCMS and control software via telephone and e-mail, and provide on-site technical assistance as needed. Assistance may include, but may not be limited to, additional training, bug fixes, correction of installation problems, and correction of communication errors.

2. Installation.

A. Furnish materials that meet or exceed all applicable specifications, standards, and requirements before the PCMS is considered for acceptance. Ensure that all features, functions, and performance measures detailed herein, within the plan set, and/or in the Contract are provided.

B. The materials, equipment, and components must be commercial off-the-shelf (COTS) products.

3. Test Requirements.

A. Develop a detailed test plan for the PCMS, GPS equipment and control software, and make revisions as needed until it is approved by the Engineer. This may include, but is not necessarily limited to:

(1) Tests for defects in the PCMS, such as leaks, faulty wiring, faulty display modules, faulty batteries, firmware bugs, etc.

(2) Tests that demonstrate properly functioning communications between the PCMS, GPS equipment and the control software. The test procedure must demonstrate successful control of the PCMS from the location where the software has been installed.

(3) Assist with testing and verification of communications with the MDOT statewide ATMS software as designated by the Engineer. Integration assistance will include, but not limited to; verification of PCMS equipment settings with the MDOT ATMS Integration Contractor or MDOT Traffic Management Center (TMC) Operator, visual verification of PCMS messages posted from the ATMS software, and completion of PCMS and GPS equipment settings changes to allow for communications with the ATMS software. Note: The Contractor is not responsible for the actual integration of PCMS with the software, only assistance as defined above.

B. Conduct all testing in the presence of the Engineer or an approved representative. Any problems must be fixed and testing repeated until all elements of the PCMS, GPS equipment and control software are approved.

4. Warranty. Warrant that the PCMS will be serviced and fully operational during the life of the related project, as defined in 12SP-812C - Traffic Control Quality and Compliance.

d. **Security.** Ensure the PCMS board is secure, and complies with the following:

- 1. Create unique usernames and passwords (not defaults) for access to the PCMS local controls;
- 2. Remove all literature (manuals, instructions, etc.) from the PCMS controller enclosure;
- 3. Use a padlock, keyed lock, etc to prevent access to the controller enclosure;
- 4. Provide the Engineer up to 3 keys, or the lock combination, the username and password.

MDOT may, at any time, inspect PCMS boards that are on site to verify that the security measures in this special provision are being followed.

e. **Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay items:

<b>Pay Item</b>	<b>Pay Unit</b>
Sign, Portable, Changeable Message, NTCIP-Compliant, Furn .....	Each
Sign, Portable, Changeable Message, NTCIP-Compliant, Oper.....	Each

1. **Sign, Portable, Changeable Message, NTCIP-Compliant, Furn** includes all material, communication devices, equipment and labor required to furnish a PCMS and install at the location as depicted on the plans or as directed by the Engineer. The work for furnishing includes site delivery and setup, including initial testing and training, and the removal of the PCMS upon completion of the project.

2. **Sign, Portable, Changeable Message, NTCIP-Compliant, Oper** includes all material, communication devices, equipment, and labor required to operate, control, inspect, maintain, and relocate the PCMS throughout the life of the project.



CITY OF ANN ARBOR  
DETAILED SPECIFICATION  
FOR  
MINOR TRAFFIC DEVICES, MAX. \$ \_\_\_\_\_

WT:VCM/AA:MGN

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01/24/19

**a. Description.-** This work shall consist of protecting and maintaining vehicular and pedestrian traffic in accordance with the City of Ann Arbor Standard Specifications for Construction; Section 812 of the 2012 MDOT Standard Specifications for Construction; Part 6 of the Michigan Manual of Uniform Traffic Control Devices, Latest Revised Edition (MMUTCD); this Detailed Specification; and, as shown on the plans and as directed by the Engineer.

This item of work shall include, but not be limited to:

- The furnishing and operating of miscellaneous signs, warning devices, and cones as required for the entire duration of the project;
- The operation of additional signs furnished by the City;
- Maintaining pedestrian traffic;
- Temporarily covering conflicting traffic controls with Engineer-approved covers;
- Temporarily covering conflicting existing signs as directed by the Engineer with approved sign covers; and,
- Any and all other miscellaneous and/or incidental items that are necessary to properly and safely 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 plan set for this project.

**b. Materials.-** Traffic maintenance material and equipment shall meet the requirements as specified in Section 812.02 of the 2012 MDOT Standard Specifications for Construction.

**c. Construction Methods.-** 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 and at no additional cost to the City.

CITY OF ANN ARBOR  
DETAILED SPECIFICATION  
FOR  
MINOR TRAFFIC DEVICES, MAX. \$ \_\_\_\_\_

WT:VCM/AA:MGN

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01/24/19

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 that 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 sole expense.

The Contractor shall furnish and install the traffic control items as shown on the contract plan sheets and details included therein.

"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, if requested by the Contractor, and approved by the Engineer. All temporary pavement markings shall be removable.

**d. 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 shall be paid for at the contract unit price for the following contract item (Pay Item):

<u>Pay Item</u>	<u>Pay Unit</u>
Minor Traffic Devices, Max. ____	Lump Sum

The unit price for this item of work shall include all labor, material, and equipment costs required to perform the work specified herein.

CITY OF ANN ARBOR  
 DETAILED SPECIFICATION  
 FOR  
**TURF ESTABLISHMENT**

FTCH:KAP/AA:MGN

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12/21/18

**a. Description.-** This work shall consist of furnishing and placing Engineer-approved topsoil in thicknesses as specified, hydroseeding lawn areas, and furnishing and placing mulch blankets as indicated on the plans, as detailed in the specifications, or as directed by the Engineer.

The related work of preparing the earth bed, furnishing, and placing the topsoil, furnishing the seed mixtures, furnishing the fertilizer, sowing the seed, furnishing and installing the mulch blanket and watering shall conform to the requirements of this Special Provision and Section 816, Turf Establishment, of the Michigan Department of Transportation (MDOT) 2012 Standard Specifications for Construction.

**b. Materials.-** The materials shall meet the requirements specified in Section 917 of the 2012 MDOT Standard Specifications for Construction except as specified herein:

- Seed shall be fresh, clean, dry, new-crop seed complying with the AOSA’s “Rules for Testing Seed”, tested for purity and germination tolerances.

Variety	Proportion By Weight	Purity	Germination
Baron Kentucky Bluegrass	25%	90	80
Kentucky Bluegrass 98/80	15%	98	80
Park Kentucky Bluegrass	15%	90	80
Omega III Perennial Ryegrass	20%	98	90
Creeping Red Fescue	25%	95	90

Maximum weed content shall be 0.30%.

- Fertilizers shall be a Class A. The percentages by weight shall be at a minimum 10N-10P-10K or as required and approved by the Engineer.
- The seed, fertilizer, and adhesive (mulch binder) shall be mixed together and applied at one time.
- Water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances.

CITY OF ANN ARBOR  
DETAILED SPECIFICATION  
FOR  
**TURF ESTABLISHMENT**

FTCH:KAP/AA:MGN

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12/21/18

Mulch Blankets shall meet the requirements of Section 917.15.B.2.b of the 2012 MDOT Standard Specifications for Construction.

**c. Maintenance and Acceptance.-** It is the responsibility of the Contractor to establish a dense, vigorous, weed free 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 re-seeded. Such re-seeding shall be at the Contractor's expense and shall continue until a dense, vigorous and weed free lawn is established.

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 shall 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. The Contractor shall establish a uniform, dense, vigorous, and weed-free stand of the specified grasses. Maintenance includes, but is not limited to; deposition of additional topsoil; re-seeding; watering; fertilizing; mowing, and any other work as required to correct all settlement, erosion, germination, and establishment issues until the date of final acceptance by the Engineer.
- 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.

CITY OF ANN ARBOR  
DETAILED SPECIFICATION  
FOR  
TURF ESTABLISHMENT

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**d. Measurement and Payment.**- The completed work shall be paid for at the contract unit price for the following contract items (pay items):

<u>Contract Item (Pay Item)</u>	<u>Pay Unit</u>
Topsoil Surface, __ inch .....	Square Yard
Hydroseeding.....	Square Yard

"Topsoil Surface, \_\_ inch" and "Hydroseeding" will be measured by area in square yards and will be paid for at the contract unit prices which shall be payment in full for all labor, materials, and equipment needed to accomplish this work.

Topsoil placement shall occur at the locations called for on the plans or, as directed by the Engineer. The unit price "Topsoil Surface, \_\_ inch" shall include the grading of the area to receive the topsoil, preparing the earth bed, spreading and raking the topsoil to provide a uniform surface free of large clods, lumps, rocks, brush, roots, or other deleterious materials, as determined by the Engineer.

The hydroseeding shall be placed on all lawn areas as called for on the plans, and shall include furnishing and installing seed, fertilizer, mulch blankets, and all required watering necessary for the establishment of the turf. Watering will not be paid for separately.

Any damage or soiling to signs, fences, trees, pavements, or structures shall be repaired and/or cleaned by the Contractor at the Contractor's sole expense.

After initial placement of the topsoil and hydroseed mixture(s), fifty (50) percent of the total quantity placed for each item will be certified for payment. The remaining fifty (50) percent of the total quantities will be held by the Engineer until such time as all lawn areas have been established and accepted by the Engineer.

Final acceptance shall occur no sooner than June 15<sup>th</sup> of the year after the year in which the lawn areas were initially planted during the previous spring planting season; or, final acceptance will occur no sooner than November 1<sup>st</sup> of the year after the year in which the lawn areas were initially planted during the previous summer planting season.

In no case shall lawn areas be accepted in the same year in which they were planted.

CITY OF ANN ARBOR  
DETAILED SPECIFICATION  
FOR  
**WATER MAIN AND APPURTENANCES**

FTCH:KAP/AA:MGN

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12/21/18

**a. Description.-** The Contractor shall furnish all labor, equipment, pipe, valves, fittings, restrained-joint pipe, restrained-joint gaskets, special gaskets as detailed on the plans and in the specification, polywrap, blow-off assemblies, fire hydrants, fire hydrant extensions, supplemental lighting towers, and all other materials necessary to complete the work as shown on the Plans, as detailed in this Detailed Specification, and as directed by the Engineer.

All water main installation and testing procedures shall be performed in accordance with the plans, the requirements of this Detailed Specification, and as directed by the Engineer. The Contractor shall excavate all trenches and pits to the required dimensions; sheet, brace, and properly support the adjoining ground or structures where necessary to comply with MIOSHA, Section 104.07.B of the MDOT 2012 Standard Specifications for Construction, and other relevant safety standards.

The work for all items shall include, but not be limited to; pavement saw-cutting; excavation and disposal of excavated material; connections to new and existing water mains; the furnishing and installation of solid sleeves and push-on-joint plugs where needed; the furnishing, installation, and removal of sheeting and/or shoring where needed; all items necessary for the protection of the trench and all persons employed in the work during the work day and “after-hours” periods; polywrap; the furnishing, placement and compaction of approved bedding and backfill materials; thrust blocks; additional labor and equipment costs associated with any required nighttime water main work; cleaning, disinfecting, flushing, bacteriological and hydrostatic testing; and any other required items to complete the work as shown on the plans, as detailed in this Detailed Specification, and as directed by the Engineer.

**b. Materials.-**

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

CITY OF ANN ARBOR  
DETAILED SPECIFICATION  
FOR  
**WATER MAIN AND APPURTENANCES**

FTCH:KAP/AA:MGN

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- C. Information on equipment and methods to be used for flushing, chlorination, pressure and bacteriological testing.
- 2. General Specifications.
  - A. Cast Ductile Iron Pipe and Fittings:

Cast ductile iron pipe shall be Iron Grade 60-42-10 and meet the requirements of ANSI/AWWA C151/A21.51 in all respects; with standard thickness cement mortar lining and asphaltic seal coat in accordance with ANSI/AWWA C104/A21.4; and, coated outside with an asphaltic coating in accordance with ANSI/AWWA C151/A21.51. 100% of the ferrous metals used in the manufacture of cast ductile iron pipe shall be recycled from scrap and other sources.

All pipe shall be either Pressure Class 250 or 350 (Table 50.5 ANSI/AWWA C150/A21.50) as detailed on the plans, or Thickness Class 50 (Table 50.15, ANSI/AWWA C150/A21.50). Ductile iron pipe crossing under a railroad shall be thickness Class 56.

Restrained joint pipe, where called for on the Plans, shall be boltless, factory-manufactured, by the installation of retainer weldment and ductile iron locking segments or rings. Restrained joint pipe shall be Ductile Iron manufactured in accordance with the requirements of ANSI/ AWWA C151/A21.51. Joints for restrained joint pipe shall be in accordance with ANSI/AWWA C111/A21.11. Restrained joint fittings and the restraining components shall be Ductile Iron in accordance with applicable requirements of ANSI/AWWA C110/A21.10 and/or C153/A21.53 with the exception of the manufacturer's proprietary design dimensions. Push-on joints for such fittings shall be in accordance with ANSI/AWWA C111/A21.11.

Restrained joint pipe shall be TR-Flex restrained joint pipe manufactured by U.S. Pipe; Lok-Ring pipe for pipe diameters 54" through 64" or Flex-ring pipe for pipe diameters less than 54" manufactured by American Ductile Iron Pipe; or, equal as approved by the Engineer. Bolts and nuts for "field-cut" retainer assemblies shall be stainless steel.

CITY OF ANN ARBOR  
 DETAILED SPECIFICATION  
 FOR  
**WATER MAIN AND APPURTENANCES**

FTCH:KAP/AA:MGN

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Cast ductile iron fittings shall be push-on joint (with the exception of solid sleeves and fire hydrants which shall be mechanical joint), meeting the requirements of ANSI/AWWA C110/A21.10 for short body cast iron fittings. Fittings shall have a cement mortar lining and asphaltic seal coat in accordance with ANSI/AWWA C104/A21.4 and ANSI/AWWA C110/A21.10. The outside of all fittings shall have an asphaltic coating in accordance with ANSI/AWWA C110/A21.10.

Solid sleeves shall be long-pattern sleeves.

**B. Joints:**

Push-on joints shall be single gasket joint meeting the requirements of ANSI/AWWA C111/A21.11.

Mechanical joints for fire hydrants and solid sleeves shall be in accordance with ANSI/AWWA C111/A21.11 and shall be the Mega Lug Series 1100 joint restraint system manufactured by EBAA Iron Sales, Inc. or the Ford Meter Box Co. Uni-flange Retainer (UFR 1400-D-x style.)

Bolts for mechanical joints shall be high strength, low alloy steel bolts, only, meeting the requirements of ANSI/AWWA C111/A21.11. All bolts, nuts, and washers if required, shall be coated with a factory-applied flouropolymer coating meeting the following requirements:

Use Temperature: -100°F to 500°F

Salt Spray – ASTM B117 up to 4000 hours (nuts must not become frozen)

Pencil Hardness – 5H to 6H – ASTM D3363-92A

Kinetic Coefficient of Friction – 0.06 to 0.08

Thickness – nominal 0.001” (1 mil)

Impact – 160 in-lbs as measured by ASTM D2794-93

Adhesion – 5B – ASTM D3359-95

Di-electric Strength – 500V per mil

Elongation – 35% to 50%

Tensile Strength – 4,000 psi

Operating Pressure – up to 100,000 psi

Kesternich Test – Nuts not frozen up to 30+ cycles (DIN 50018)



CITY OF ANN ARBOR  
 DETAILED SPECIFICATION  
 FOR  
**WATER MAIN AND APPURTENANCES**

FTCH:KAP/AA:MGN

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Corrosion Resistance: as measured by;

ASTM D 1308	Muriatic Acid 31% HCL	24 hours	No Effect
	Sulfuric Acid 93% H <sub>2</sub> SO <sub>4</sub>	24 hours	No Effect
	Caustic Soda 100% NaOH	24 hours	No Effect
	Methy Ethyl Keytone MEK	24 hours	No Effect
ASTM B117	Salt Fog	1,000 hours	No Effect

The flouropolymer coating shall strongly adhere to surface being coated and shall not flake off or be easily removed by rubbing or brushing.

Restrained, push-on joint, pipe shall be American Pipe's "Fast-Grip" gasket system; U.S. Pipe's "Field-Lok 350" gasket system; or, Griffin Pipe "Field-Lok 350" gasket system.

The use of retainer glands and set screws shall not be acceptable.

Lubricants used in making up joints shall be supplied by the pipe manufacturer and the joints shall be coupled in accordance with the manufacturer's requirements.

C. Pipe Wrapping:

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

D. Water Main Pipe Marking:

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

- a) The pipe designation and class (e.g., D.I., Class 50).
- b) The name or trademark of the manufacturer.
- c) Country where cast.
- d) The year in which the pipe was produced.

CITY OF ANN ARBOR  
DETAILED SPECIFICATION  
FOR  
**WATER MAIN AND APPURTENANCES**

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The following shall be distinctly cast on each fitting:

- a) The pressure rating of the fitting.
- b) Nominal diameters of openings.
- c) The name or trademark of the manufacturer.
- d) Country where cast.
- e) The number of degrees or fraction of the circle on all bends.
- f) Ductile iron fittings shall have the letters "DI" or "Ductile" cast on them.

E. Manufacturer's Certification:

All pipe furnished shall be accompanied by the manufacturer's certificate of test showing conformity with the Specifications. Each certificate shall identify a specific lot number, quantity of pipe, and show actual test results for the lot furnished. These certificates shall be submitted to the Inspector at the time of unloading.

All materials that will potentially be in contact with the City of Ann Arbor water supply must be certified by Underwriters Laboratory (UL) or the National Sanitation Foundation (NSF) for use in a potable water system. These materials shall include pipe coatings, pipe metals, cement linings, and joint lubricants and gaskets.

F. Inspection:

All pipe furnished shall be subject to inspection on arrival at the job site by the Engineer. The purpose of the inspection shall be to cull and reject pipe or fittings that, independent of physical tests specified under the standard specifications designated herein, fail to conform to the requirements of these Specifications.

The Contractor shall notify the Engineer sufficiently in advance so that an Inspector may be on the job during the unloading of materials. A minimum notice of 24 hours is required for such unloading and inspection. The Contractor shall also notify the Engineer when the material has arrived at the site.

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All ductile iron water main pipe shall be stacked on pallets off of the existing grade, with each end plugged or bagged so as to keep the pipe interior clean until final installation.

Cast ductile iron pipe and fittings shall be subject to rejection on account of any of the following:

- a) Variation in any dimension exceeding the permissible variations given in the material specifications.
- b) Any crack or defect in the cement mortar lining which, in the opinion of the Engineer, is non-repairable, including, but not limited to, loose or "hollow" lining.
- c) Any signs of physical damage or poor manufacturing which might render the material unsuitable for its intended use.
- d) Variation of more than 1/16 inch per lineal foot in alignment of pipe intended to be straight.
- e) Damaged ends, where in the judgment of the Engineer such damage would prevent making a satisfactory joint.
- f) Improper handling during delivery, unloading, or installation.

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

G. Water Main Bedding and Backfill Materials:

Bedding and backfill material for Trench Detail I (under roadbed), Modified, shall be Granular Material, Class II, meeting the requirements of Section 902. Bedding and backfill for Trench Detail V (outside of the 1:1 influence line of roadbed or curb and gutter), Modified, shall be Granular Material, Class II and Engineer approved native material, placed in accordance with the trench details.

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

A. Dry Tap:

When a connection to an existing water main is to be made in the dry, the existing main to which a connection is to be made shall be isolated by the closing of the necessary existing valves, and the water from the existing main shall then be pumped out or removed by other means so that the connection may be made in the dry. All pipe materials and appurtenances which will come into contact with potable City water after the restoration of water service following the connections shall be disinfected with a strong chlorine solution prior to installation.

The Contractor may not operate City water main valves. For valve operation, contact City of Ann Arbor Public Services Area personnel; the City of Ann Arbor personnel will direct the operation of all valves by Contractor personnel. It is recommended that the Contractor request that the existing valves, which will need to be operated in order to perform the water main work, are checked in advance of the work to ensure that they operate properly. If the Contractor elects not to request the operation of the valves in advance of any required water main operation, then a request for extension of contract time will not be allowed.

It is possible that the valves which need to be operated to facilitate a shutdown will not close entirely, thereby allowing water to leak past the valve into the area of the shut down. The Contractor shall provide the necessary labor, material, and equipment to enable work to be completed with a poor shut down. Under no circumstances shall the Contractor be compensated for "downtime" associated with water main valve or appurtenance failure or its inability to properly operate or close fully. An extension of contract time may be allowed, if the Contractor has requested that the water main valves have been exercised in advance of the intended water main shutdown.

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Due to the size and length of pipe being shut down, and the quality of shut-down attained, large amounts of water may need to be removed from the excavation. Where possible, the water shall be run directly into nearby storm sewer inlets via pumps and hose.

The Contractor shall have all pipe, fittings and appurtenances required to complete the water main connection prior to the excavation for the connection, or the work will not be allowed to commence.

The Contractor shall complete the water main work in a manner which minimizes the disruption of water service to the greatest extent possible.

The City must notify all businesses 48 hours in advance of a water main shut-down; residences must be notified 24 hours in advance. To give the City an opportunity to provide such notification, the Contractor shall schedule the water main shut-downs at least 72 hours in advance, and preferably a full four or five days in advance, of the water main shut-down.

No water main shutdown shall take place after 12:00 p.m. (noon), unless written permission has been granted by the Engineer and that the Contractor has sufficient lighting equipment to provide a safe and efficient work area for working after dark. No water main will be shut down until the main has been exposed and cleaned, and is ready to be cut.

There shall be no gap larger than 1/4 inch left in the existing water main as a result of the tie-in. If needed, a closure piece ("thrust ring") of such size so as to meet this requirement shall be installed.

**B. Wet Tap:**

Prior to the installation of a tapping sleeve, the section of pipe to be tapped shall be cleaned of all foreign material and wire brushed to a smooth surface. The two halves of the sleeve shall be placed around the pipe with the gaskets installed per the manufacturer's instructions. The bolts shall be tightened evenly from the center toward the ends. The bolts shall be tightened to the manufacturer's specified torque.

When performing a wet tap in a prestressed concrete steel cylinder water main, grout is to be placed under the tapping saddle whether or not the saddle is epoxy coated.

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All pipe materials and appurtenances which may come into contact with potable City water shall be disinfected with a strong chlorine solution prior to installation. This includes the pipe section to be tapped, the two halves of the sleeve, gaskets and the gate valve.

Prior to installation of the end gaskets, the sleeve shall be blocked with cement bricks such that the outlet is in proper position. The end gaskets shall be installed with an overlap as specified by the manufacturer.

The glands shall be assembled on the pipe. The bolts around the gland shall be tightened evenly, causing the gaskets to uniformly compress.

The valve shall be installed on the sleeve following the manufacturer's instructions.

Prior to tapping, the assembly shall be tested using the test plug tap in the sleeve with the valve closed, or by placing a tapped plug on the outlet of the valve with the valve open. The assembly shall be pressurized to 150 psi and hold the pressure fifteen minutes. After the pressure test is complete, the pipe shall be tapped.

C. Oversized Water Mains:

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

D. Permissible Deflection at Joints:

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

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the Engineer. The deflection shall not exceed the following amounts:

Size of Pipe (Inches)	Joint Angle (Degrees)	Deflection in 18 ft. (Inches)	Approx. Radius of Curve Produced by Succession of 18 ft. Lengths (Feet)
4	5	19	205
6	5	19	205
8	5	19	205
10	5	19	205
12	5	19	205
16	3	11	340
20	3	11	340
24	3	11	340
30	3	11	340

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

E. Trench Opening:

The Contractor shall fully comply with all laws and regulations governing construction methods and the furnishing and use of all safeguards, safety devices, protective equipment, and pollution controls. Where required to support the surfaces of adjacent roadways, structures, or excavations, or to protect the construction work, adjacent work, or workmen, the Contractor shall design and install sheeting, bracing, and shoring. The Engineer will not review the Contractor's design(s) or be responsible for the adequacy of the elements supporting the trench. The placing of such supports shall not release the Contractor of the responsibility for the sufficiency and integrity of the trench, trench opening, and the safety of all persons involved in the work.

Sheeting, bracing, and shoring shall not be left in place after completion of the work except as required by the Engineer. In the removing of sheeting and bracing after the construction has been completed, special care shall be taken to prevent any caving of the sides of the excavation and injury to the completed work or to adjacent property. Where the Engineer requires the sheeting, bracing, or shoring to be left in place it shall be cut off below the established surface grade as required by the Engineer.

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All excavation shall be performed in such a manner as to provide adequate room for the construction and installation of the work to the lines, grades and dimensions shown on the Plans. The width of the trench shall be ample to permit the pipe to be laid and jointed properly, and the backfill to be placed and compacted as specified. For each size of pipe, the minimum trench width shall provide clearance of four inches on each side of the bell of the pipe or fitting or six inches on each side of the pipe barrel, whichever is greater. Trenches shall be of such extra width, when required, to permit the convenient placing of timber supports, sheeting and bracing, and handling of special fittings. The Work shall be performed such that the existing utilities, asphalt curb and gutter, and existing pavement shall be protected at all times.

In excavating for water mains, the excavation shall at all times be finished to the required grade in advance of the pipe line, but unless otherwise permitted in writing by the Engineer, not more than 50 feet of trench shall be open at one time in advance of the pipe. At no time shall more than 200 feet of trench be opened and incompletely backfilled. At the end of each day, no more than 10 feet of trench may be left open, and access to all drives shall be restored. This opening shall be surrounded by fencing and barricades, or plated. The remainder of the trenching operation shall be available for safe vehicular and pedestrian traffic at all times.

It is essential that the discharge of the trench de-watering pumps be conducted to natural drainage channels, drains, or storm sewers. Engineer-approved soil erosion and sedimentation controls shall be installed and maintained at the point of discharge.

The length of street which may be occupied by the construction work at any one time shall be subject to the approval of the Engineer and will be based on the requirements of use of the street by the public.

**F. Laying Pipe:**

Each pipe shall be inspected for defects prior to being lowered into the trench. Inside of pipe and outside of spigot shall be cleaned of any earth or foreign matter.

Proper implements, tools, and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and convenient prosecution of the work. All pipe, fittings, valves, and hydrants shall be carefully lowered into the trench piece by piece by means of an excavator using chains, slings, or other



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suitable tools or equipment as recommended by the manufacturer, in such a manner as to prevent damage to them and their protective coatings and linings. Under no circumstances shall materials be dropped or dumped into the trench.

New water main construction shall not be connected into the existing system until it has been tested and accepted by the Engineer. The Contractor shall excavate for all bell holes and shall place the bell of the pipe in the excavated bell hole. Pipe shall be laid on the prepared trench bottom with the bell ends facing the direction of laying, unless otherwise directed by the Engineer.

The Contractor shall take every precaution to prevent foreign material from entering the pipe while it is being placed in the line. During laying operations, no debris, tools, clothing or other materials shall be placed in the pipe. At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug. This provision shall apply during the noon hours as well as overnight. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry.

Pipe shall be jointed as specified elsewhere herein. The pipe shall be secured in place with approved backfill material tamped under it except at the bells. Pipe and fittings which do not allow a sufficient and uniform space for joints shall be removed and replaced with pipe and fittings of proper dimensions to insure such uniform space. Precautions shall be taken to prevent dirt from entering the joint space.

All pipe shall be laid at the correct line and grade as indicated by the grade stakes and offset line. Each pipe, as laid, shall be checked by the Contractor to ensure that this result is obtained. The staking shall be provided by the Engineer. No pipe shall be laid until a cut sheet for that pipe has been approved by the Engineer. The grade as shown on the Plans is that of the top-of-pipe for water main; and, the work must conform to this profile. For water main construction, a variation from the profile grade of two inches with ductile iron pipe, and three inches with reinforced concrete pipe, will be deemed sufficient reason to cause the work to be rejected and re-laid. Water main pipe alignment shall be maintained so as not to vary more than three inches from the correct line. Any pipe found out of line shall be re-laid properly by the Contractor.

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

G. Crossing Existing Structures and Facilities:

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

H. Cutting Pipe:

Cutting cast iron or ductile iron pipe for inserting valves, fittings, or closure pieces shall be performed in a neat and workmanlike manner without damage to the pipe or cement lining and so as to leave a smooth end at right angles to the longitudinal axis. Where the type of pipe joint in use is such that it employs push-on assembly to affect the joint seal, the outside of the cut end shall be tapered back 1/8 inch with a coarse file or a portable grinder at an angle of about 30 degrees. The tapering must remove all sharp and/or rough edges which might injure the gasket.

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The flame cutting of pipe will not be allowed. Reinforced concrete water main pipe shall not be cut.

I. Setting Water Main Fittings and Accessories:

Valves, fittings, plugs, hydrants, etc. shall be set and joined to pipe in the manner specified in the Section entitled "Making Joints."

Hydrants shall be located as shown on the Plans or as directed by the Engineer in such a manner as to provide complete accessibility and minimize the possibility of damage from vehicles or injury to pedestrians.

J. Making Joints:

Mechanical means shall be used for pulling home all rubber-gasket pipes regardless of trench condition where manual means will not result in pushing and holding the pipe home. When a trench box or liner is used, a cable shall be used to pull the joints home and hold them in position.

Where work is performed in wet trenches or trenches with running sand, the Contractor shall provide and use mechanical means for pulling the pipe home in making up the joint and for holding the pipe joints tight until completion of the line. Mechanical means shall consist of a cable placed inside or outside of the pipe with a suitable winch, jack, or come-along for pulling the pipe home and holding the pipe in position.

Where not required by these Specifications, manual means will be acceptable only if the joints can be pushed home and held.

K. Anchorage for Water Main Fittings and Accessories:

All plugs, caps, tees, hydrants, and bends shall be provided with MDOT Grade S2 concrete meeting the requirements of Section 701 of the 2012 MDOT Standard Specifications for Construction reaction backing (thrust block) as shown on the Plans or specified herein. Valves shall be restrained from movement at adjacent sleeves by the use of a closure piece, or thrust ring (full size pipe section cut to fill the gap inside the sleeve to within 1/4") as specified herein.

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Reaction backing shall be placed between unexcavated solid ground and the fitting to be anchored. The area of bearing on the pipe and on the ground in each instance shall be that shown on the details or directed by the Engineer. The reaction backing shall, unless otherwise shown or directed, be so placed that the pipe and fitting joints will be accessible for repairs. This shall include adequate protection of any bolts from direct contact with the concrete.

Metal harnesses of tie rods or clamps may not be used instead of concrete reaction backing. Mega-Lug joint restraint systems and restrained, push-on joint, pipe shall be used where connections to existing lines require immediate pressurization, as specified herein.

In the event that the Engineer determines a change in the anchorage or design is required due to unsuitable earth conditions, changes may be ordered by the Engineer.

The use of friction clamps or set-screw type retainer glands for thrust restraint will not be allowed.

M. Water Main Testing:

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

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**Bacteriological Testing Sequences:**

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

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

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

\*\*Discharge flush water into approved sanitary sewer.

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

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N. Hydrostatic (Pressure Test):

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

Maximum Allowable Leakage per 100 Joints at 150 psi Avg. Test Pressure

Pipe Diameter (Inches)	4	6	8	10	12	16	20	24	30	36
Leakage (gallons/hr)	0.66	0.99	1.32	1.66	1.99	2.65	3.30	3.97	4.97	5.96

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

O. Flushing and Swabbing:

The Contractor shall flush the water main after making a connection to the existing City water main where a valve separates the new water main from the existing main. As a result, flushing will be accomplished using flow through the full size of the new water main. If a storm water retention/detention facility is to be constructed as part of the project, this facility is to be completed, stabilized, operable, and utilized for the collection of the flushing water. All pipe, materials, and appurtenances which will come into contact with potable City water after the

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restoration of water service following the connection shall be disinfected with a strong chlorine solution prior to installation.

Water main shall be cleaned using a high density poly-pig, Girard Aqua Swab (2 lbs/ft<sup>3</sup> density) swab, or Engineer approved equal and flushed. The diameter of the blow-off pipes shall be at least 50% of the diameter of the pipe being flushed. Hydrants, with internal components removed, may serve as blow-offs for mains 12 inches and less. The Contractor shall provide details, for the review and approval of the Engineer, for the various required blow-offs. Blow-off pipes, discharge hoses, where needed, and associated costs shall be included in the cost of the permanent water main being installed and will not be paid for separately. If there are no branch connections to be swabbed, the poly-pig shall be inserted in the new water main at the time of connection described above. The poly-pig shall be located on the "downstream" or new side of the separation valve. The poly-pig shall then be forced through the new water main during the first flush and discharged through a construction blow-off of sufficient size to allow passage of the poly-pig. For water mains with branch connections, a launching tee or wye shall be installed as shown in the details, for launching multiple poly-pigs. The main line and each branch main shall be flushed and swabbed individually. Following the successful final bacteriological testing of the water main, the launching tee/wye shall be permanently capped at its branch.

During the flushing and swabbing of a water main, the discharge point for the main shall be left open, with all other discharge points closed, to direct the poly-pig completely through the main being swabbed to its point of termination. Following the initial swabbing of water main, the separation valve shall be closed, and then the discharge point closed. If a branch water main is to be swabbed, the poly-pig is then to be placed in the launcher; the discharge point for the branch water main is to be opened; the poly-pig is to be inserted into the water main; the separation valve partially opened and the branch water main flushed and swabbed.

Following the swabbing of the water main(s), the water main(s) are to be flushed as required. If approved or directed by the Engineer, the water main(s) may be flushed overnight, provided that proper controls (i.e. hoses directed into storm structures, etc.) are installed to direct and control the flushing water.

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P. Chlorination:

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

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

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

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



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**Q. Bacteriological Testing:**

The City will obtain bacteriological samples of the water in the mains for analysis from testing blow-offs, corporations, or other sampling points as determined acceptable by the City. Samples will be taken after the mains have been satisfactorily chlorinated in accordance with these Specifications, the chlorinated water flushed out and removed, and the mains filled with potable water. The water samples will only be bacteriologically tested at the City's Water Treatment Plant Laboratory; the use of other laboratories or testing locations shall not be allowed or deemed to provide satisfactory test results by the City of Ann Arbor under any circumstance. No samples will be deemed acceptable until they meet all city requirements. If the newly constructed water main is connected at one end to an in-service section of the City water main, and the chlorination precedes pressure testing, the City will also take samples after satisfactory pressure testing. In each case, two sets of samples shall be taken; a period of 24 hours must elapse between flushing of the main and drawing of the first samples, with the second samples being drawn 24 hours after the first samples were drawn. For each sample, a minimum of 48 hours is required to obtain test results. All samples must pass the bacteriological test.

The Contractor shall plan for these testing sequences and durations in his construction schedule. Contract time will continue during all water main testing phases, regardless of duration.

**d. Construction, General Requirements.-** coordination with the City of Ann Arbor Field Operations Unit for the installation of 1-inch corporations in the gate wells to be used for water main testing and/or filling of new main.

The Contractor must have all materials, fittings, pumps and other miscellaneous equipment, and personnel on-site before the City of Ann Arbor Public Services personnel will prepare and shutdown and existing main.

The bedding and backfill for Trench Detail I (under roadbed), Modified, shall be MDOT Granular Material, Class II compacted to 95% of its maximum dry density in maximum lifts of 12 inches. The bedding and backfill for Trench Detail V (within 1:1 influence of the roadbed or curb and gutter), Modified, to a point 12 inches above the top of pipe, shall be MDOT Class II sand compacted to 95% of its maximum dry density. The material above this point shall be Engineer-approved native material compacted to 90% of its maximum dry density.

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The Contractor shall dig-up and expose all utility crossings prior to laying any water main pipe. This will allow the Engineer to adjust the grade of the water main, if possible, to avoid the existing utilities. The costs of the ‘dig-ups’, and all related costs, shall be included in the respective items of work in this Detailed Specification. Some “dig-ups” may need to occur out of Phase.

Should the water main, or other pay items in this Detailed Specification, conflict with abandoned sewers or water mains, the conflicting section of the abandoned sewer or water main shall be removed and the remaining sections shall be (re)abandoned in accordance the Detailed Specification for “Water Main and Appurtenances, Abandon” and the Detailed Specification for “Sewer, Any Size or Depth, Abandon,” except that flow filling the sewer will not be required. All the work shall be included in the cost of the water main, or other pay items in this Detailed Specification.

**e. Lighting Requirements for Nighttime Water Main Work.-** Night work shall be lighted to an average intensity of 10 foot-candles minimum. Sufficient light sources shall be provided to achieve this illumination requirement. The lighting scheme shall be submitted to the Engineer for review and approval a minimum of 72 hours prior to the anticipated commencement of the nighttime work. Nighttime work will not be allowed to begin until such time as the lighting scheme has been approved by the Engineer.

The lighting shall allow the inspector to clearly see and inspect all work operations. Light sources shall be adjusted as directed by the Engineer, as many times as needed, in order to meet the requirement.

Lighting systems may be fixed, portable, or equipment mounted. A power source shall be supplied with sufficient capacity to operate the lighting system. The power source shall not violate any local noise ordinance requirements. The lighting system(s) shall be arranged such that they do not interfere with the vision of motorists, glare or shine in the eyes of oncoming drivers, or unnecessarily illuminate surrounding properties or residences. After initial set-up, drive through and observe the lighted area from each direction on the roadway. Adjust lighting units as many times as needed in order to comply with these requirements.

**f. Sequence of Construction.-** All water main construction shall be completed in accordance with the Detailed Specification entitled “Maintaining Traffic and Construction Sequencing” and as detailed herein. The Contractor shall schedule and coordinate all water main shutdowns with the Engineer. The Contractor shall submit for the Engineer’s

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review and approval the sequence of all water main “shut downs” and tie-ins such that disruption in service to existing properties is minimized to the greatest extent possible. Should the Engineer not accept the Contractor’s proposed construction sequence, it shall not be a basis of claim for extension of contract time or additional compensation.

All water main and appurtenances shall be pressure tested, cleaned, disinfected and bacteriological tested in accordance with the specifications outlined within this Detailed Specification.

After acceptance of each section of new main the Contractor shall begin coordination with the City of Ann Arbor Public Services Area for the installation of water services, curb stops and boxes in accordance with the Detailed Specification entitled “Excavate and Backfill for Water Service Tap and Lead.”

**g. Measurement and Payment.-** The completed work will be paid for at the contract unit prices for the following contract items (pay items):

<u><b>Contract Item (Pay Item)</b></u>	<u><b>Pay Unit</b></u>
PC 350, D.I. Water Main, w/ Polyethylene Wrap, ___ inch, Tr Det I, Mod.....	Foot
PC 350, D.I. Water Main, w/ Polyethylene Wrap, ___ inch, Tr Det V, Mod .....	Foot
___ deg Bend, ___ inch .....	Each
Sleeve, ___ inch .....	Each

All work shall be paid in full at the contract unit prices which shall include all labor, materials and equipment required including all required costs associated with night time work, supplemental lighting, and all other required elements of the work.

Fittings other than those specifically listed as separate contract items, blow-off assemblies, hoses, and restrained joint pipe and gaskets, special gaskets, and the like, shall not be paid for separately, but shall be considered included in the payment for “D.I. Water Main, w/Polyethylene Wrap, \_\_\_ inch, Tr Det \_\_\_.”

Tees, Bends, and Reducers and other fittings specifically listed as separate contract items (pay items), shall be paid for at the contract unit price for each unit installed.

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**a. Description.** This work includes installing sanitary sewer, manholes and related items. The Contractor shall furnish all materials, equipment, tools, and labor necessary to perform the work required by this special provision and shall unload, haul, distribute, store, and install all pipe, fittings, castings, manholes, and accessories.

The Contractor shall excavate all trenches and pits to the required dimensions; excavate the bell holes; sheet, brace, and properly support the adjoining ground or structures as necessary to comply with MIOSHA and other relevant safety standards; properly handle and remove all drainage or ground water so that the work can be completed in accordance with the specifications; install and test the pipe, fittings, castings, manholes, and accessories; backfill and compact all fill materials within trenches and pits; and remove and properly dispose of surplus or unsuitable excavated material off-site.

The MDEQ permit required to perform the sanitary sewer work shown on the plans is included in the proposal.

**b. Materials.** Materials shall conform to the Michigan Department of Transportation 2012 Standard Specifications for Construction, Sections:

Concrete, Grade S2.....	701
Mortar, Type R-1 .....	702
Granular Material, Class II .....	902
Coarse Aggregate, 6A .....	902
Steel Reinforcement .....	905
Castings .....	908
Miscellaneous Metal Products.....	908
Geosynthetics.....	910
Masonry Units .....	913

**Bedding and Backfill**

Coarse Aggregate, 6A shall be crushed limestone. Concrete, Grade X shall consist of Portland cement, coarse and fine aggregates, and water, proportioned with 282 lbs. cement (3 sacks) per cubic yard to produce a minimum 28 day compressive strength of 1000 psi.

Bedding and backfill for Trench Detail I, Modified shall be Granular Material, Class II, meeting the requirements of Section 902. Bedding and backfill for Trench Detail V,

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Modified shall be Granular Material, Class II and Engineer-approved material for the backfill that is placed at an elevation greater than 1-foot above the top-of-pipe and/or Outside 1:1 influence line of paved areas. All pipe shall be concrete, contain steel reinforcement, and shall be of the type, class, and size as shown on the plans.

#### Reinforced Concrete Sewer Pipe

Reinforced concrete pipe shall conform to the requirements for reinforced concrete pipe of ASTM Designation C 76, Class IV, unless otherwise designated on the Plans. For diameters larger than listed in ASTM Specifications, wall thickness and reinforcing steel shall be as shown in Section 909 Table 909-3 or 909-4 as applicable.

Reinforced elliptical concrete pipe shall conform to the requirements for reinforced concrete elliptical pipe of ASTM Designation C 507, Class as designated on the Plans. For diameters larger than listed in ASTM Specifications, wall thickness and reinforced steel shall be as shown in Section 909 Table 909-5.

Joints for reinforced concrete pipe shall meet ASTM C 443 and shall be rubber gasket for tongue and groove, full bell and spigot rubber O-ring gasket, or modified grooved tongue with rubber gasket. Joints for sewers over 36 inches in diameter shall have inside joints cement mortar pointed to their full depth and shall have the outside joints provided with a cement mortar collar.

Joints for reinforced concrete elliptical pipe shall be mastic compound with inside cement mortar pointing to full depth and outside cement mortar collar.

Lubricants used in making up joints shall be supplied by the pipe manufacturer and the joints shall be coupled in accordance with the manufacturer's requirements.

Class X concrete as described in this special provision shall consist of Portland Cement, coarse and fine aggregates, and water, proportioned with 282 lbs. cement (3 sacks) per cubic yard to produce a minimum 28 day compressive strength of 1000 psi.

#### Ductile Iron Sewer Pipe

Cast ductile iron pipe shall be Iron Grade 60-42-10 and meet the requirements of ASTM A746. Ductile iron sewer pipe shall have a factory-applied ceramic epoxy lining and coated outside with an asphaltic coating in accordance with ANSI/AWWA

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C151/A21.51. 100% of the ferrous metals used in the manufacture of cast ductile iron pipe shall be recycled from scrap and other sources.

Ductile iron sanitary sewer pipe joints shall be push-on joint and meet the requirements of ANSI/AWWA C151/A21.51 in all respects and coated outside with an asphaltic coating in accordance with ANSI/AWWA C151/A21.51.

Fittings shall be mechanical joint and meet the requirements of ANSI/AWWA C110/A21.10 for short body cast iron fittings. The outside of all fittings shall have an asphaltic coating in accordance with ANSI/AWWA C110/A21.10. Mechanical joint fittings shall utilize the Mega Lug Series 1100 joint restraint system manufactured by EBAA Iron Sales, Inc. or the Ford Meter Box Co. Uni-flange Retainer (UFR 1400-D-x style.)

All ductile iron sanitary sewer pipe shall have pipe wall thicknesses (ductile iron only) meeting the requirements of Pressure Class 350 (Table 50.5 ANSI/AWWA C150/A21.50.) All fittings shall be ceramic epoxy lined.

The ceramic epoxy coating placed inside of ductile iron sanitary sewer pipe and fittings shall meet the requirements of the Detailed Specification entitled "Material and Application Requirements for Ceramic Epoxy Coated Ductile Iron Pipe for Sewer Service" contained elsewhere in the contract documents.

Bolts for mechanical joints shall be high strength, low alloy steel bolts, only, meeting the requirements of ANSI/AWWA C111/A21.11. All bolts, nuts, and washers if required, shall be coated with a factory-applied flouropolymer coating meeting the following requirements:

- Use Temperature: -100°F to 500°F
- Salt Spray – ASTM B117 up to 4000 hours (nuts must not become frozen)
- Pencil Hardness – 5H to 6H – ASTM D3363-92A
- Kinetic Coefficient of Friction – 0.06 to 0.08
- Thickness – nominal 0.001" (1 mil)
- Impact – 160 in-lbs as measured by ASTM D2794-93
- Adhesion – 5B – ASTM D3359-95
- Di-electric Strength – 500V per mil
- Elongation – 35% to 50%
- Tensile Strength – 4,000 psi
- Operating Pressure – up to 100,000 psi
- Kesternich Test – Nuts not frozen up to 30+ cycles (DIN 50018)

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Corrosion Resistance: as measured by;

ASTM D 1308	Muriatic Acid 31% HCL	24 hours	No Effect
	Sulfuric Acid 93% H <sub>2</sub> SO <sub>4</sub>	24 hours	No Effect
	Caustic Soda 100% NaOH	24 hours	No Effect
	Methy Ethyl Keytone MEK	24 hours	No Effect
ASTM B117	Salt Fog	1,000 hours	No Effect

The flouropolymer coating shall strongly adhere to surface being coated and shall not flake off or be easily removed by rubbing or brushing.

The use of restrained, push-on joint, pipe or fittings shall not be allowed as it can damage the ceramic epoxy coating system. The use of retainer glands and set screws shall not be acceptable.

Lubricants used in making up joints shall be supplied by the pipe manufacturer and the joints shall be coupled in accordance with the manufacturer's requirements.

**Manholes**

All sanitary sewer manholes shall be constructed of precast reinforced concrete sections. Precast drainage structures shall be designed to accommodate HL-93 Modified Live Load requirements as determined by a Professional Engineer licensed by the State of Michigan, regardless of where they are to be installed. For the purposes of design, a HL-93 Modified Live Load shall consist of 1.2 times the design truck or 1.2 times a single 60 kip load, whichever produces the greater stresses.

Precast reinforced concrete bases, bottom sections, manhole risers, grade adjustment rings, concentric cones, eccentric cones, and flat top slabs shall conform to the requirements of ASTM C 478. Joints on precast manholes used on all sanitary sewers shall meet ASTM C 443, rubber O-ring gasket.

Concrete brick shall conform to the requirements for concrete building brick, ASTM C 55, Grade N-1.

Cast iron frames and covers for manholes shall conform to the requirements for grey iron castings, ASTM A 48, Class No. 30. Specific, approved castings are listed in the Special Provision for "Dr Structure Covers."

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Plastic coated manhole steps shall be injection molded of copolymer, polypropylene, encapsulating a 1/2 inch grade 60 steel reinforcing bar. Plastic-coated manhole steps shall meet the performance test described in ASTM C-478, Paragraph II, and shall have an impact resistance of 300 ft.-lbs., with only minor deflection and no cracking or breaking.

The steps shall resist pull out forces of 1500 lbs.

Sewer pipe to precast manhole connections shall be through:

1) A flexible neoprene rubber boot which shall be securely clamped into a core-drilled pipe port. Pipe ports shall be core-drilled at the point of manhole manufacture and shall be accurately located within 1/2-inch of proposed sewer centerline;

2) a self-adjusting mechanical pipe to manhole seal which provides a resilient, flexible, and infiltration-proof joint;

3) a flexible rubber wedge firmly rammed into a rubber gasket which is cast into the manhole as approved in writing by the Engineer.

Neoprene rubber for manhole boots shall meet the requirements of ASTM C 443 and shall have a minimum thickness of 3/8-inch. Pipe clamp bands shall be of corrosion-resistant steel.

**c. Inspection and Delivery.-** The following information shall be clearly marked on each length of pipe:

- a) The pipe designation and class (e.g., C 76, Class IV).
- b) The name or trademark of the manufacturer.
- c) Identification of the manufacturing plant.
- d) The date of manufacture.
- e) Testing lot number or testing lab stamp.
- f) Reinforced concrete pipe with elliptical reinforcement shall be clearly marked on the inside and the outside opposite walls along the minor axes of the elliptical reinforcing.
- g) Beveled pipe shall be marked with the amount of bevel and the point of maximum length shall be marked on the beveled end.

All pipe furnished shall be subject to inspection on arrival at the job site by the Engineer. The purpose of the inspection shall be to cull and reject pipe or fittings that,



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independent of physical tests specified under the standard specifications designated herein, fail to conform to the requirements of these Specifications.

The Contractor shall notify the Engineer sufficiently in advance so that an Inspector may be on the job during the unloading of materials. A minimum notice of 24 hours is required for such unloading and inspection.

Concrete pipe of any type shall be subject to rejection on account of any of the following:

- a) Variation in any dimension exceeding the permissible variations given in the material specifications.
- b) Fractures or cracks passing through the wall.
- c) Defects that indicate imperfect proportioning, mixing, or molding.
- d) Surface defects indicating honeycombed or open texture.
- e) Variation of more than 1/16 inch per lineal foot in alignment of pipe intended to be straight.
- f) Insecure attachment of branches or spurs.
- g) Damaged ends, where in the judgment of the Engineer such damage would prevent making a satisfactory joint.

Cast ductile iron pipe and fittings shall be subject to rejection on account of any of the following:

- a) Variation in any dimension exceeding the permissible variations given in the material specifications.
- b) Any crack or defect in the epoxy lining which, in the opinion of the Engineer, is non-repairable, including, but not limited to, loose or "hollow" lining.
- c) Any signs of physical damage or poor manufacturing which might render the material unsuitable for its intended use.
- d) Variation of more than 1/16 inch per lineal foot in alignment of pipe intended to be straight.
- e) Damaged ends, where in the judgment of the Engineer such damage would prevent making a satisfactory joint.
- f) Improper handling during delivery, unloading, or installation

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

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All pipe furnished shall be accompanied by the manufacturer's certificate of test showing conformity with the Specifications. Each certificate shall identify a specific lot number, quantity of pipe, and show actual test results for the lot furnished. These certificates shall be submitted to the Inspector at the time of unloading.

**d. Construction.**

General

The Contractor shall fully comply with all laws and regulations governing construction methods and the furnishing and use of all safeguards, safety devices, protective equipment, and pollution controls. Where required to support the surfaces of adjacent roadways, structures, or excavations, or to protect the construction work, adjacent work, or workmen, the Contractor shall design and install sheeting, bracing, and shoring. The Engineer will not review the Contractor's design(s) or be responsible for the adequacy of the elements supporting the trench. The placing of such supports shall not release the Contractor of the responsibility for the sufficiency and integrity of the trench, trench opening, and the safety of all persons involved in the work. In the removing of sheeting and bracing after the construction has been completed, special care shall be taken to prevent any caving of the sides of the excavation and injury to the completed work or to adjacent property.

Material Handling:

Pipe, fittings and accessories shall be loaded and unloaded by lifting with hoists or skidding so as to avoid shock or damage. Under no circumstances shall such material be dropped. Pipe handled on skidways shall not be skidded or rolled against pipe already on the ground.

In distributing the material at the site of the work, each piece shall be stored off of the ground surface by means of skids or bunks, and stacked neatly. Pipe may be "strung-out" for only the length which, in the opinion of the Engineer, will be installed within 24 hours, if maintained such that the pipe interior will remain free of dirt, mud, and debris.

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**Excavation:**

The Contractor shall dig-up and expose all utility crossings prior to laying any sanitary sewer pipe or lead. This will allow the Engineer to adjust the grade of the sanitary sewer or lead, if possible, to avoid the existing utilities. The costs of the dig-ups, and related costs, shall be included in the unit price of the sanitary sewer or lead. The Engineer may require that some dig-ups be performed out-of the staging area where the sewer work is taking place in order to aid in alignment decisions. Any required traffic control measures shall be included in the costs of "Minor Traffic Devices, L.S. Max.\_\_\_\_" and "Traf Regulator Control."

Excavation shall include the removal and disposal of all materials of every kind, including rock, boulders, or buried obstructions necessary to be removed in the construction work.

The Contractor shall proceed with caution in the excavation and preparation of the trench so that the exact location of underground structures, both known and unknown, may be determined, and the Contractor shall be held responsible for the repair of such structures when broken or otherwise damaged.

Excavation normally shall be by open cut from the surface except as otherwise specified, or in special cases where crossing under trees, pavements, or structures. The Contractor may use tunnel methods if permitted in writing by the Engineer, provided his method of backfill is such, in the judgment of the Engineer, as to avoid any present or future injury to the tree, pavement, or structure. All excavation shall be performed in such a manner as to provide adequate room for the construction and installation of the work to the lines, grades and dimensions shown on the Plans.

The trench shall be excavated to a minimum of four inches below the final location of the pipe. This cut shall be filled to the level of the bottom quadrant of the pipe with Coarse Aggregate, 6A as specified herein, shaped and compacted to the pipe barrel. Bell holes shall be provided in the trench bottom at each joint to permit the joints to be made properly.

Whenever, in the opinion of the Engineer, it is necessary to explore and excavate to determine the location of existing underground structures, the Contractor shall make explorations and excavations for such purposes. These excavations will not be paid for separately, but shall be included in the cost of the item of work being performed. Any backfilling that may be required to be performed as a result of an exploratory excavation that is not part of the backfill associated with the work being undertaken, shall be included

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in the item of work being performed, with the exception of final trench restoration, which shall be paid for separately using appropriate items of work contained within the contract documents.

All excavated material approved by the Engineer as backfill material and imported backfill material shall be piled in a manner that will not endanger the work and that will avoid obstructing sidewalks and driveways or clear vision areas along roadways, driveways, or parking areas. All excavated material which is unsuitable for backfill shall be immediately removed from the site by the Contractor. Hydrants under pressure, manholes of any kind, valve boxes, curb stop boxes, fire and police call boxes, and other utility controls shall be left unobstructed and accessible until the work is completed. Gutters shall be kept clear, or other satisfactory provisions made, for proper drainage. Natural and man-made water courses shall not be obstructed. Disposal of excavated material, if required, shall be the Contractor's responsibility.

Hand methods for excavation shall be employed in locations shown on the Plans. In other locations the Contractor may use trench-digging machinery or employ hand methods.

**Pipe Undercut:**

In locations where in the opinion of the Engineer, the soil at the bottom of the trench is unstable, the Contractor shall excavate below the trench bottom to such depth as directed by the Engineer and refill with compacted Aggregate, 6A (limestone), or compacted Granular Material, Class II, as directed by the Engineer, to the level of the bottom quadrant of the pipe. If refill with compacted Aggregate, 6A (limestone) is required during sewer construction, it shall be placed for the entire sewer run, from manhole to manhole.

**Trench Opening:**

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

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In excavating for pipe lines, the excavation shall at all times be finished to the required grade in advance of the pipe line, but unless otherwise permitted in writing by the Engineer, not more than 50 feet of trench shall be open at one time in advance of the pipe. At no time shall more than 200 feet of trench be opened and incompletely backfilled. At the end of each day, no more than 10 feet of trench may be left open, and access to all drives shall be restored. This opening shall be surrounded by fencing and lighted barricades, or plated. The remainder of the trenching operation shall be available for safe vehicular and pedestrian traffic at all times.

The trench shall be so braced and drained that the workers may work therein safely and efficiently. It is essential that the discharge of the trench dewatering pumps be conducted to natural drainage channels, drains, or storm sewers. If trench water is pumped to natural drainage channels or drains, approved soil erosion and sedimentation controls shall be installed and maintained at the point of discharge. If trench water is pumped into storm sewers, filters shall be provided to prevent the flow of rocks, mud and other debris into the storm sewer line.

Sheeting, bracing, and shoring shall not be left in place after completion of the work except as required by the Engineer. Where the Engineer requires the sheeting, bracing, or shoring to be left in place it shall be cut off below the established surface grade as required by the Engineer.

The length of street which may be occupied by the construction work at any one time shall be subject to the approval of the Engineer and will be based on the requirements of use of the street by the public.

**Disposal of Water and Sewage:**

The Contractor shall remove by well points, pumping, bailing, or other acceptable method any water which may accumulate or be found in the trenches or other excavations to be made. The Contractor shall take all necessary precautions to keep the trenches and other excavations entirely clear of water and sewage during construction of pipe lines and structures. Newly placed concrete shall be adequately protected from injury resulting from ground water or sewage. No drainage ditches shall be placed within the area to be occupied by any structure except as permitted in writing by the Engineer.

The Contractor shall at all times have upon the work sufficient pumping equipment ready for immediate use to carry out the intent of this section.

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Where existing sewers, drains, or ditches are encountered in this work, adequate provisions shall be made for diverting their flow, so that the excavation will be kept dry. Upon completion of the construction work, the existing sewers, drains, or ditches shall be restored as directed by the Engineer.

**Crossing Existing Structures & Facilities:**

During the construction it may be necessary to cross under or over certain sewers, service leads, drains, culverts, water lines, gas lines, electric lines, and other underground structures or facilities, known or unknown. The Contractor shall make every effort to prevent damage to such underground structures and facilities. The Contractor shall not intentionally "dig through" existing facilities with the intention of replacing or repairing them after the proposed work is completed. Wherever such structures or facilities are disturbed or broken, they shall be restored to a condition equal to, or better than, the condition that existed prior the work being performed. All repairs shall acceptable to the owner and the City and shall be at the Contractor's sole expense. These crossings shall be made with a minimum of twelve inches of vertical clearance between facilities.

**Laying Pipe:**

Each pipe shall be inspected for defects prior to being lowered into the trench. The inside of each pipe and outside of each spigot shall be cleaned of any earth or foreign matter.

Proper implements, tools, and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and convenient prosecution of the work. All pipe and fittings shall be carefully lowered into the trench piece by piece by means of a derrick, ropes, or other suitable tools or equipment as recommended by the manufacturer, in such a manner as to prevent damage to them and their protective coatings and linings. Under no circumstances shall materials be dropped or dumped into the trench.

New sewer construction shall be plugged at the outlet, so as to not be connected into the existing system until it has been tested and accepted. Construction of sewers shall begin at the outlet end and proceed upgrade, unless otherwise directed by the plans or the Engineer. Pipe shall be laid on the prepared subgrade with the bell ends facing the direction of laying, unless otherwise directed by the Engineer.

The Contractor shall take every precaution to prevent foreign material from entering the pipe while it is being placed in the line. During laying operations, no debris, tools, clothing or other materials shall be placed in the pipe. At times when pipe laying is not in progress,

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the open ends of pipe shall be closed by a watertight plug. This provision shall apply during the break period as well as overnight. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry.

Pipe shall be jointed as specified elsewhere herein. The pipe shall be secured in place with approved backfill material tamped under it except at the bells. Pipe and fittings which do not allow a sufficient and uniform space for joints shall be removed and replaced with pipe and fittings of proper dimensions to insure such uniform space. Precautions shall be taken to prevent dirt from entering the joint space.

All pipe shall be laid at the correct line and grade as indicated by the grade stakes and offset line. The correct line and grade shall be maintained by the use of a laser alignment system. The staking shall be provided by the Engineer. No pipe shall be laid until a cut sheet for that pipe has been approved by the Engineer. Each pipe, as laid, shall be checked by the Contractor to insure that this result is obtained. The grade as shown on the Plans is that of the pipe invert for sewers; the work must conform to this profile. A variation of 1/4 inch from this profile grade will be deemed sufficient reason to cause the work to be rejected and re-laid. Sewer pipe alignment shall be maintained so as to not vary more than one-half inch from the correct line on pipes up to 36 inches in diameter nor more than one inch on pipes 42 inches in diameter and larger. Any pipe found out of line shall be re-laid properly by the Contractor.

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

#### Making Joints:

Mechanical means shall be used for pulling home all rubber-gasket pipe regardless of trench condition where manual means will not result in pushing and holding the pipe home. When a trench box or liner is used, a cable shall be used to pull the joints home and hold them in position.

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Where work is performed in wet trenches or trenches with running sand, the Contractor shall provide and use mechanical means for pulling the pipe home in making up the joint and for holding the pipe joints tight until completion of the line. Mechanical means shall consist of a cable placed inside or outside of the pipe with a suitable winch, jack, or come-along for pulling the pipe home and holding the pipe in position.

Where not required by these Specifications, manual means will be acceptable only if the joints can be pushed home and held.

Sewer pipe may not be cut when the cut end will be used in making a pipe joint. Cut ends may only occur in situations such as a manhole or headwall. Cut ends shall be carefully and neatly made with a saw, pipe cutter, or other approved means.

**Backfilling:**

Backfilling shall not be performed in freezing weather except by written permission of the Engineer, and it shall not be composed of frozen material. No fill shall be placed where the material already in the trench is frozen.

All pipe shall be bed on a four inch or thicker layer of compacted Granular Material, Class II as specified herein.

From the bedding to the pipe centerline backfill shall be carefully placed Granular Material, Class II, placed in maximum lift thicknesses of six inches, loose measure. Each lift shall be thoroughly compacted by hand tamps, pneumatic "pogo-sticks", or other approved methods to at least 95% of the material's maximum dry density at optimum moisture content as determined by the ASTM D 1557, Method C or the AASHTO T-180. Each lift shall extend the full width of the space between the pipe and trench, and the fill shall be brought up evenly on both sides of the pipe. The backfill under the haunches of the pipe shall be consolidated by the use of a tee-bar.

From the pipe centerline to the top of the pipe, backfill shall be Granular Material, Class II placed in maximum lift thicknesses of six inches, loose measure. Each lift shall be thoroughly compacted by hand tamps, pneumatic "pogo-sticks", or other approved methods to at least 95% of the material's maximum dry density at optimum moisture content as determined by the ASTM D 1557, Method C, or the AASHTO T-180.

From the top of the pipe to two feet above the top of the pipe, unless otherwise specified, backfill shall be Granular Material, Class II placed in a maximum lift thickness of twelve



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inches, loose measure. These lifts shall be thoroughly compacted by manually operated vibrating plate compactors, to at least 95% of the material's maximum dry density at optimum moisture content, as determined by ASTM D 1557, Method C or the AASHTO T-180.

From two feet above the top of pipe to the grade shown on the Plans and Details, or to the subgrade of roadway materials, or to the subgrade of surface structures, backfill shall be Class II granular material uniformly spread and machine tamped, unless otherwise specified in the appropriate trench detail. If machine tamping includes manually operated vibrating plate compactors or self-propelled vibrating rollers the backfill material shall be compacted in lifts not exceeding twelve inches, loose measure. If a backhoe-mounted compactor (hoe-pac) is employed, the backfill material shall be compacted in lifts of thirty-six inches, loose measure. Approval to use a particular machine tamping method will be withdrawn by the Engineer if the method causes injury to the pipe or adjacent structures or movement of the pipe. Each lift shall be thoroughly compacted to at least 95% of the material's maximum dry density at optimum moisture content as determined by ASTM D 1557, Method C, or AASHTO T-180. The Engineer may give consideration to giving written permission to increase the thickness of the lifts specified in this paragraph if satisfactory compaction is achieved and no undesirable side effects occur.

#### Concrete Cradle and Encasement for Sewers:

Where shown on the Plans, pipe shall be installed with a concrete cradle or encasement of Concrete, Grade X as shown on the Standard Details or plan sheets. Cradle or encasement shall be for the full run of the sewer, from manhole to manhole. Each pipe shall rest on a bed of Concrete, Grade X, shaped to fit the bottom of the pipe. After setting the pipe, the space between the outside of the pipe and the undisturbed trench bank shall be completely filled with Concrete, Grade X. Concrete, Grade X used for this purpose shall have a slump not exceeding two inches.

#### Manholes:

Excavation shall be carried to the depth and width required to permit the construction of the required base. The excavation width shall be greater than the base. The bottom of the excavation shall be trimmed to a uniform horizontal bed and be completely dewatered before any concrete is placed therein. Concrete shall be Grade S2. Precast manhole bases and precast bottom sections are allowed.

Precast concrete manholes shall be constructed of Concrete, Grade S2.

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Circular precast manhole sections shall be constructed in accordance with the Standard Detail Drawings. Manhole stack units shall be constructed on level poured-in-place bases, precast concrete bases, or precast concrete bottom sections.

Precast cone sections shall be constructed in accordance with the Standard Details. These units shall be eccentric for all manholes. All structures shall be topped with a minimum of one and a maximum of three brick or precast adjustment ring courses.

Manholes shall be constructed within 2-1/2 inches of plumb.

Frames and cover castings shall be set in full mortar beds and pointed on the structure interior to a smooth, brushed finish. The covers shall be set flush with sidewalk, roadway pavement, or ground surfaces. City of Ann Arbor Project Management Personnel shall be notified prior to the final paving of all private roads and parking lots so as to allow inspection of the final casting adjustments for all City utility structures. In gravel streets, covers shall be set six to eight inches below finished gravel surface.

Sewer pipes shall extend into structures a minimum of 1/2 inch and a maximum of 3 inches.

Flow channels for sewer structures shall be finished in accordance with the Standard Details. All flow channels shall be screeded and floated to a smooth, uniform surface and troweled to a hard surface finish.

Stubs for future sewer connections shall be furnished and placed by the Contractor as shown on the Plans and as directed by the Engineer. Connections shall be properly supported and braced when not resting on original ground so that any settlement will not disturb the connection. Stubs shall consist of one length of sewer pipe, of the size indicated on the Plans, with a watertight plug.

See Sewer Testing section for the requirement of the installation of a pipe nipple through the sewer manhole wall.

Drop Connections:

Where shown on the Plans or directed by the Engineer where a branch sanitary sewer is brought into a manhole more than 24 inches above the invert elevation in the manhole, a drop connection shall be provided in accordance with the Standard Detail Drawings.

Backfilling Around Manholes:

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As soon as practicable after a precast structure has been set, forms and debris have been removed from the structure, and the structure has been inspected and approved, the excavated area around the structure shall be backfilled up to the specified grade with Granular Material, Class II. No boulders, rocks, stones, masonry, lumber, or debris shall be allowed within the backfill.

**Sewer Testing:**

All sanitary sewers, including leads, 36 inches and smaller shall be air tested by the Contractor. All sanitary sewers greater than 36 inches shall be infiltration or exfiltration tested by the Contractor. The Engineer will decide whether infiltration or exfiltration testing is performed based upon ground water conditions. All sewers, except 4-inch and 6-inch leads, shall be television inspected by the Contractor. All PVC sanitary sewer mains shall be mandrel tested. All sewer must meet each test, in order (mandrel testing, air or infiltration/exfiltration, television inspection), before the next test is performed. The Contractor shall furnish all labor, equipment and materials necessary for testing. Only after all tests have been successfully completed, and acknowledged by the Engineer in writing, may the sewer be placed in service.

**Air Test:**

The air test can be dangerous. Lack of understanding, carelessness, or an improperly prepared line must be avoided. It is extremely important that the plugs be installed in such a way as to prevent blowouts. Sudden expulsion of a poorly installed or partially deflated plug can cause serious injury or damage. As a safety precaution, pressurizing equipment must include a relief valve set at not more than 10 psig. No one will be allowed in the manholes during testing.

In areas where ground water is known to exist and the sewer is to be air tested, the Contractor shall install a 1/2-inch diameter by approximately 10 inch long pipe nipple, through the manhole wall above one of the sewer lines entering the manhole. The pipe nipple shall be capped on the inside of the manhole at the time the sewer line is installed. Immediately prior to the performance of the air test, the ground water level shall be determined by removing the pipe cap, blowing air through the pipe nipple into the ground so as to clear it, and then connecting a clear plastic tube to the pipe nipple. The tube shall be held vertically and a measurement of the height in feet of water above pipe centerline shall be taken after the water stops rising in this plastic tube. The height in feet shall be divided by 2.31 to establish the pressure (in psig) that will be considered to be the average ground water back pressure.

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The normal sequence and time requirements for air testing are:

1. After a manhole-to-manhole section of line has been backfilled and cleaned, it shall be plugged at each manhole with pneumatic plugs. The design of the pneumatic plugs shall be such that they will hold against the line test pressure without requiring external blocking or bracing. There shall be three hose connections to the pneumatic plug. One hose shall be used only for inflation of the pneumatic plug. The second hose shall be used for continuously reading the air pressure rise in the sealed line. The third hose shall be used only for introducing low pressure air into the sealed line.
2. Low pressure air shall be introduced into the sealed line until the internal air pressure reaches 4.0 psig greater than the average back pressure of any ground water pressure that may be over the pipe. At least two minutes shall be allowed for the air pressure to stabilize. After the stabilization period, the pressurization hose shall be disconnected to prevent air from entering or escaping from the line.

There shall be a pressure gauge for reading the internal pressure of the line being tested. The gauge shall be capable of showing pressure as low as 0 psig up to no greater than 20 psig. In the 0-10 psig range the gauge shall be both calibrated and accurate to one-tenth of one pound and the gauge dial shall cover at least one-half of the complete dial range. This gauge shall have a tee fitting to allow simultaneous pressure reading by a City gauge.

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- The time requirement for the pressure to decrease from 3.5 to 2.5 psig (greater than the average back pressure of any ground water that may be over the pipe) shall not be less than the time given in the following table:

<u>Pipe Size</u>	VCP & RCP SEWERS	PVC SEWERS	
	<u>Minimum Holding Time Seconds/100 ft. Pipe</u>	<u>Holding Time (Seconds)</u>	<u>Minimum Holding Time (Min:Sec)</u>
4-inch	18	0.380 x Length	3:46
6-inch	42	0.854 x L	5:40
8-inch	72	1.520 x L	7:34
10-inch	90	2.374 x L	9:26
12-inch	108	3.418 x L	11:20
15-inch	126	5.342 x L	14:10
18-inch	144	7.692 x L	17:00
21-inch	180	10.470 x L	19:50
24-inch	216	13.674 x L	22:40
30-inch	288	21.366 x L	28:20
36-inch	360	30.768 x L	34:00

**Infiltration Test:**

The Contractor shall place temporary weirs for testing purposes in such manholes as necessary to measure the amount of infiltration. Test sections shall be no longer than 1,200 feet.

The allowable amount of infiltration shall not be more than 200 gallons per inch of pipe diameter per mile of sewer per 24 hours, including manholes. The Contractor shall repair all visible leaks regardless of the results of the infiltration test.

If the allowable limit of infiltration is exceeded on any test section, the Contractor shall reconstruct or repair the defective portion of the sewer, and re-test.

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**Exfiltration Test:**

The standpipe method will be used from manhole to manhole for the length of pipe to be tested. A hydrostatic head of 10 ft. to the sewer's average centerline elevation will be required, with adjustments for external submergence due to water in the trench. The Engineer will establish time durations and procedures for each test. The maximum allowable exfiltration rate will be 200 gallons per inch of pipe diameter per mile of sewer per 24 hours including manholes. Upon completion of this test on a sanitary sewer, the Contractor shall pump all water out of the downstream manhole to a storm sewer.

**Television Inspection:**

A video inspection must be approved prior to the acceptance of the sewers, and prior to any building connections being made. The Engineer shall be given 24 hours notice so that an Inspector may witness the video inspection. All sewer lines are to be thoroughly cleaned prior to video inspection, by jetting of the lines or other approved methods. Video inspection shall consist of wetting the invert of the section by pouring clean water in the upstream manhole until it appears in the downstream manhole, and then, after the water has stopped flowing, passing a video camera **upstream** through the section. The camera shall be connected to a monitor and the results recorded in DVD format. The inspection record (DVD) shall indicate the date, the section tested, and the actual distance from the beginning manhole to each tee or wye, and each visible defect. The DVD shall be furnished to the Engineer for further review and final approval.

The video inspection will be deemed satisfactory if there are no visible defects, including, but not limited to: dips or low spots, high spots, deviations in horizontal or vertical alignment, joint offsets, leaks or cracks and there is no debris or other foreign material in the sewer system.

**Sewer Repairs:**

If a sewer repair is required as a result of damage during construction operations, air test failure, or video inspection failure, the Contractor shall expose the sewer pipe and perform the required correction(s), as specified herein and as directed by the Engineer. The Contractor shall be fully responsible to provide a written plan of all proposed activities associated with any repair(s) for the review and approval of the Engineer. All repairs proposed shall be effective. The Engineer's acceptance of a proposed repair plan shall not be construed as acceptance of any associated result. The Contractor is, and shall remain responsible, for all work until such time as it is formally accepted in writing by the Engineer.

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If the repair is required due to the pipe being out of alignment or off grade, the pipe shall be adjusted so as to be placed in proper alignment and grade. Aggregate, 6A (limestone) shall be carefully placed under the haunches of the realigned pipe and compacted by the use of a tee-bar. From the haunches of the pipe, backfilling shall be performed as specified elsewhere herein.

If the pipe cannot be satisfactorily realigned or an open joint reset; or if the pipe is cracked, broken, or permanently deflected, the affected pipe shall be removed and replaced with the same pipe material. The pipe to be removed is to be sawed on each side of the damaged section in a neat and workmanlike manner without damage to the adjacent pipe. The replacement pipe section shall fit flush to the remaining pipe at each end. These sawed joints shall be coupled using a flexible pipe coupling and stainless steel shear ring. These joints shall be encased to the pipe centerline with Concrete, Grade X one foot on either side of the flexible coupling. The remaining pipe backfill shall be performed as specified elsewhere herein.

**e. Measurement and Payment.** The completed work as described will be measured and paid for at the contract unit price using the following contract items (pay items):

<u>Contract Item (Pay Item)</u>	<u>Pay Unit</u>
Sewer, CI C 76 IV, ___ inch, Tr Det _____	Foot
Sewer, PC 350 D.I. Pipe, ___ inch, Tr Det _____	Foot
Dr Structure, Manhole, Type I, ___ inch dia, Sanitary.....	Each
Dr Structure, Manhole, Type I, ___ inch dia, Sanitary, Add Depth.....	Foot
Dr Structure, Manhole, Type III, ___ inch dia, Sanitary.....	Each
Dr Structure, Manhole, Type III, ___ inch dia, Sanitary, Add Depth.....	Foot
Dr Structure, Manhole, Type IV (Sampling), ___ inch dia, Sanitary.....	Each
Drop Connection, ___ inch.....	Foot
Pipe Undercut & Refill (Granular Material, Class II) .....	Cubic Yard
Pipe Undercut & Refill (6A, limestone) .....	Cubic Yard

Sewer Pipe

Sewer pipe as specified shall be measured in place by length in lineal feet (LF) from center of manhole to center of manhole. Payment will include, but not be limited to; excavation; furnishing the pipe; all labor needed for installation and delivery; any needed equipment

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and tools for the prosecution of the work; removal and proper disposal off-site of all excess or unsuitable excavated material; any needed sheeting, shoring and bracing; the installation of water-tight plugs; protection of all existing utilities and service connections; connections into existing structures; bulkheading existing connections that are no longer needed in existing manholes; pipe bedding; furnishing an approved geotextile separator; backfilling per the trench details and the requirements specified herein; cleaning; video inspection; and testing.

### Manholes

Manholes of the detail and depth specified will be paid for at the Contract unit price for each unit installed. Payment includes, but shall not be limited to; furnishing the labor, equipment and materials for all necessary excavation; any needed sheeting, shoring and bracing; properly disposing of surplus or unsuitable excavated material; backfilling and compaction; and, constructing the structure complete, including pipe connections and structure cleaning, up to 10 feet of drainage structure depth.

Payment for additional depth for drainage structures includes, but shall not be limited to; furnishing the labor, equipment, and materials for all necessary excavation; any needed sheeting, shoring and bracing; disposing of surplus excavated material; backfilling and compaction; and constructing the structure complete, including pipe connections and structure cleaning, for the portion of the structure which is deeper than 10 feet. Payment for adjusting of manhole frames and covers shall be included in payment for the manhole. The manhole frames and covers will be paid for separately.

### Drop Connections

Payment for drop connections shall be based on vertical feet (VF) installed. Payment includes, but shall not be limited to; furnishing all labor, equipment and materials for all necessary excavation; any needed sheeting, shoring and bracing; proper removal and disposal off-site of surplus and unsuitable excavated material; pipe, fittings, and concrete; backfilling and compaction; and, connections needed to complete this item of work. Vertical footage will be measured from the bottom invert of the drop connection to the top invert of the drop connection.

### Pipe Undercut & Refill

Payment for Pipe Undercut & Refill will be based on cubic yards (CY) as measured compacted in place, as described above. Payment will include the additional excavation,



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placement of refill material compacted in place, and all related work. Measurement for refill width will be the outside diameter of the pipe barrel plus two feet. Measurement for depth will be from the bottom of the excavation to the bottom of the pipe barrel. The Contractor shall note that undercut quantities shown on the Bid Form are estimates only. The quantities of undercut may vary significantly more or less depending on field conditions at the time of construction. Any variation from the bid amount shall not be a basis of claim for additional compensation pursuant to Sections 103.02.B or 104.10 .

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- a. Description.-** This work shall consist of supplying and applying an Engineer-approved coating system on all inner surfaces of the sanitary diversion chamber. The work includes, but is not limited to; submittal of all required information; preparation and cleaning of all surfaces to be coated; applying coating materials; furnishing and operating all needed application equipment of any nature; testing of the finished coating system; proper removal and off-site disposal of any unused materials; removing any epoxy coating applied on unintended surfaces; and any other required work to properly complete the installation.
- b. Materials.-** The protective, 100% solids, ultra-high build, epoxy coating material to be provided shall be from one of the following manufacturers:

Manufacturer:	Product:
Raven Lining Systems 13105 E. 61 <sup>st</sup> Street, Suite A Broken Arrow, Oklahoma 74012	Raven 405
Spectrashield 4527 Sunbeam Road Jacksonville, Florida 32257	SpectraShield

- c. Submittals.-** All materials and procedures required to establish compliance with the specifications shall be submitted to the Engineer for review and approval a minimum of 14 calendar days prior to the intended start date of coating system application. Submittals shall include, but are not limited to:
1. Technical Data Sheet on each product to be used;
  2. Material Safety Data Sheet (MSDS) for each product to be used;
  3. ASTM References (as applicable); and,
  4. CIGMAT Evaluation.
- d. Cleaning and Surface Preparation.-** Surface preparation methods may include high pressure water cleaning, hydro blasting, abrasive blasting, detergent-water cleaning,

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or other suitable cleaning and surface preparation method and shall be suited to provide a surface compatible for installation of the liner system.

The chosen surface preparation method shall produce a clean and sound surface with no laitance, loose concrete, curing compound, contaminants or debris, and shall display a surface profile suitable for application of liner system.

Preparation shall include the patching of all visible cracks, holes, voids on the surfaces in the sanitary diversion structure. Concrete surface defects, such as bug holes, honeycombs, cracks and voids shall be filled flush and true with Engineer-approved polyurethane adhesive (crack-filling material) or a grouting or patching compound.

The Contractor shall cover and protect all manhole steps, guide channels, diversion plates, or any other non-concrete surface within the diversion chamber prior to the application of the epoxy coating material(s). The protective covering shall be tightly applied and shall be completely effective in ensuring epoxy coating is not applied to unwanted areas.

- e. Material Application and Construction Methods.-** The Applicator shall take appropriate action to comply with all local, state and federal regulations including those set forth by OSHA, EPA, and any other applicable authorities.

The sanitary diversion structure shall have been allowed to cure for a minimum of 28 days prior to commencing installation of the liner system. The epoxy coating shall be applied and accepted by the Engineer prior to allowing flow through the sanitary diversion chamber.

Prior to performing any work, perform inspection of structure to determine need for protection against hazardous gases or oxygen-depleted atmosphere. Application procedures shall strictly conform to recommendations of the manufacturer, including materials handling, mixing, environmental controls during application, safety and spray equipment.

Spray equipment shall be specifically designed to accurately ratio and apply the liner system. All spray equipment shall be in good working order and function as intended without excessive adjustments or repairs. The Applicator shall demonstrate the proper performance of the application system prior to applying any coating materials.

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The protective epoxy coating shall be applied a minimum of 250 mils (dry film thickness) when completed. A permanent identification and date of work performed shall be affixed to the inside of the structure in a readily visible location.

- f. **Inspection.**- The final liner system shall be completely free of pinholes or voids. Liner thickness shall be the minimum value as described herein. The Applicator shall perform a High-voltage Spark Test in the presence of the Engineer as described herein in order to detect defects within the applied coating.

High Voltage Spark Test.- After the protective coating has set hard to the touch it shall be inspected with high-voltage holiday detection equipment. The surface shall first be dried, an induced holiday shall then be made on to the coated concrete or metal surface and shall serve to determine the minimum/maximum voltage to be used to test the coating for holidays within the diversion chamber. The spark tester shall be initially set at 100 volts per 1 mil (25 microns) of film thickness applied but may be adjusted as necessary to detect the induced holiday (refer to NACE RPO188-99). All detected holidays shall be marked and repaired by abrading the coating surface with grit disk paper or other hand tooling method. After abrading and cleaning, additional protective coating material can be hand applied to the repair area. All touch-up/repair procedures shall follow the protective coating manufacturer's recommendations.

A final visual inspection of the completed coating system shall be made by the Engineer. Any deficiencies in the finished coating system shall be marked by the Engineer and all repairs shall be made by the Applicator. The Engineer shall approve all repairs.

The sanitary diversion chamber shall not become operational until the final inspection and acceptance of the applied coating system has taken place.

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**g. Measurement and Payment.-** The completed work as measured will be paid for at the contract unit price for the following contract item (pay item):

<u>Contract Item (Pay Item)</u>	<u>Pay Unit</u>
Epoxy Coating, Protective, Field Applied .....	Lump Sum

"Epoxy Coating, Protective, Field Applied " will be measured by the unit Lump Sum. The item of work shall be paid for at the contract unit price, which shall be payment in full for all labor, material and equipment needed to accomplish this work.

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**MATERIAL AND APPLICATION REQUIREMENTS FOR CERAMIC EPOXY COATED  
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- a. Description.-** This work shall consist of supplying ceramic epoxy coated sanitary sewer pipe and fittings.
- b. Condition of Ductile Iron Prior to Surface Preparation.-** All ductile pipe and fittings shall be delivered to the application facility without asphalt, cement lining, or any other lining on the interior surface. Because removal of old linings may not be possible, the intent of this specification is that the entire interior of the ductile iron pipe and fittings shall not have been lined with any substance prior to the application of the specified lining material and no coating shall have been applied to the first six inches of the exterior of the spigot ends.
- c. Lining Material.-** The standard of quality is Protecto 401™ Ceramic Epoxy. The material shall be an amine cured novolac epoxy containing at least 20% by volume of ceramic quartz pigment. Any request for substitution must be accompanied by a successful history of lining pipe and fittings for sewer service, a test report verifying the following properties, and a certification of the test results.
- A. A permeability rating of 0.00 when tested according to Method A of ASTM E-96-66, Procedure A with a test duration of 30 days.
- B. The following test must be run on coupons from factory lined ductile iron pipe:
- \* ASTM B-117 Salt Spray (scribed panel) - Results to equal 0.0 undercutting after two years.
  - \* ASTM G-95 Cathodic Disbondment 1.5 volts @ 77°F. Results to equal no more than 0.5 mm undercutting after 30 days.
  - \* Immersion testing rated using ASTM D-714-87.
    - 20% Sulfuric acid—No effect after two years.
    - 140°F 25% Sodium Hydroxide—No effect after two years.
    - 160°F Distilled Water—No effect after two years.
    - 120°F Tap Water (scribed panel)—0.0 undercutting after two years with no effect.
  - \* ASTM G-22 90 Standard practice for determining resistance of Synthetic Polymeric materials to bacteria. The test should determine the resistance to growth of Acidithiobacillus Bacteria and should be conducted at 30 degrees centigrade for a period of 7 days on a minimum of 4 panels. The growth must be limited only to trace amounts of bacteria.

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C. An abrasion resistance of no more than 3 mils (.075 mm) loss after one million cycles using European Standard EN 598: 1994 Section 7.8 Abrasion Resistance.

- d. Application.-** The lining shall be applied by a certified firm with a successful history of applying linings to the interior of ductile iron pipe and fittings. All applicators must be independently inspected at least two times per year to insure compliance with the requirements of this specification. This inspection must be coordinated and reviewed by the manufacturer of the lining material and any deviation from the application and/or quality requirements shall be corrected by the applicator. All inspections shall be in writing and a permanent record maintained.

Surface Preparation:

Prior to abrasive blasting, the entire area to receive the protective compound shall be inspected for oil, grease, etc. Any areas with oil, grease, or any substance that can be removed by solvent, shall be solvent cleaned to remove those substances. After the surface has been made free of grease, oil or other substances, all areas to receive the protective compounds shall be abrasive blasted using sand or grit abrasive media. The entire surface to be lined shall be struck with the blast media so that all rust, loose oxides, etc., are removed from the surface. Only slight stains and tightly adhering oxide may be left on the surface. Any area where rust reappears before lining must be re-blasted.

Lining

After surface preparation and within 12 hours of surface preparation, the interior of the pipe shall receive 40 mils nominal dry film thickness. No lining shall take place when the substrate or ambient temperature is below 40°F. The surface also must be dry and dust free. If flange pipe or fittings are included in the project, the lining shall not be used on the face of the flange.

Coating of Bell Sockets and Spigot Ends

Due to the tolerances involved, the gasket area and spigot end up to 6 inches back from the end of the spigot end must be coated with 6 mils nominal, 10 mils maximum, Protecto 401™ Joint Compound. The Joint Compound shall be applied by brush to ensure coverage. Care should be taken that the Joint Compound is smooth without excess buildup in the gasket seat or on the spigot

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ends. Coating of the gasket seat and spigot ends shall be performed after the application of the lining.

#### Number of Coats

The number of coats of lining material applied shall be as recommended by the lining manufacturer. However, in no case shall this material be applied above the dry thickness per coat recommended by the lining manufacturer in printed literature. The maximum or minimum time between coats shall be that time recommended by the lining material manufacturer. To prevent delamination between coats, no material shall be used for lining which is not indefinitely recoatable with itself without roughening of the surface.

#### Touch-Up and Repair

Protecto 401™ Joint Compound shall be used for touch-up or repair in accordance with manufacturer's recommendations.

- e. Inspection and Certification.-** All ductile iron pipe and fitting linings shall be checked for thickness using a magnetic film thickness gauge. The thickness testing shall be performed using the method outlined in SSPC PA-2 Film Thickness Rating.

The interior lining of all pipe barrels and fittings shall be tested for pinholes with a non-destructive 2,500 volt test. Any defects found shall be repaired prior to shipment.

Each pipe joint and fitting shall be marked with the date of application of the lining system along with its numerical sequence of application on that date and records maintained by the applicator of his work.

#### Certification

The pipe or fitting manufacturer must supply a certificate attesting to the fact that the applicator met the requirements of this specification, and that the material used was as specified.



CERAMIC EPOXY COATING OF DUCTILE IRON SEWER PIPE 850C

CITY OF ANN ARBOR  
DETAILED SPECIFICATION  
FOR

**MATERIAL AND APPLICATION REQUIREMENTS FOR CERAMIC EPOXY COATED  
DUCTILE IRON PIPE FOR SEWER SERVICE**

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- f. Handling.-** Lined pipe and fittings must be handled only from the outside of the pipe and fittings. No forks, chains, straps, hooks, etc. shall be placed inside the pipe and fittings for lifting, positioning, or laying. The pipe shall not be dropped or unloaded by rolling.

Care should be taken not to let the pipe strike sharp objects while swinging or being off loaded. Ductile iron pipe should never be placed on grade by use of hydraulic pressure from an excavator bucket or by banging with heavy hammers.

- g. Measurement and Payment.-** All costs associated with conformance to the requirements of this Detailed Specification will not be paid for separately, but shall be included in the respective items of work.

CITY OF ANN ARBOR  
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**SEWER FLOW CONTROL**

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**a. Description.-** The work covered by this Detailed Specification shall consist of furnishing all labor, supervision, tools, equipment, appliances, materials, incidental items, and the installation, operation, and maintenance needed to perform all operations in connection with the diversion of flow and bypass pumping of sanitary sewage for cleaning and inspecting of sewers and manholes, sewer rehabilitation procedures, and connections of newly constructed sewers to existing manholes with live flow. The purpose of which is to provide un-interrupted sewerage service at all times and to prevent sewage overflows.

It is the intent of this project to divert all flow within the work zone between the northside and southside interceptors by installing plugs for the proposed diversion chamber construction. By-pass pumping is expected to be necessary for the final connection between the existing 24-inch sanitary sewer system and the proposed 24" sanitary sewer that runs north-south across Fuller Road between MHs s-0 and S-2.

When working inside manholes or sewer, the Contractor shall exercise caution and comply with Occupational Safety and Health Administration (OSHA) and City requirements for working in confined spaces.

The Contractor shall manage, plan, and execute their operations such that there will be no backups, leaks, or unauthorized discharges of sewerage. The Contractor shall be completely responsible for the proper clean-up and any environmental remediation as may be required by the City or the Michigan Department of Environmental Quality (MDEQ) for any backup, leak, spill, or sanitary sewerage overflow.

**b. Submittals.-** The Contractor shall provide a detailed Sewer Flow Control Plan to the Engineer for review and acceptance prior to the start of any flow control work. This plan must include descriptions outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing flow. The Sewer Flow Control Plan must be specific, including such items as schedules, locations, elevations, capacities of the equipment, materials, and all other incidental items necessary and/or required to ensure proper protection of the facilities, including protection of existing structures and pipes, and compliance with the requirements and conditions specified in these Contract Documents. The flow control plan shall be submitted to the Engineer for review and approval in accordance with Section 104.02 of the 2012 edition of the Michigan Department of Transportation Standard Specifications for Construction. No construction shall begin until all provisions and requirements have been reviewed and accepted by the Engineer.

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For each submittal and re-submittal, the Contractor shall allow at least 14 calendar days from the date of the submittal to receive the Engineer's acceptance or request for revisions. The Engineer's comments shall be incorporated into the re-submitted plans, calculations, and descriptions. The Engineer's acceptance of the plan is required before beginning the work. Re-submittals shall be reviewed and returned to the Contractor within 14 calendar days. Required revisions will not be a basis of payment for additional compensation, extra work, or an extension of contract time. The Contractor shall include time for this entire review process in their schedule.

Sewer Flow Control Plan submittal shall include at a minimum:

1. Overall flow control plan and sequence of construction;
2. Any needed traffic control items required for the installation, maintenance, operation, and removal of the flow control system; all traffic control devices shall meet the requirements of Chapter 6 of the Michigan Manual of Uniform Traffic Control Devices;
3. Flow control schedule including times when the flow control system shall be temporarily shut down and flow allowed to return to normal operations;
4. Overall plan for removal of flow control system during emergency situations, if needed;
5. Plan for providing redundancy for all aspects of the system especially the plugs;
6. Safety Program for confined space entry and procedure for entering manholes and installing plugs under live flow conditions;
7. Emergency clean-up plan should a spill occur or backups in the system occur. The plan must include contact names and 24 hour phone numbers;
8. Procedure for continuous (24 hour) monitoring of system, including verifying that plugs are sealed and lateral bypass pumping system is operating. The plan is to include type and location of level sensors, method of installation, set elevations of sensors, and continuous monitoring system;
9. Sewer plug types, method of installation and removal, anchors and restraints, and hydraulic head limits;

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10. Bypass pump sizes, capacities, power requirements, and number of each size to be provided at each manhole including redundancy;

11. Calculations giving flow capacity provided by each pump given the system's Total Dynamic Head (TDH), including the calculations that are used to derive the system TDH. This data should also include the calculations determining what the Net Positive Suction Head available is in comparison to the Net Positive Suction Head required by each pump. Pump curves shall be submitted;

12. Number, size, material, and location of bypass pumping suction and discharge piping, procedure for protecting lines, and location of bypass pumping discharge manhole;

13. Environment protection including pump containment and leak detection;

14. Method of protecting discharge manholes or structures from erosion and damage; and,

15. Method of noise control for each pump.

**c. Flow Diversion Equipment.-** Provide materials and equipment suitable for, and known to be reliable to meet, the flow diversion requirements as shown on the Drawings and as needed for the Contractor's operations.

The plug shall be a temporary plug that allows for quick removal in case of emergency or wet weather situation and re-installation after wet weather event has passed. Plugs shall be capable of withstanding minimum static head pressure of 15 feet. Plugs shall include form or bracing, anchoring, or restraint to keep plugs properly installed. Plugs should be of the type capable of being installed under live flow conditions and in depths exceeding 10 feet as shown on the Drawings. Plugs should be able to be installed in either the incoming or outgoing pipe in a manhole and allow for quick removal under surcharged conditions.

Pressure gages shall be installed with the plugs to continuously monitor the plugs and adjust the air pressure as needed to maintain full blockage of flow.

An ultrasonic level sensor shall be installed, at a minimum, at the location where the by-pass pumps are installed so as to provide information on the adequacy of the performance of the by-pass pumping system. The Contractor may elect to install sensors

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in other locations at their expense if they so choose. The Contractor shall be responsible for the installation and maintenance of the sensors. The level sensors shall provide continuous level readings that the Contractor shall be able to review remotely to monitor the level in the system during flow diversion. The level sensors shall provide notifications and alarms to allow the Contractor time to remove the plugs should an emergency or a wet weather event occur.

**d. Bypass Pumping Equipment.-** Provide materials and equipment suitable for, and known to be reliable to meet, the bypass pumping requirements.

The pumps must be capable of passing a minimum of a 3-inch solid. All pumps must be constructed to allow dry running for long periods of time to accommodate the cyclical nature of effluent flows.

Equipment used for bypass pumping shall be sufficient to handle anticipated average and peak flows from each sewer. The Contractor shall maintain sanitary sewer flows within their bypass pumping system, including all wet weather flows.

The locations and approximate flow rates for each of these laterals is as follows:

<u>Structure</u>	<u>Outlet Size</u>	<u>Peak Flow* (cfs)</u>
MH s-1	24"	3.1

\*Peak flow rate is based on the City's monitoring data from 2016 & 2017.

The Contractor shall take into account seasonal variations and include an appropriate safety factor above the indicated peak flow values in sizing pumping equipment.

For sanitary sewerage, bypass piping shall be PVC Schedule 80, or equivalent, with solvent welded joints; or HDPE with butt-fused joints. The Contractor shall perform hydrostatic testing of bypass pump discharge pipes in accordance with ASTM F2164 for HDPE or ASTM F2261 for PVC pipe, prior to operating bypass pumping system to ensure structural integrity of pipeline. Any defects or leaks found during testing shall be repaired and the pipeline shall be re-tested until results are satisfactory in accordance with the ASTM standard, and as acceptable to the Engineer.

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**1. Redundant Equipment.-** The Contractor shall have redundant flow diversion equipment including, but not limited to, plugs and level sensors, available for immediate use at the job site at all times in the event of a failure.

Any damage to the Contractor's equipment, sewer system, or delays to the Contractor's operations due to equipment or plug failure/leakage shall be the Contractor's sole responsibility and no additional payment shall be made for these occurrences. The Contractor shall take all necessary precautions to verify that the plugs and flow diversion plan is operational prior to performing the work.

The Contractor shall have redundant bypass pumping equipment installed and ready for immediate operation and use in the event of an emergency or primary system breakdown or failure. The standby system shall be capable of pumping dry weather and peak flow. The standby pump(s) shall not be considered as any part of the primary system as designed for peak flow. The Contractor shall also furnish and have available onsite, and ready for operation, redundant pumping ancillary equipment in case of any failure of the pumping system including piping, electrical equipment, pipe appurtenances, etc. Redundant pumping facilities shall also include having a backup power generator in case the primary power source fails.

The Contractor shall not obstruct flows in the sewer unless the primary and redundant equipment is onsite and in operable condition and authorization has been granted by the Engineer.

**e. Flow Diversion.-** The Contractor shall divert flows from the 42-inch Southside Interceptor by installing a plug on the downstream side of the existing sanitary diversion structure s-1 and diverting the flow to the existing 42" Northside Interceptor outlet sewer while the proposed diversion chamber and San MH-3 is being constructed. The Southside Interceptor 42-inch pipe passes through the existing sanitary diversion structure s-1 with the top half of the pipe removed. The Southside Interceptor in this manhole is approximately 3.6 feet higher than the outlet pipe to the Northside Interceptor.

The Contractor shall divert flows from the 42-inch Southside Interceptor by installing a plug on the downstream (east) side of the existing sanitary diversion structure s-1 and diverting the flow to the Northside Interceptor through the partially removed pipe. This diversion will occur for the majority of the work for the proposed diversion chamber and downstream sanitary system.

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The Contractor shall install temporary traffic control measures, as needed, to install the by-pass pumping system. Traffic shall be maintained as outlined elsewhere in the contract documents and as approved by the Engineer.

**The Contractor shall install plugs and level sensors and test the system for a minimum of 48 hours prior to the start of any work requiring diversion of the existing 24” sanitary sewer.** The Contractor, City, and Engineer shall review the flow diversion during the testing period, including flow levels in the manholes. The Contractor shall not tap San. MH s-0 until acceptance of the diversion test.

**f. Noise Control.-** All noise generated by the bypass pumping operation shall not exceed the sound limits established in the Ann Arbor City Code, and shall follow necessary procedures as required for temporary exemptions, as defined in Detailed Specification “Hours of Work.”

**g. Flow Diversion and Bypass Pumping Completion.-** At the end of the flow control operation, and after receipt of written permission from the Engineer, the Contractor shall remove all flow diversion and bypass pumping equipment, including level control system, temporary power equipment, and suction/discharge piping in a manner that permits the sewage flow to return to normal without overflowing to the environment, surcharging, or causing other major disturbances downstream. The Contractor shall restore all disturbed areas and structures, and restore all pavement in accordance with the project requirements and as directed by the Engineer.

The duration of the bypass pumping shall be determined by the Contractor as needed to perform the work under this contract while maintaining un-interrupted sewage service.

**h. Flow Control Precautions.-** When flow in a sewer line is bypassed or plugged, sufficient precautions must be taken to protect the sewer liner and the Contractor’s operations from damage that might result from sewer surcharging. Further, precautions must be taken to ensure that sewer flow control operations do not cause flooding or damage to public or private property being served by the sewers involved. At no time shall sewage be pumped in or allowed to flow into a catch basin, storm sewer, or open watercourse.

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**i. Measurement and Payment.-** The completed work shall be paid for at the contract unit price for the following contract pay item:

<u>Contract Pay Item</u>	<u>Pay Unit</u>
Sewer Flow Control .....	Lump Sum

The contract unit price for this item shall include all labor, supervision, tools, permits, shop drawing submittals, materials, equipment, operation, any incidental items, and all other work as noted on the Drawings and as specified herein to allow the Contractor to perform the work of diverting and bypass pumping flows as detailed herein.

The installation, maintenance, operation, monitoring, and removal of the level sensors shall not be paid for separately, but shall be included in the item of work "Sewer Flow Control."

The cost for the sewer flow control shall be paid for as a Lump Sum item regardless of the duration, number of, and/or duration of the wet weather events encountered, flow encountered, weather conditions, or number of times the sewer plugs may need to be removed and/or re-installed .

30% of the lump sum shall be paid for Sewer Flow Control following the initial installation, 48-hour test, and acceptance of the system by the Engineer. The remainder of the cost shall be paid for at the conclusion of all flow diversion activities and after the removal of all equipment from the site.



DETAILED SPECIFICATION  
FOR  
**PERMANENT PAVEMENT MARKING MATERIALS**

PMK:MKB/AA:MGN

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APPR:MWB:CRB:05-25-18

FHWA:APPR:06-12-18

12/14/18

**Delete the content of section 920, on page 890 of the 2012 Standard Specifications for Construction in its entirety and replace it with the following:**

**920.01. Marking Materials.** Select pavement marking materials from the Qualified Products List unless specified otherwise by special provision in the contract.

When selecting preformed thermoplastic products, ensure preformed thermoplastic materials have a thickness of 90 mils for surface applications and a thickness of 125 mils for recessed applications. For black liquid shadow markings and blue markings used in parking areas, choose a specified binder material and color from the Qualified Products List or select a white specified binder material from the Qualified Products List and tint the product to the appropriate color.

Use liquid applied pavement marking materials manufactured in the previous 12 months or within the shelf-life directed by the manufacturer, whichever is less. Use solid applied materials within the shelf-life directed by the manufacturer. Provide certification that liquid and solid applied pavement marking materials have been stored per the manufacturer's requirements. Materials not in compliance will be rejected and removed at the Contractor's expense.

Pavement marking materials must meet the general packaging and labeling requirements of subsection 920.01.A, and applicable specific material requirements of subsection 920.01.B.

**A. General Packaging and Labeling.** Material containers or packages must be marked on the tops and sides, using a durable, weather-resistant marking. Include the following information:

1. Manufacturer's name and address,
2. Description of the material,
3. Product identification number,
4. Lot or Batch number,
5. Date of manufacture,
6. Volume and
7. Weight.

**B. Packaging and Labeling for Cold Plastic and Thermoplastic Markings.**

1. **Cold Plastic.** Containers or packages of cold plastic material and the core of each roll must be marked with the information specified in subsection 920.01.A.
2. **Thermoplastic.** In addition to the requirements of subsection 920.01.A, thermoplastic material must be packaged in non-stick containers, and labeled with "heat to manufacturer-recommended temperature range," or a Department-approved equal.

**920.02. Glass Beads and Wet Reflective Beads/Elements.**

**A. Glass Bead and Wet Reflective Bead/Element Packaging and Labeling.** Glass beads and wet reflective beads/elements must be packaged in moisture resistant bags and labeled to include the following information:

1. Manufacturer's name and address,
2. Shipping point,
3. Trademark or name,
4. The wording "Glass Beads" or "Elements",
5. Specification number,
6. Weight,
7. Lot or Batch number, and
8. Date of manufacture.

Drop-on AASHTO M247 Type I beads, herein referred to as standard glass beads, must meet the general requirements of subsection 920.02.B and the applicable requirements for specific applications of subsection 920.02.D. Wet reflective beads/elements must meet the general requirements of subsection 920.02.C and the applicable requirements for specific applications of subsection 920.02.D. Large glass beads must meet federal specification TTB-1325 for a Type 4 glass bead.

All glass beads and wet reflective beads/elements to be used on Federal-aid projects must contain no more than 200 parts per million of arsenic or lead, as determined in accordance with Environmental Protection Agency testing methods 3052, 6010B, or 6010C.

**B. General Requirements for Standard Glass Beads.** Standard glass beads must meet the physical characteristics and gradation requirements specified in Table 920-1, unless otherwise specified in subsection 920.02.D for specific applications.

<b>Table 920-1 General Requirements for Standard Glass Bead</b>	
<b>Physical characteristics (MTM 711)</b>	
General Appearance	Transparent, clean, smooth, free from milkiness, pits, or excessive air bubbles
Shape	Spherical with $\geq 75\%$ true spheres

Color	Colorless, very light gray, very light gray tinge, or bright white
Index of Refraction	≥1.50
Alkalinity	≤2.0
<b>Gradation Requirements (MTM 711)</b>	
<b>Sieve Size (No.)</b>	<b>Total Percent Passing</b>
20	100
30	75–95
50	15–35
100	0–5

C. **General Requirements for Wet Reflective Beads/Elements.** Wet reflective beads/elements must meet the retroreflectivity requirements specified in Table 920-2.

<b>Table 920-2</b>		
<b>General Wet Reflective Bead/Element Requirements</b>		
<b>Average Initial Retroreflectivity at 30 meter geometry in mcd/lux/m<sup>2</sup></b>		
Test Method	Color	
	White	Yellow
Dry (ASTM E 1710)	700	500
Wet Recovery (ASTM E 2177)	250	200
Wet Continuous (ASTM E 2832)	100	75

D. **Glass Bead and Wet Reflective Bead/Element Requirements for Specific Applications.** For specific applications, glass beads and wet reflective beads/elements must be as follows:

1. For recessed longitudinal markings, use a double drop system of large and standard glass beads, a double drop system of wet reflective beads/elements and standard glass beads, or an Engineer-approved alternate.
2. **Waterborne and Low Temperature Waterborne.** Standard and large glass beads for use with waterborne marking material and low temperature waterborne marking material require a moisture resistant coating and a silane coating. The type, gradation, and application rates for wet reflective beads/elements used with waterborne and low temperature waterborne marking materials must meet the waterborne manufacturer's recommendations.
3. **Regular Dry.** Standard and large glass beads for use with regular dry marking material may have a moisture resistant coating, a silane coating, or both. The type, gradation, and application rates for wet reflective beads/elements used with regular dry marking materials must meet the regular dry manufacturer's recommendations.

4. **Thermoplastic.** Standard and large glass beads for thermoplastic marking material must have a moisture resistant coating. The type, gradation, and application rates for wet reflective beads/elements used with thermoplastic marking materials must meet the thermoplastic manufacturer's recommendations.
5. **Sprayable Thermoplastic.** The type, gradation, and application rates for standard and large glass beads and wet reflective beads/elements used with sprayable thermoplastic marking material must meet the sprayable thermoplastic manufacturer's recommendation.
6. **Polyurea.** The type, gradation, and application rates for standard and large glass beads and wet reflective beads/elements used with polyurea marking material must meet the polyurea manufacturer's recommendation.
7. **Modified Urethane.** The type, gradation, and application rates for standard and large glass beads and wet reflective beads/element used with modified urethane marking material must meet the modified urethane manufacturer's recommendation.

# APPENDIX





**CITY OF ANN ARBOR**  
**LIVING WAGE ORDINANCE DECLARATION OF COMPLIANCE**

The Ann Arbor Living Wage Ordinance (Section 1:811-1:821 of Chapter 23 of Title I of the Code) requires that an employer who is (a) a contractor providing services to or for the City for a value greater than \$10,000 for any twelve-month contract term, or (b) a recipient of federal, state, or local grant funding administered by the City for a value greater than \$10,000, or (c) a recipient of financial assistance awarded by the City for a value greater than \$10,000, shall pay its employees a prescribed minimum level of compensation (i.e., Living Wage) for the time those employees perform work on the contract or in connection with the grant or financial assistance. The Living Wage must be paid to these employees for the length of the contract/program.

*Companies employing fewer than 5 persons and non-profits employing fewer than 10 persons are exempt from compliance with the Living Wage Ordinance. If this exemption applies to your company/non-profit agency please check here  No. of employees\_\_*

The Contractor or Grantee agrees:

- (a) To pay each of its employees whose wage level is not required to comply with federal, state or local prevailing wage law, for work covered or funded by a contract with or grant from the City, no less than the Living Wage. The current Living Wage is defined as \$13.22/hour for those employers that provide employee health care (as defined in the Ordinance at Section 1:815 Sec. 1 (a)), or no less than \$14.75/hour for those employers that do not provide health care. The Contractor or Grantor understands that the Living Wage is adjusted and established annually on April 30 in accordance with the Ordinance and covered employers shall be required to pay the adjusted amount thereafter to be in compliance with Section 1:815(3).

**Check the applicable box below which applies to your workforce**

Employees who are assigned to any covered City contract/grant will be paid at or above the applicable living wage without health benefits

Employees who are assigned to any covered City contract/grant will be paid at or above the applicable living wage with health benefits

- (a) To post a notice approved by the City regarding the applicability of the Living Wage Ordinance in every work place or other location in which employees or other persons contracting for employment are working.
- (b) To provide to the City payroll records or other documentation within ten (10) business days from the receipt of a request by the City.
- (c) To permit access to work sites to City representatives for the purposes of monitoring compliance, and investigating complaints or non-compliance.
- (d) To take no action that would reduce the compensation, wages, fringe benefits, or leave available to any employee covered by the Living Wage Ordinance or any person contracted for employment and covered by the Living Wage Ordinance in order to pay the living wage required by the Living Wage Ordinance.

The undersigned states that he/she has the requisite authority to act on behalf of his/her employer in these matters and has offered to provide the services or agrees to accept financial assistance in accordance with the terms of the Living Wage Ordinance. The undersigned certifies that he/she has read and is familiar with the terms of the Living Wage Ordinance, obligates the Employer/Grantee to those terms and acknowledges that if his/her employer is found to be in violation of Ordinance it may be subject to civil penalties and termination of the awarded contract or grant of financial assistance.

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Street Address

\_\_\_\_\_  
Signature of Authorized Representative

\_\_\_\_\_  
Date

\_\_\_\_\_  
City, State, Zip

\_\_\_\_\_  
Print Name and Title

\_\_\_\_\_  
Phone/Email address



# CITY OF ANN ARBOR LIVING WAGE ORDINANCE

**RATE EFFECTIVE APRIL 30, 2018 - ENDING APRIL 29, 2019**

**\$13.22** per hour

If the employer provides health care benefits\*

**\$14.75** per hour

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

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

## **ENFORCEMENT**

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

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

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

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

**For Additional Information or to File a Complaint Contact:  
Colin Spencer at 734/794-6500 or [cspencer@a2gov.org](mailto: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 of interest policies as stated within the certification section below.

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

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

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

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

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



# CITY OF ANN ARBOR NON-DISCRIMINATION ORDINANCE

Relevant provisions of Chapter 112, Nondiscrimination, of the Ann Arbor City Code are included below.  
You can review the entire ordinance at [www.a2gov.org/humanrights](http://www.a2gov.org/humanrights).

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

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

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

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

**Complaint Procedure:** If any individual believes there has been a violation of this chapter, he/she may file a complaint with the City's Human Rights Commission. The complaint must be filed within 180 calendar days from the date of the individual's knowledge of the allegedly discriminatory action or 180 calendar days from the date when the individual should have known of the allegedly discriminatory action. A complaint that is not filed within this timeframe cannot be considered by the Human Rights Commission. To file a complaint, first complete the complaint form, which is available at [www.a2gov.org/humanrights](http://www.a2gov.org/humanrights). Then submit it to the Human Rights Commission by e-mail ([hrc@a2gov.org](mailto:hrc@a2gov.org)), by mail (Ann Arbor Human Rights Commission, PO Box 8647, Ann Arbor, MI 48107), or in person (City Clerk's Office). For further information, please call the commission at 734-794-6141 or e-mail the commission at [hrc@a2gov.org](mailto:hrc@a2gov.org).

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

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

## MICHIGAN DEPARTMENT OF TRANSPORTATION CERTIFIED PAYROLL

COMPLETION OF CERTIFIED PAYROLL FORM FULFILLS THE MINIMUM MDOT PREVAILING WAGE REQUIREMENTS

(1) NAME OF CONTRACTOR / SUBCONTRACTOR (CIRCLE ONE) (2) ADDRESS

(3) PAYROLL NO. (4) FOR WEEK ENDING (5) PROJECT AND LOCATION (6) CONTRACT ID

(a)	(b)	(c)	(d) DAY AND DATE							(e)	(f)	(g)	(h)	(i)	(j) DEDUCTIONS						(k)		
			HOURS WORKED ON PROJECT												TOTAL HOURS ON PROJECT	PROJECT RATE OF PAY	PROJECT RATE OF FRINGE PAY	GROSS PROJECT EARNED	GROSS WEEKLY EARNED	TOTAL WEEKLY HOURS WORKED ALL JOBS		FICA	FEDERAL
EMPLOYEE INFORMATION	WORK CLASSIFICATION	Hour Type								0			\$0.00									\$0.00	\$0.00
NAME:										0			\$0.00									\$0.00	\$0.00
ETH#GEN: ID #:	GROUP/CLASS #:	S								0			\$0.00									\$0.00	\$0.00
NAME:										0			\$0.00									\$0.00	\$0.00
ETH#GEN: ID #:	GROUP/CLASS #:	S								0			\$0.00									\$0.00	\$0.00
NAME:										0			\$0.00									\$0.00	\$0.00
ETH#GEN: ID #:	GROUP/CLASS #:	S								0			\$0.00									\$0.00	\$0.00
NAME:										0			\$0.00									\$0.00	\$0.00
ETH#GEN: ID #:	GROUP/CLASS #:	S								0			\$0.00									\$0.00	\$0.00
NAME:										0			\$0.00									\$0.00	\$0.00
ETH#GEN: ID #:	GROUP/CLASS #:	S								0			\$0.00									\$0.00	\$0.00
NAME:										0			\$0.00									\$0.00	\$0.00
ETH#GEN: ID #:	GROUP/CLASS #:	S								0			\$0.00									\$0.00	\$0.00
NAME:										0			\$0.00									\$0.00	\$0.00

Date \_\_\_\_\_

I, \_\_\_\_\_  
 (Name of Signatory Party) (Title)

do hereby state:

(1) That I pay or supervise the payment of the persons employed by

\_\_\_\_\_ on the  
 (Contractor or Subcontractor)  
 \_\_\_\_\_; that during the payroll period commencing on the  
 (Building or Work)

\_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, and ending the \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_,  
 all persons employed on said project have been paid the full weekly wages earned, that no rebates have  
 been or will be made either directly or indirectly to or on behalf of said

\_\_\_\_\_ from the full  
 (Contractor or Subcontractor)

weekly wages earned by any person and that no deductions have been made either directly or indirectly  
 from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part  
 3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948,  
 63 Stat. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. § 3145), and described below:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

(2) That any payrolls otherwise under this contract required to be submitted for the above period are  
 correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the  
 applicable wage rates contained in any wage determination incorporated into the contract; that the  
 classifications set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide  
 apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of  
 Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a  
 State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:

(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

— in addition to the basic hourly wage rates paid to each laborer or mechanic listed in  
 the above referenced payroll, payments of fringe benefits as listed in the contract  
 have been or will be made to appropriate programs for the benefit of such  
 employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

— Each laborer or mechanic listed in the above referenced payroll has been paid,  
 as indicated on the payroll, an amount not less than the sum of the applicable  
 basic hourly wage rate plus the amount of the required fringe benefits as listed  
 in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS:  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

NAME AND TITLE	SIGNATURE

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR  
 SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE  
 31 OF THE UNITED STATES CODE.



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
WATER RESOURCES DIVISION

**PERMIT APPLICATION FOR WASTEWATER SYSTEMS**

Construction - Alteration - Addition or Improvement as Described Herein  
Required under the Authority of Part 41, Sewerage Systems, of 1994 PA 451, as amended (Act 451)

This application becomes a Part 41 Construction Permit only when signed and issued by authorized DEQ staff.

**INSTRUCTIONS:** Complete items 1 through 32 on this form and complete the Project Basis of Design (attached form EQP-4600A) or provide same information. Print or type all information except for signatures. Complete the Streamlined Checklist (EQP5937) for sewer projects that qualify; checklist available at [www.michigan.gov/deq](http://www.michigan.gov/deq) (select Water; then select Wastewater Construction). Complete the Non-Governmental Ownership Checklist (attached form EQP-4600C) for non-governmentally owned projects. Deliver complete application, plans and specifications, and attachments to the DEQ district office having jurisdiction for the project.

**PROCESSING TIME FRAME:** Part 13, Permits, of Act 451 allows 150 days for processing of an administratively complete Part 41 permit application, with extensions available when requested by the applicant. However, permits are generally processed within 45 days or less for routine projects. For information regarding recent permit processing time frames, refer to the WRD Metrics Web page (refer to metric B-9). For a fee, an expedited permit review process is available for applicants seeking quicker review time frames; information about this process is available at [www.michigan.gov/deq](http://www.michigan.gov/deq) (select Water; then select Wastewater Construction) or click here.

**REQUIRED NOTIFICATIONS:** The permittee shall provide Startup Notification (just prior to excavation) including permit number and date of issuance and Completion Notification (upon completion of the project) including permit number and date of issuance to the DEQ district office having jurisdiction for the project (attached form EQP-4600B).

<b>PERMIT NUMBER (DEQ USE ONLY)</b> P41001863		<b>DATE OF ISSUANCE (DEQ USE ONLY)</b> January 11, 2019	
<b>1. Municipality or Organization Name and Address</b> that will own the wastewater facilities to be constructed. This permit is to be issued to: City of Ann Arbor 301 East Huron Street Ann Arbor, Michigan 48104			
<b>2. Owner's Contact Person</b> (provide name for questions) Contact: Michael Nearing Phone: 734-794-6410, Ext. 43635			
<b>3. Project Name</b> (Provide phase number if project is segmented) Southside Interceptor Sanitary Diversion Project			
<b>4. Project Location</b> Ann Arbor		County (location of project) Washtenaw County	

ISSUED UNDER THE AUTHORITY OF THE DIRECTOR OF THE DEPARTMENT OF ENVIRONMENTAL QUALITY

cc: Fishbeck, Thompson, Carr, and Huber Inc.  
Washtenaw County Health Department  
Washtenaw County Drain Commissioner

Issued by: Brent A. Bodnar  
Brent A. Bodnar, P.E., Environmental Engineer  
Lansing District Office, 517-243-8011

If this box is marked see special conditions attached to this permit.

**GENERAL PERMIT CONDITIONS**

- This PERMIT only authorizes the construction, alteration, addition, or improvement of the wastewater system as described herein and is issued solely under the authority of Part 41 of Act 451.
- Issuance of this PERMIT does not authorize any violation of federal, state, or local laws or regulations, nor does it obviate the need to obtain other permits or approvals from the DEQ or other units of government as may be required by law.
- This PERMIT expires two (2) years after the above date of issuance unless construction starts prior to the expiration date in accordance with R 299.2939(2) of the Part 41 Administrative Rules.
- Any portion of the herein described facilities constructed prior to the date of issuance is not authorized by this PERMIT and is a violation of Act 451.
- No sewer shall be placed into service unless and until the outlet sewer has been constructed, tested, and placed into service.
- Failure to meet any condition of this PERMIT or any requirement of Act 451 constitutes a violation of Act 451.
- The applicant must provide notice of impending construction to public utilities and comply with the requirements of the Protection of Underground Facilities Act, 1974 PA 53, as amended (MISS DIG).
- All earth changing activities must be conducted in accordance with Part 91, Soil Erosion and Sedimentation Control, of Act 451.
- All construction activity impacting wetlands shall be conducted in accordance with Part 303, Wetlands Protection, of Act 451.
- Intentionally providing false information in this application constitutes a violation of Section 249 of the Michigan Penal Code, 1931 PA 328, as amended.





6. **Facilities Description** In the space below, provide a detailed description of the proposed project in the format shown in the examples at the bottom of this page. Applications with inadequate facilities descriptions **will be returned**. Use additional sheets if needed.

CONSTRUCT A CAST-IN-PLACE CONCRETE 14'-0" LONG BY 14'-8" WIDE BY 12'-0" TALL SANITARY SEWER DIVERSION CHAMBER THAT WILL DIVERT APPROXIMATELY 11 CFS OF EXISTING SANITARY SEWER FLOW FROM THE EXISTING 42" DIAMETER SOUTHSIDE INTERCEPTOR SANITARY SEWER INTO THE EXISTING 72" NORTHSIDE INTERCEPTOR SANITARY SEWER DURING A 50-YEAR PEAK FLOW RECURRENCE INTERVAL WET-WEATHER EVENT.

THE PROJECT WILL ALSO CONSTRUCT APPROXIMATELY 56 LF OF 24" RCP SAN. SEWER @ 4.00% SLOPE; 16 LF OF 24" RCP @ 2.0% SLOPE; AND APPROXIMATELY 37 LF OF 42" RCP SAN. SEWER @ 2.0% SLOPE. THESE PIPES ARE BEING CONSTRUCTED AS SHOWN ON THE PLAN TO RE-ROUTE EXISTING SANITARY FLOWS TO THE OUTLET SEWER.

THIS PROPOSED CHAMBER IS A **REPLACEMENT** OF AN EXISTING DIVERSION STRUCTURE THAT CURRENTLY EXISTS NEAR THE SITE OF THE TO-BE CONSTRUCTED CHAMBER. THE EXISTING DIVERSION STRUCTURE CURRENTLY DIVERTS APPROXIMATELY 7.5 CFS OF FLOW INTO THE EXISTING NORTHSIDE INTERCEPTOR SANITARY SEWER.

THE DIVERSION CHAMBER HAS BEEN SIZED TO RETAIN APPROXIMATELY 10 CFS IN THE EXISTING 42" SOUTHSIDE INTERCEPTOR SEWER DURING THE DESIGN WET-WEATHER EVENT.

THIS PROJECT WILL GENERATE **NO NEW SANITARY SEWER FLOWS**; IT HAS BEEN DESIGNED TO ALLEVIATE OVERFLOWS THAT OCCUR, OR COULD OCCUR, DOWNSTREAM OF THIS LOCATION WITHIN THE EXISTING SOUTHSIDE INTERCEPTOR SANITARY SEWER DURING THE DESIGN WET-WEATHER EVENT.

ATTACHED, PLEASE FIND THE BASIS OF DESIGN REPORT DATED MARCH 29, 2018 PREPARED BY OHM ADVISORS, INC. THAT DEFINES THE TARGETED FLOW SPLIT BETWEEN THE TWO TRUNKLINE SANITARY SEWERS. ALSO ATTACHED, PLEASE FIND THE DESIGN CALCULATIONS PREPARED BY FISHBECK, THOMPSON, CARR, AND HUBER, INC. THAT DETERMINE THE FLOW TO BE DIVERTED FROM THE EXISTING SOUTHSIDE INTERCEPTOR SANITARY SEWER BY THE INSTALLATION OF THE PROPSED DIVERSION CHAMBER.

<b>EXAMPLES OF FACILITIES DESCRIPTIONS</b>	
Sanitary Sewers and/or Force Mains	250 feet of 10" sanitary sewer in Mark Avenue between John and Lincoln Streets. <b>OR</b> 250' of 10" sewer in an easement from the intersection of Mark Avenue and John Street to the north.
Pumping Stations	A wetwell/drywell, suction lift, submersible, etc. pumping station rated for 250 gpm at a TDH of 34' located at the northeast corner of Mark Avenue and Lincoln Street, and equipped with two pumps, backup power, pump around capability, and all other equipment as required for proper operation.
Wastewater Treatment Facilities	A 10 million gpd (avg. flow) facility located at the north end of Ronald Street including a 2.0 million gallon equalization basin, six 0.5 million gallon primary clarifiers, four 0.75 million gallon aeration basins with fine bubble aerators, four 0.8 million gallon circular secondary clarifiers, ultraviolet disinfection, and all necessary appurtenances and piping as shown on the plans and described in the specifications for the proper operation of the treatment facility to provide a discharge quality in compliance with the facility's discharge permit.





Michigan Department of Environmental Quality  
Water Resources Division  
Permit Application for Wastewater Systems (Continued)

**GENERAL PROJECT INFORMATION – Complete All Boxes Below**

<p>7. Design engineer's name, engineering firm, address, phone no., and e-mail address: Fishbeck, Thompson, Carr, and Huber, Inc. 1515 Arboretum Drive, S.E. Grand Rapids, Michigan 49546 <a href="mailto:jrplatte@ftch.com">jrplatte@ftch.com</a> (616) 575-3824</p>	<p>8. Indicate who will prepare "as-built" plans for this project: <input type="checkbox"/> Design Engineer in Box 7 <input checked="" type="checkbox"/> Other - name, organization, address, and phone no.: City of Ann Arbor Engineering 301 E. Huron Street Ann Arbor, Michigan 48104</p>
<p>9. Indicate who will provide project construction inspection: <input type="checkbox"/> Engineering firm listed in Box 7 <input checked="" type="checkbox"/> Other - name, organization, address, and phone no.: City of Ann Arbor 301 E. Huron Street Ann Arbor, Michigan 48104</p>	<p>10. Is groundwater dewatering expected for this project? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If YES, provide dewatering specifications. If YES, will water wells or water bodies be impacted? <input type="checkbox"/> YES <input type="checkbox"/> NO NOTE: If groundwater dewatering is expected, and especially if it may result in a large quantity withdrawal (greater than 70 gallons per minute), registration with the DEQ is required and a permit may be necessary. For more information, please contact the <u>Water Use Program staff</u>. If a Part 327 permit is required, it may cause delay in issuance of a Part 41 permit, and/or result in project design revisions.</p>
<p>11. To which wastewater collection system will the project connect? City of Ann Arbor Collection System</p>	<p>12. To which wastewater treatment system will the project connect? Ann Arbor Waste Water Treatment Plant Final discharge is to: <input type="checkbox"/> Groundwater <input checked="" type="checkbox"/> Surface Water</p>
<p>13. Will this project be within 50 ft. of a private water well? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If YES, locate on plans.</p>	<p>14. Will this project be within 200 ft. of a public water well? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If YES, locate on plans.</p>
<p>15. Is the project construction activity within a wetland (as defined by Section 30301(p) of Part 303 of Act 451)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If YES, has application been made for a wetland permit? <input type="checkbox"/> YES <input type="checkbox"/> NO</p>	<p>16. Is the project construction activity within a 100-year floodplain (as defined by Section 3101 of Part 31, Water Resources Protection, of Act 451, and the associated Administrative Rules)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If YES, has application been made for a floodplain permit? <input type="checkbox"/> YES <input type="checkbox"/> NO</p>
<p>17. Is the project construction activity below the ordinary high water mark of an inland lake or stream (as defined by Section 30101(f) of Part 301 of Act 451)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If YES, has application been made for an inland lakes and streams permit? <input type="checkbox"/> YES <input type="checkbox"/> NO</p>	<p>18. Is the project construction activity within 500 ft. of a lake, reservoir, or stream? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO If YES, has application been made for a Soil Erosion and Sedimentation Control Permit? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Is owner listed in box 2 of this application an Authorized Public Agency (Section 9110 of Part 91 of Act 451)? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p>
<p>19. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Please contact 517-284-5587 with questions regarding the storm water regulations. If YES, is project regulated by the National Pollutant Discharge Elimination System (NPDES) storm water regulations? <input type="checkbox"/> YES: Attach copy of application or NPDES authorization to discharge storm water from construction activities. <input type="checkbox"/> NO: Describe why activity is not regulated:</p>	
<p>20. Is the project in or adjacent to a site of known soil or groundwater contamination? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If YES, attach a copy of a plan acceptable to the DEQ for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DEQ office for listings of Michigan sites of environmental contamination.</p>	

**SEWER SYSTEM CAPACITY**

21. Are there any known capacity concerns in the collection system downstream of the proposed project? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO If YES, <b>include a full explanation with the application.</b>	Flow Rate	Units
22. Proposed project peak design flow rate:	N/A	cfs
23. Total capacity of the existing outlet sewer:	105	cfs
24. Current peak hour flow into the existing outlet sewer:	52	cfs
25. Design capacity of nearest downstream pumping station (largest pump out of service):	N.A. <input checked="" type="checkbox"/>	
26. Current peak hour flow into nearest downstream pump station:	N.A. <input checked="" type="checkbox"/>	



Michigan Department of Environmental Quality  
Water Resources Division  
Permit Application for Wastewater Systems (Continued)

**OVERFLOWS AND BASEMENT FLOODING – For Proposed Sewer Projects, Mark All Boxes That Apply**

27. Has the downstream collection system overflowed or flooded basements in the past five years?  YES  NO  
If YES, attach a listing of events in the past five years including date, location, cause, and corrective action.

28. Has the downstream collection system owner entered into an agreement satisfactory to the DEQ to address sanitary sewer overflows and flooding of basements?  YES  NO  
If YES, enter agreement name and number: \_\_\_\_\_

**29. TREATED WASTEWATER DISCHARGE AUTHORIZATION – Mark Boxes As Appropriate**

A. Does project include a new treatment facility or expansion, a change in discharge method, or a new discharge location?  
 YES – Complete B below  NO – skip to item 30

B. If A is marked YES, indicate discharge authorization and provide the requested information:  
1. NPDES or Groundwater Discharge Permit No: \_\_\_\_\_ Permit Authorized Flow Rate: \_\_\_\_\_ Units: \_\_\_\_\_  
2. Local health department approval. **Include a copy of the approval with this application.**

**30. OWNERSHIP – Mark A or B as Appropriate Below**

A. Ownership will be by a governmental entity before the sewer is placed in service.

B. Ownership will be by a non-governmental entity, and a **completed Non-Governmental Ownership Checklist is included with this application.**

**Note:** A completed **Non-Governmental Ownership Checklist** (EQP-4600C) must be included with the application for **non-governmentally owned projects**. The checklist is attached to this application and the supporting information is available at [www.michigan.gov/deq](http://www.michigan.gov/deq) (select Water; then select Wastewater Construction).

**31. COMPLETE APPLICATION CHECKLIST – Please confirm that this application is complete by using this checklist. Mark the box if the condition is met. This will help reduce DEQ review time and speed permit issuance.**

<input checked="" type="checkbox"/> A. Items 1 to 30 of the application are completed.	<input checked="" type="checkbox"/> E. Owner's certification signed and complete (item 32).
<input type="checkbox"/> B. A contamination management plan is included for sites with known contamination (item 20). <input checked="" type="checkbox"/> N.A.	<input checked="" type="checkbox"/> F. A detailed basis of design is included with the application. Form EQP-4600A (attached) or similar form is completed providing information required by Rule 35(3) of the Part 41 Administrative Rules of Act 451.
<input type="checkbox"/> C. For projects with local health department discharge authorization, a copy of the health department authorization is included (item 29). <input checked="" type="checkbox"/> N.A.	<input checked="" type="checkbox"/> G. Final plans and specifications sealed and signed by a Michigan licensed professional engineer are provided.
<input type="checkbox"/> D. For non-governmentally owned projects, provide the Non-Governmental Ownership Checklist and all documents required by the checklist (item 30). <input checked="" type="checkbox"/> N.A.	

**32. OWNER'S CERTIFICATION – The owner of the proposed facilities or the owner's authorized representative shall complete the following owner's certification:**

I, Michael Nearing (name), acting as the Senior Project Manager (title/position) for the City of Ann Arbor (entity owning proposed facilities) certify that the information provided in and with this application is true and accurate to the best of my knowledge, and I certify that the plans and specifications and other documents submitted to the DEQ with the Part 41 Permit Application accurately represent what I intend to construct under the terms of the Part 41 Permit, once issued. Also, I certify that this proposed project as detailed in the plans and specifications submitted under this application is in compliance with the requirement of Rule 41(a) of the Part 41 Administrative Rules of Act 451, which states that "Proper devices are or will be available and are in satisfactory operation for the collection, transportation and treatment before discharge into any public watercourse, lake, drain, ditch or groundwater, of the sewage or wastes collected or conveyed by such systems, or a definite program or agreement satisfactory to the department leading to the construction and operation of such collection, transportation or treatment devices shall have been officially adopted by the applicant for such permit and filed in the offices of the department." Further, I hereby acknowledge the requirement to provide Startup Notification (just prior to excavation) with the permit number and date of issuance and Completion Notification (upon completion of the project) with the permit number and date of issuance to the DEQ district office having jurisdiction for the project.

SIGNATURE: Michael G. Nearing, P.E. DATE: 12/20/18

NAME (TYPED): MICHAEL G. NEARING, P.E. PHONE: (734) 794-3410 EXT. 43635



## PROJECT BASIS OF DESIGN

PROJECT NAME: Southside Interceptor Sanitary Sewer Diversion Chamber Project

For this PROJECT the following information must be provided per Rule 35(3) of the Part 41 Administrative Rules of Act 451. Attach additional sheets as necessary.

- A. A general map of the initial and ultimate service areas  
Included on engineering plans      Attached separately
- B. The design service area in acres      Initial \_\_\_\_\_ Ultimate
- C. The design population densities per acre      Initial \_\_\_\_\_ Ultimate
- D. 1. The ultimate design population N/A or total Residential Equivalent Units (REU) N/A  
2. The design per capita sewage contribution N/A (gpd) or design contribution per REU N/A (gpd)
- E. The design commercial and industrial flow      Initial  
  
Ultimate
- Mark this box if any commercial or industrial user(s) served by this project are subject to the federal categorical pretreatment standards or may discharge substances with the potential to interfere with the operation of the wastewater collection and/or treatment system.
- F. Wastewater flow rates for proposed project
1. Initial design average flow      0      Units \_\_\_\_\_
2. Initial design peak flow      0      Units \_\_\_\_\_
3. Ultimate design average flow      0      Units cfs
4. Ultimate design maximum flow (peak hour)      0      Units cfs
- G. An analysis, including calculations and/or flow monitoring, of the effect of the proposed additional flows on the receiving collection system. This project has been contemplated by the City of Ann Arbor to alleviate excess wet-weather sanitary sewer flows in the existing Southside Interceptor Sanitary Sewer. Please see the attached basis of design prepared by OHM-Advisors, Inc. and the calculations prepared by Fishbeck, Thompson, Carr, and Huber, Inc. that detail the need and amount of the needed sanitary flow split and the calculations that define the flow split itself. This project will **not** create any new sanitary sewer flows, but better proportion them amongst the trunkline sanitary sewers leading to the City's waste water treatment plant.
- H. For proposed pump stations and treatment facilities, attach a detailed explanation of steps to be taken in case of power failure or equipment breakdown, including a description of special reserve units available for emergency treatment, storage, and/or transportation of the wastewater. N/A

