

CITY OF ANN ARBOR
INVITATION TO BID



North Fifth Avenue Reconstruction

ITB No. 4519

Due Date: Thursday, January 11, 2018, 10:00am (Local Time)

Public Services/Engineering Department

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*

NOTICE OF PRE-BID CONFERENCE

A pre-bid conference for this project will be held on **Friday, December 15, 2017 at 10:00am** at **Larcom City Hall, 301 E. Huron Street, in the South Conference Room on the 1st Floor.**

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

INSTRUCTIONS TO BIDDERS

General

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

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

Preparation of Bids

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

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

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

Questions or Clarification on ITB Specifications

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

All questions shall be due on or before **Thursday, December 28, 2017 at 5:00pm** and should be addressed as follows:

Specification/Scope of Work questions emailed to jnelson@a2gov.org
Bid Process and Compliance questions emailed to cspencer@a2gov.org

Any error, omissions or discrepancies in the specification discovered by a prospective contractor and/or service provider shall be brought to the attention of **Jennifer Nelson** at jnelson@a2gov.org after discovery as possible. Further, the contractor and/or service provide shall not be allowed to take advantage of errors, omissions or discrepancies in the specifications.

Addenda

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

Each Bidder must in its Bid, to avoid any miscommunications, acknowledge all addenda which it

has received, but the failure of a Bidder to receive, or acknowledge receipt of; any addenda shall not relieve the Bidder of the responsibility for complying with the terms thereof.

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

Bid Submission

All Bids are due and must be delivered to the City of Ann Arbor Procurement Unit on or before **Thursday, January 11, 2018, 10:00am EST**. Bids submitted late or via oral, telephonic, telegraphic, electronic mail or facsimile **will not** be considered or accepted.

Each Bidder must submit one (1) original Bid and **two (2)** Bid copies in a sealed envelope clearly marked: **ITB No. 4519 - North Fifth Avenue Reconstruction**.

Bids must be addressed and delivered to:

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

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

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

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

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

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

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

Award

The City intends to award a Contract(s) to the lowest responsible Bidder(s). On multi-divisional contracts, separate divisions may be awarded to separate Bidders. The City may also utilize alternatives offered in the Bid Forms, if any, to determine the lowest responsible Bidder on each division, and award multiple divisions to a single Bidder, so that the lowest total cost is achieved

for the City. For unit price bids, the Contract will be awarded based upon the unit prices and the lump sum prices stated by the bidder for the work items specified in the bid documents, with consideration given to any alternates selected by the City. If the City determines that the unit price for any item is materially different for the work item bid than either other bidders or the general market, the City, in its sole discretion, in addition to any other right it may have, may reject the bid as not responsible or non-conforming.

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

Official Documents

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

Bid Security

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

Withdrawal of Bids

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

Contract Time

Time is of the essence in the performance of the work under this Contract. The available time for work under this Contract is indicated on page C-2, Article III of the Contract. If these time requirements can not be met, the Bidder must stipulate on Bid Form Section 3 - Time Alternate its schedule for performance of the work. Consideration will be given to time in evaluating bids.

Liquidated Damages

A liquidated damages clause, as given on page C-1 Article III of the Contract, provides that the Contractor shall pay the City as liquidated damages, and not as a penalty, a sum certain per day for each and every day that the Contractor may be in default of completion of the specified work, within the time(s) stated in the Contract, or written extensions.

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

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

to preclude recovery of actual damages in addition to the recovery of liquidated damages.

Human Rights Information

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

Wage Requirements

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

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

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

For the purposes of this ITB the Construction Type of 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.

Cost Liability

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

Reservation of Rights

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

Idlefree Ordinance

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

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

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

In addition, generators and other internal combustion engines are covered

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

INVITATION TO BID

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

Ladies and Gentlemen:

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

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

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

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

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

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

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

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

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

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

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

SIGNED THIS _____ DAY OF _____, 201__.

Bidder's Name

Authorized Signature of Bidder

Official Address

(Print Name of Signer Above)

Telephone Number

Email Address for Award Notice

LEGAL STATUS OF BIDDER

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

Bidder declares that it is:

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

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

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

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

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

Authorized Official

_____ **Date** _____, 201__

(Print) Name _____ Title _____

Company: _____

Address: _____

Contact Phone () _____ Fax () _____

Email _____

BID FORM
Section 1 - Schedule of Prices
Project ITB - 4519 - North Fifth Avenue Reconstruction

Item Number	Description	Unit	Quantity	Unit Price	Total Cost
101	General Conditions, Max \$200,000	LS	1	\$ _____ = \$ _____	
102	Audiovisual Tape Coverage	LS	1	\$ _____ = \$ _____	
104	Certified Payroll Compliance and Reporting	LS	1	\$ _____ = \$ _____	
120	Project Supervision, Max \$100,000	LS	1	\$ _____ = \$ _____	
135	Tree Removal (8" and Larger)	Ea	25	\$ _____ = \$ _____	
140	Exploratory Excavation (0-10' deep)	Lft	400	\$ _____ = \$ _____	
203	Minor Traf Devices	LS	1	\$ _____ = \$ _____	
204	Non-hazardous Contaminated Material Handling and Disposal	Cyd	550	\$ _____ = \$ _____	
205	Machine Grading, Modified,	Sta	27	\$ _____ = \$ _____	
207	Plaza Amenities, Rem and Salvage	LS	1	\$ _____ = \$ _____	
208	Geotextile	Syd	450	\$ _____ = \$ _____	
209	Geogrid	Syd	200	\$ _____ = \$ _____	
210	Stone Reservoir	Cyd	250	\$ _____ = \$ _____	
215	Infiltration Inlet	Ea	4	\$ _____ = \$ _____	
220	HMA Base Course	Ton	450	\$ _____ = \$ _____	
221	HMA Leveling	Ton	360	\$ _____ = \$ _____	
222	HMA Wearing	Ton	315	\$ _____ = \$ _____	
223	Temporary Pavement/Pedestrian Access	Syd	1,200	\$ _____ = \$ _____	
226	Recessing Pavt Mrkg, Transv	Sft	2,110	\$ _____ = \$ _____	
227	Remove Concrete Sidewalk and Driveways - Any Thickness	Syd	2,529	\$ _____ = \$ _____	
228	Road Pavement, Rem	Syd	4,347	\$ _____ = \$ _____	

Total This Page \$ _____

BID FORM
Section 1 - Schedule of Prices
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Item Number	Description	Unit	Quantity	Unit Price	Total Cost
230	Remove Concrete Curb or Curb & Gutter - Any Type	Lft	2,160	\$ _____ = \$ _____	_____
231	Concrete Curb, 6 inch Straight	Lft	795	\$ _____ = \$ _____	_____
232	Concrete Planter Curb	Lft	409	\$ _____ = \$ _____	_____
233	Salvage and Reset Stone Curb	Lft	60	\$ _____ = \$ _____	_____
234	Concrete Curb & Gutter - Any Type	Lft	2,162	\$ _____ = \$ _____	_____
235	8 inch Concrete Ramp	Sft	2,366	\$ _____ = \$ _____	_____
236	6-Inch Concrete Sidewalk	Sft	20,574	\$ _____ = \$ _____	_____
237	8-Inch Concrete Drive Approach (TYPE L or M)	Sft	5,595	\$ _____ = \$ _____	_____
238	Concrete Pavement Base, 8 inch (under pavers)	Sft	14,851	\$ _____ = \$ _____	_____
239	Concrete Crosswalk, 12 inch	Sft	3,764	\$ _____ = \$ _____	_____
240	Detectable Warning Surface	Sft	322	\$ _____ = \$ _____	_____
241	Brick Pavers, New	Sft	11,881	\$ _____ = \$ _____	_____
242	Brick, Install Salvaged Brick	Sft	2,970	\$ _____ = \$ _____	_____
245	Concrete Seat Wall	Lft	179	\$ _____ = \$ _____	_____
246	Concrete Unit Retaining Wall, Rem, Salvage, and Re-install	Lft	30	\$ _____ = \$ _____	_____
249	Hydrant Assembly Abandonment	Ea	3	\$ _____ = \$ _____	_____
250	Drain Pipe, 6 Inch	Lft	60	\$ _____ = \$ _____	_____
251	Landscape Inlet	Ea	2	\$ _____ = \$ _____	_____
252	Sewer Bulkhead, 4-inch Through 18-inch diameter	Ea	4	\$ _____ = \$ _____	_____
255	Temporary 6 Inch Water Main Line Stop	Ea	2	\$ _____ = \$ _____	_____
256	Temporary 8 Inch Water Main Line Stop	Ea	2	\$ _____ = \$ _____	_____

Total This Page \$ _____

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Section 1 - Schedule of Prices
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Item Number	Description	Unit	Quantity	Unit Price	Total Cost
257	Temporary 12 Inch Water Main Line Stop	Ea	2	\$ _____ = \$ _____	_____
260	Sand Subbase Course, Class II - C.I.P.	Cyd	350	\$ _____ = \$ _____	_____
261	Planting Soil	Cyd	150	\$ _____ = \$ _____	_____
262	Composite Planting Mix	Cyd	20	\$ _____ = \$ _____	_____
263	Riprap, Fieldstone	Cyd	2	\$ _____ = \$ _____	_____
264	Landscape Maintenance	Month	14	\$ _____ = \$ _____	_____
266	Tree Grate, 3 ft. X 5 ft.	Ea	4	\$ _____ = \$ _____	_____
267	Tree Grate, 3 ft. X 10 ft.	Ea	32	\$ _____ = \$ _____	_____
270	No Parking Sign	Ea	20	\$ _____ = \$ _____	_____
271	Sign, Portable Changeable Message	Ea	1	\$ _____ = \$ _____	_____
272	Channelizing Device, 42 Inch	Ea	80	\$ _____ = \$ _____	_____
273	Barricade Type III - Lighted	Ea	40	\$ _____ = \$ _____	_____
275	Temporary Sign - Type B	Ea	80	\$ _____ = \$ _____	_____
276	Temporary Sign - Type A	Ea	10	\$ _____ = \$ _____	_____
278	Lighted Arrow, Type C, Furnish & Operate	Ea	2	\$ _____ = \$ _____	_____
279	Temporary Pedestrian Type II Barricade	Ea	20	\$ _____ = \$ _____	_____
280	Temporary Pedestrian Type II Channelizer	Ea	1,200	\$ _____ = \$ _____	_____
281	Urban Bench	Ea	8	\$ _____ = \$ _____	_____
282	Urban Table and Benches	Ea	9	\$ _____ = \$ _____	_____
283	Bike Hoops, Surface Mount	Ea	6	\$ _____ = \$ _____	_____
284	Reinstall Plaza Amenities	LS	1	\$ _____ = \$ _____	_____

Total This Page \$ _____

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Item Number	Description	Unit	Quantity	Unit Price	Total Cost
285	Remove Parking Meter	Ea	25	\$ _____ = \$ _____	
286	Install Parking Meter	Ea	24	\$ _____ = \$ _____	
287	2" Schedule 80 PVC Electrical Conduit	Lft	1,296	\$ _____ = \$ _____	
288	3" Schedule 80 PVC Electrical Conduit	Lft	6,631	\$ _____ = \$ _____	
289	4" Schedule 80 PVC Electrical Conduit	Lft	648	\$ _____ = \$ _____	
290	Street Light, Rem	Ea	28	\$ _____ = \$ _____	
291	Special Trench Detail	Lft	215	\$ _____ = \$ _____	
292	Luminaire Installation	Ea	51	\$ _____ = \$ _____	
293	Pole Installation	Ea	39	\$ _____ = \$ _____	
295	Special Plaza Lighting	LS	1	\$ _____ = \$ _____	
296.10	Electrical Wiring - 10 Gauge	Lft	4800	\$ _____ = \$ _____	
296.8	Electrical Wiring - 8 Gauge	Lft	4000	\$ _____ = \$ _____	
297	Handhole Assembly, 12 inch x 18 inch	Ea	46	\$ _____ = \$ _____	
298	Handhole Assembly, 17 inch x 30 inch	Ea	14	\$ _____ = \$ _____	
305	SDR 35 PVC Pipe, 8 inch, Tr Det VII	Lft	18	\$ _____ = \$ _____	
305	SDR 35 PVC Sanitary Service Pipe, (4-8 inch, Tr Det I)	Lft	160	\$ _____ = \$ _____	
320	RCP, 12 inch, CI E, Tr Det I	Lft	505	\$ _____ = \$ _____	
321	RCP, 15 inch, CI E, Tr Det I	Lft	240	\$ _____ = \$ _____	
322	12 inch Infiltration Pipe	Lft	145	\$ _____ = \$ _____	
360	Type 1 Manholes	Ea	2	\$ _____ = \$ _____	
367	Single Inlet, 4 ft. dia.	Ea	14	\$ _____ = \$ _____	

Total This Page \$ _____

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Item Number	Description	Unit	Quantity	Unit Price	Total Cost
368	Single Inlet, 5 ft. dia.	Ea	1	\$ _____ = \$ _____	
369	Single Inlet, 6 ft. dia.	Ea	1	\$ _____ = \$ _____	
385	Sewer Pipe Abandonment	Lft	730	\$ _____ = \$ _____	
386	Sewer Structure Abandonment	Ea	10	\$ _____ = \$ _____	
392	Pipe Undercut & Refill	Cyd	70	\$ _____ = \$ _____	
481	Water Main Pipe Abandonment	Lft	1,970	\$ _____ = \$ _____	
482	Gate Valve-in-Box, Remove or Abandon	Ea	3	\$ _____ = \$ _____	
483	Gate Valve-in-Well, Remove or Abandon	Ea	3	\$ _____ = \$ _____	
510	Cold Milling Bituminous Pavement	Syd	450	\$ _____ = \$ _____	
516	6" Wrapped Edge Drain	Lft	2,100	\$ _____ = \$ _____	
522	Subgrade Undercutting, Type II	Cyd	200	\$ _____ = \$ _____	
527	Aggregate Base Course - 21AA - C.I.P.	Syd	6,000	\$ _____ = \$ _____	
563	Structure Covers	lbs	1,600	\$ _____ = \$ _____	
564	Reconstruct Structure	Ea	2	\$ _____ = \$ _____	
566	Adjust Structure Cover	Ea	16	\$ _____ = \$ _____	
567	Adjust Monument Box or Gate Valve Box	Ea	4	\$ _____ = \$ _____	
582	Temporary Pavement Marking (Type R)-In Place	Lft	500	\$ _____ = \$ _____	
702	Inlet Filter	Ea	40	\$ _____ = \$ _____	
703	Silt Fence	Lft	1,200	\$ _____ = \$ _____	
810	Acer Griseum	Ea	10	\$ _____ = \$ _____	
811	Amelanchier Canadensis 'Autumn Brilliance'	Ea	5	\$ _____ = \$ _____	

Total This Page \$ _____

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Item Number	Description	Unit	Quantity	Unit Price	Total Cost
812	Cercis canadensis	Ea	3	\$ _____ = \$ _____	_____
813	Celtis Occidentalis	Ea	2	\$ _____ = \$ _____	_____
814	Quercus Macrocarpa	Ea	2	\$ _____ = \$ _____	_____
815	Syringa reticula 'Ivory Silk'	Ea	10	\$ _____ = \$ _____	_____
816	Ulmus Japonica 'Discovery'	Ea	14	\$ _____ = \$ _____	_____
817	Ulmus x. 'Prospector'	Ea	8	\$ _____ = \$ _____	_____
818	Arctostaphylos uva-ursi	Ea	61	\$ _____ = \$ _____	_____
819	Hemerocallis 'Stella d'Oro'	Ea	169	\$ _____ = \$ _____	_____
820	Iris siberica 'Baby Sister'	Ea	73	\$ _____ = \$ _____	_____
821	Liriope Muscari 'Variegata'	Ea	416	\$ _____ = \$ _____	_____
822	Narciuss x' Dutch Master'	Ea	455	\$ _____ = \$ _____	_____
823	Sesleria Autumnalis	Ea	304	\$ _____ = \$ _____	_____
824	Carex Vulpinoidea	Ea	49	\$ _____ = \$ _____	_____
825	Panicum Virgatum 'Shenandoah'	Ea	175	\$ _____ = \$ _____	_____
826	Pachysandra Terminalis	Ea	213	\$ _____ = \$ _____	_____
901	Class 50 DIP w/Polyethylene Wrap, 12 inch, Tr Det I	Lft	1,560	\$ _____ = \$ _____	_____
902	Class 50 DIP w/Polyethylene Wrap, 8 inch, Tr Det I	Lft	50	\$ _____ = \$ _____	_____
903	Class 50 DIP w/Polyethylene Wrap, 6 inch, Tr Det I	Lft	115	\$ _____ = \$ _____	_____
904	Bends and Reducers, 12 inch	Ea	40	\$ _____ = \$ _____	_____
905	Bends and Reducers, 8 inch	Ea	10	\$ _____ = \$ _____	_____
906	Bends and Reducers, 6 inch	Ea	10	\$ _____ = \$ _____	_____

Total This Page \$ _____

BID FORM
Section 1 - Schedule of Prices
Project ITB - 4519 - North Fifth Avenue Reconstruction

Item Number	Description	Unit	Quantity	Unit Price	Total Cost
907	Tees & Crosses	Ea	13	\$ _____ = \$ _____	
908	Gate Valve-in-Well, 12 inch	Ea	11	\$ _____ = \$ _____	
910	Fire Hydrant Assembly	Ea	4	\$ _____ = \$ _____	
915	Excavate and Backfill Water Service Trench Tap and Lead	Lft	140	\$ _____ = \$ _____	
920	Pavt Mrkg, Wet Retrflec Polyurea, 4 inch, White	LFt	1,000	\$ _____ = \$ _____	
921	Pavt Mrkg, Wet Retrflec Polyurea, 6 inch, White	LFt	810	\$ _____ = \$ _____	
922	Pavt Mrkg, Wet Retrflec Polyurea, 4 inch, Yellow	LFt	300	\$ _____ = \$ _____	
923	Pavt Mrkg, Wet Retrflec Thermopl, 12 inch, Crosswalk	LFt	1,850	\$ _____ = \$ _____	
924	Pavt Mrkg, Wet Retrflec Thermopl, 12 inch, Cross Hatching, White	Lft	40	\$ _____ = \$ _____	
925	Pavt Mrkg, Wet Retrflec Thermopl, 24 inch, Stop Bar	LFt	210	\$ _____ = \$ _____	
926	Pavt Mrkg, Wet Retrflec Thermopl, Symbol	LFt	5	\$ _____ = \$ _____	
927	Pavt Mtkg, Type R, 4 inch, Black	LFt	200	\$ _____ = \$ _____	
229-1	Brick Pavers, Rem, Sort and Salvage, Roadway	Syd	2,168	\$ _____ = \$ _____	
229-2	Brick Pavers, Rem, Sort and Salvage, Sidewalk	Syd	343	\$ _____ = \$ _____	
630-1	Street Light Foundation, Type 1	Ea	39	\$ _____ = \$ _____	
630-2	Street Light Foundation, Type 2	Ea	10	\$ _____ = \$ _____	

Total This Page \$ _____

BID FORM
Section 1 - Schedule of Prices
Project ITB - 4519 - North Fifth Avenue Reconstruction

Total From BF-1 \$ _____

Total From BF-2 \$ _____

Total From BF-3 \$ _____

Total From BF-4 \$ _____

Total From BF-5 \$ _____

Total From BF-6 \$ _____

Total From BF-7 \$ _____

Total Base Bid \$ _____

Contractor: _____

BID FORM

Section 2 - Material and Equipment Alternates

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

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

<u>Item Number</u>	<u>Description</u>	<u>Add/Deduct Amount</u>
--------------------	--------------------	--------------------------

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 _____

BID FORM

Section 5 – References

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

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

1) _____
Project Name Cost Date Constructed

Contact Name Phone Number

2) _____
Project Name Cost Date Constructed

Contact Name Phone Number

3) _____
Project Name Cost Date Constructed

Contact Name Phone Number

SAMPLE STANDARD CONTRACT

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

CONTRACT

THIS AGREEMENT is made on the _____ day of _____, 201_, between the CITY OF ANN ARBOR, a Michigan Municipal Corporation, 301 East Huron Street, Ann Arbor, Michigan 48104 ("City") and _____ ("Contractor")

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

(Address)

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

ARTICLE I - Scope of Work

The Contractor agrees to furnish all of the materials, equipment and labor necessary; and to abide by all the duties and responsibilities applicable to it for the project titled [Insert Title of Bid and Bid Number] 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/Engineering**

Project means **North Fifth Avenue Reconstruction**

ARTICLE III - Time of Completion

- (A) The work to be completed under this Contract shall begin immediately on the date specified in the Notice to Proceed issued by the City.
- (B) The entire work for this Contract shall be completed within two hundred and thirty four (234) consecutive calendar days.
- (C) Failure to complete all the work within the time specified above, including any extension granted in writing by the Supervising Professional, shall obligate the Contractor to pay the City, as liquidated damages and not as a penalty, an amount

equal to \$1,000 for each calendar day of delay in the completion of all the work. If any liquidated damages are unpaid by the Contractor, the City shall be entitled to deduct these unpaid liquidated damages from the monies due the Contractor.

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

ARTICLE IV - The Contract Sum

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

_____ Dollars (\$_____)

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

ARTICLE V - Assignment

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

ARTICLE VI - Choice of Law

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

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

ARTICLE VII - Relationship of the Parties

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

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

compensation awarded for services under this agreement.

ARTICLE VIII - Notice

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

ARTICLE IX - Indemnification

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

ARTICLE X - Entire Agreement

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

FOR CONTRACTOR

By _____

Its: _____

FOR THE CITY OF ANN ARBOR

By _____
Christopher Taylor, Mayor

[signatures continue on next page]

By _____
Jacqueline Beaudry, City Clerk

Approved as to substance

By _____

City Administrator

By _____

Services Area Administrator

Approved as to form and content

Stephen K. Postema, City Attorney

PERFORMANCE BOND

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

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

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

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

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

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

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

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

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

(Name of Surety Company)

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 _____, 201_, for _____; and this bond is given for that Contract in compliance with Act No. 213 of the Michigan Public Acts of 1963 as amended;
- (3) If the Principal fails to promptly and fully repay claimants for labor and material reasonably required under the Contract, the Surety shall pay those claimants.
- (4) Surety's obligations shall not exceed the amount stated in paragraph 1, and Surety shall have no obligation if the Principal promptly and fully pays the claimants.

SIGNED AND SEALED this _____ day of _____, 201_

(Name of Surety Company)

By _____
(Signature)

Its _____
(Title of Office)

Approved as to form:

Stephen K. Postema, City Attorney

(Name of Principal)

By _____
(Signature)

Its _____
(Title of Office)

Name and address of agent:

GENERAL CONDITIONS

Section 1 - Execution, Correlation and Intent of Documents

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

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

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

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

Section 2 - Order of Completion

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

Section 3 - Familiarity with Work

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

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

Section 4 - Wage Requirements

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

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

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

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

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

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

Section 5 - Non-Discrimination

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

Section 6 - Materials, Appliances, Employees

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

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

Adequate sanitary facilities shall be provided by the Contractor.

Section 7 - Qualifications for Employment

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

Section 8 - Royalties and Patents

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

Section 9 - Permits and Regulations

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

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

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

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

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

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

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

Section 11 - Inspection of Work

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

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

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

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

Section 12 - Superintendence

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

Section 13 - Changes in the Work

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

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

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

Section 14 - Extension of Time

Extension of time stipulated in the Contract for completion of the work will be made if and as the

Supervising Professional may deem proper under any of the following circumstances:

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

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

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

Section 15 - Claims for Extra Cost

If the Contractor claims that any instructions by drawings or other media issued after the date of the Contract involved extra cost under this Contract, it shall give the Supervising Professional written notice within 7 days after the receipt of the instructions, and in any event before proceeding to execute the work, except in emergency endangering life or property. The procedure shall then be as provided for Changes in the Work-Section 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. All work under this Contract which is not included in these Standard Specifications, or which is performed using modifications to these Standard Specifications, shall be performed in accordance with the Detailed Specifications included in these contract documents.

Standard Specifications are available online:

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

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

NOTE: This project is being completed under a cooperative arrangement between the Ann Arbor Downtown Development Authority (DDA) and the City of Ann Arbor (City). The contract holder will be the City of Ann Arbor. References to either entity, whether mentioned singularly or together, shall be considered to include both entities in their role as co-sponsors of the project. Under this arrangement, both the City and the DDA have assigned project engineers to manage the project; therefore, references in these construction documents to “Engineer” shall be assumed to mean both engineer managers.

The Contractor is reminded as to the requirements of article 104.07 of the 2012 edition of the MDOT Standard Specifications, “Cooperation by the Contractor.”

The Contractor shall directly coordinate his/her work with the DDA and the City of Ann Arbor.

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

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

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

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

On all projects:

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

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

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

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

**DETAILED SPECIFICATION
FOR
DISPOSING OF EXCAVATED MATERIAL**

The Contractor shall dispose of, at the Contractor's expense, all excavated material. Costs for this work will not be paid for separately, but shall be included in the bid price of the Contract Item "General Conditions."

**DETAILED SPECIFICATION
FOR
INSURANCE REQUIREMENTS**

In addition to the insurance requirements noted in Section 28 of the General Conditions, the following agencies must be listed as additional insured:

“Ann Arbor Downtown Development Authority”

**DETAILED SPECIFICATION
FOR
PROTECTION OF UTILITIES**

Damages to utilities by the Contractor's operations shall be repaired by the utility owner at the Contractor's expense.

Delays to the work due to utility repairs are the sole responsibility of the Contractor.

The Contractor shall keep construction debris out of utilities at all times. The Contractor shall be back charged an amount of \$50.00 per day for each manhole/inlet/utility pipe that contains construction debris caused as a result of the Contractor's (including subcontractors and suppliers) work.

The Contractor is solely responsible for any damages to the utilities or abutting properties due to construction debris.

Certain sanitary and storm sewers within the influence of construction may have been cleaned and videotaped prior to construction. The City may also choose to videotape utility line(s) during or after the work of this Contract to inspect them for damages and/or construction debris. If such inspection shows damage and/or debris, then all costs of such inspection, cleaning, repairs, etc, shall be the Contractor's sole responsibility. If such inspection is negative, the City will be responsible for the costs of such inspection.

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

**DETAILED SPECIFICATION
FOR
SOIL EROSION CONTROL**

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

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

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

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

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

**DETAILED SPECIFICATION
FOR
SITE CLEAN-UP**

Immediately after completion of construction on each block, the Contractor shall clean the entire area within the influence of construction, including but not limited to all pavement, sidewalks, lawn areas, and underground utility structures, of all materials which may have accumulated prior to or during the construction.

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

**DETAILED SPECIFICATION
FOR
MATERIALS AND SUPPLIES CERTIFICATIONS**

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

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

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

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

**DETAILED SPECIFICATION
FOR
CONTRACT DRAWINGS/PLANS**

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

**DETAILED SPECIFICATION
FOR EXISTING
SOIL BORING AND PAVEMENT SECTION DATA**

Data pertaining to existing soil borings and pavement sections which may be included in these Contract Documents are provided to help the Engineer and Contractor determine the soil conditions existing within the construction area. The City in no way guarantees existing conditions to be the same as shown in the data. The Contractor is solely responsible for any and all conclusions he/she may draw from the data.

**DETAILED SPECIFICATION
FOR
WORKING IN THE RAIN**

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

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

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

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

**DETAILED SPECIFICATION
FOR
WORKING IN THE DARK**

The Contractor shall not work in the dark except as approved by the Engineer and only when lighting for night work is provided as detailed elsewhere in this contract.

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

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

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

**DETAILED SPECIFICATION
FOR
QUANTITIES AND UNIT PRICES**

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

**DETAILED SPECIFICATION
FOR
GENERAL CONSTRUCTION NOTES**

The following notes pertain to all Plan sheets issued as part of this Contract, and these notes shall be considered part of each Plan sheet or Detailed Information Sheet.

1. All work shall conform to latest revision of the City Standard Specifications.
2. The Contractor shall maintain access to all drives throughout the course of construction. Drives shall never be closed during non-working hours, unless otherwise authorized in writing by the Engineer.
3. The Contractor shall completely restore all existing site features to better than, or equal to, their existing condition.
4. The Contractor shall be aware that there are above-ground and below-ground utilities existing in and on these streets which include, but are not limited to: gas mains and service leads; water mains and service leads; storm sewer mains and service leads; sanitary sewer mains and service leads; telephone poles, wires, cables and conduits; electrical poles, wires, cables and conduits; cable television wires, cables and conduits, and other various utilities. The Contractor shall conduct all of its work so as not to damage or alter in any way, any existing utility, except where specified on the Plans or where directed by the Engineer. The City has videotaped and cleaned all sanitary and storm sewers, including storm sewer inlet leads, and has found all of these facilities to be in good condition, with the exception of those shown on the Plans for repairs or replacement.
5. The Contractor is solely responsible for any delays, damages, costs and/or charges incurred due to and/or by reason of any utility, structure, feature and/or site condition, whether shown on the Plans or not, and the Contractor shall repair and/or replace, at its sole expense, to as good or better condition, any and all utilities, structures, features and/or site conditions which are impacted by reason of the work, or damaged by its operations, or damaged during the operations of its subcontractors or suppliers.
6. No extra payments or adjustments to unit prices will be made for damages, delays, costs and/or charges due to existing utilities, structures, features and/or site conditions not shown or being incorrectly shown or represented on the Plans.
7. The Contractor is solely responsible for furnishing the appropriate equipment and qualified personnel for the size and condition of the site and the requirements of the proposed work. Damage to buildings, amenities, utilities, paving, and facilities within and adjacent to the work area, and to work already performed by the Contractor shall be the responsibility of the Contractor to repair as needed, at no cost to the project.

**DETAILED SPECIFICATION
FOR
CONCRETE DURABILITY**

DESCRIPTION

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

MATERIALS

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

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

* Fine and coarse aggregates shall consist of natural aggregates as defined in the 2012 MDOT Standard Specifications Section 902.02.A.1.

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

Alkali-Silica Reactivity

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

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

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

Method 1. Substitution of a portion of the cement with Class F Fly Ash, Slag Cement Grade 100 or

120 or a ternary mix (blended cement) containing a blend of Portland cement and slag cement, or Class F fly ash, or silica fume.

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

The maximum substitution of cement with the Slag Cement permitted shall be 40% by weight of total cementitious material (cement plus Slag Cement). The minimum replacement rate with Slag Cement shall be 25%.

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

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

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

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

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

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

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

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

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

Air Entrainment

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

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

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

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

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

CONSTRUCTION METHODS

Aggregate Control

Gradation control – The supplier shall provide a detailed stockpile management plan, describing

their process control procedure for shipping, handling, and stockpiling of each aggregate including workforce training.

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

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

Mixing

Central mix plants - The total volume of the batch shall not exceed the designated size of the mixer or the rated capacity as shown on the manufacturer's rating plate.

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

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

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

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

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

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

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

Curing

Apply liquid curing compound in a fine atomized spray to form a continuous, uniform film on the horizontal surface, vertical edges, curbs and back of curbs immediately after the surface moisture has disappeared, but no later than 30 minutes after concrete placement. With approval of the Engineer, the timing of cure application may be adjusted due to varying weather conditions and concrete mix properties.

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

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

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

COMPLIANCE WITH STANDARDS

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

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

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

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

expenses. Time extensions will not be granted to the Contractor for any required repair work to meet the requirements of this specification.

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

MEASUREMENT AND PAYMENT

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

**DETAILED SPECIFICATION
FOR
PROGRESS CLAUSE**

PROGRESS CLAUSE: Contract Award is expected on February 20, 2018. In no case shall any work be commenced prior to receipt of formal Notice to Proceed by the City of Ann Arbor.

All work in this contract shall be completed on or before November 9, 2018.

The work shall be completed in a methodical sequence of activity (or “stages”) moving through the project site, as indicated on the *Construction Phasing Plan* and *Traffic Maintenance Plans*; and within the Phases noted on the plans and herein. The Contractor may propose alternative ideas to the phasing and scheduling of the work for consideration by the City of Ann Arbor and the DDA. If, after consideration, the Engineer believes that the alternative proposed is beneficial to the City and DDA, they may opt to accept the proposed alternative.

Phase 1 Water Main Work shall be completed first; the Contractor shall then proceed into Phase 2 Water Main Work. For Phase 1 and 4 one lane of one way traffic must be maintained on Fifth Avenue as noted on plans, and as noted herein.

One southbound lane of traffic must be maintained on Fifth Avenue throughout the project area as follows:

1. From project commencement until June 18, 2018.
2. During the Ann Arbor Art Fair, July 18-July 22, 2018.
3. From September 4, 2018 through project completion

Phases 3 and 4 may not proceed until June 18, 2018. Following June 18, 2018, work may proceed in all phases of work concurrently.

Work must be sequenced such that ADA-compliant and concrete paved thru pedestrian access on each side of each block is restricted no longer than 14 consecutive calendar days. Within those 14 days, temporary ADA-compliant pedestrian access into each business must be maintained during the business’ hours. Continuous, thru pedestrian access must be maintained on at least one side of each block at all times.

Pedestrian access to all business, public and private buildings must be maintained throughout the construction period. At least one pedestrian crossing of Fifth Avenue between Station 4+50 and Station 6+50 must be maintained at all times, and shall be appropriately surfaced, signed, and secured. All pedestrian access shall be ADA compliant.

Vehicular and pedestrian access must be provided to the parking lot that serves Community High School throughout the construction period. Access to driveways on Fifth Avenue near Station 5+00, and between Stations 7+75 and 8+50, and on Detroit Street near Station 22+50, must be maintained throughout the construction period, except when interrupted by paving operations or when water main installation prohibits such access. The Contractor will make reasonable efforts to minimize disruption of access.

Landscape maintenance will occur from September 2018 – November 2020.

The Contractor may propose to adjust the limits or sequencing of construction in order to complete the work more efficiently. Changes to the recommended construction sequence must be approved in writing by the Engineer prior to construction and must assure all required coordination with other projects and time lines.

Time is of the essence in the performance of the work of this contract. The Contractor is expected to mobilize sufficient personnel and equipment, and work throughout all authorized hours in order to complete the project by the final completion date. Costs for the Contractor to organize, coordinate, and schedule all of the work of the project, will not be paid for separately, but shall be included in the bid price of the Contract Item "General Conditions."

Liquidated damages will be charged for delays within each phase, in the amount of \$500 per calendar day. This includes delays to pedestrian access as specified above.

The approved low bidder(s) for the work covered by this proposal will be required to meet with the Engineer to work out a detailed Progress Schedule. The schedule for this meeting will be set within two weeks after the approved low bidder is determined. The low bidder will also submit for review and approval a sequence of operation/staging plan to complete the work by the specified completion date.

The named subcontractor(s) for Specialty and/or Designed Items (if such items are designated in the proposal) which materially affect the work schedule shall also be present at the scheduled meeting, and they will be required to sign the Progress Schedule to indicate their approval of the scheduled dates of work set forth in the Progress Schedule.

The Engineer will arrange the time and place for the meeting.

The Plans and Special Provisions describe further logistics, coordination and scheduling requirements of the Project, which shall be included in the Progress Schedule and otherwise conformed to. Work will be allowed from 7am – 8pm, Monday – Saturday.

Work beyond these hours is subject to the approval of the Engineer, and subject to approval of an extended hours work permit application by the City of Ann Arbor.

No work may be performed on Memorial Day, Independence Day, Labor Day or on the event dates shown below:

- Ann Arbor Street Art Fair, July 18-July 22, 2018

Any costs associated with down time, demobilizing/remobilizing, temporary paving or restoration, temporary pavement markings, and removal/replacement of traffic control devices required due to these events and downtimes shall be included in contract pay item "Item No 101, General Conditions," and it will not be paid for separately.

**DETAILED SPECIFICATION
FOR
ITEM #101 - GENERAL CONDITIONS, MAX \$200,000**

DESCRIPTION

This item shall include all work described and required by the Plans and Specifications for which no item of work is listed in the Bid Form, including but not limited to:

- Scheduling and organization of all work, subcontractors, suppliers, testing, inspection, surveying, and staking
- Coordination of, and cooperation with, other contractors, agencies, departments, and utilities
- Protection of Utilities
- Placing, maintaining, and removing all soil erosion and sedimentation controls
- Maintaining drainage
- Maintaining drives, drive openings, sidewalks, pedestrian building access, mail deliveries, and solid waste/recycle pick-ups
- Storing all materials and equipment off lawn areas
- Coordination efforts to furnish various HMA mixtures as directed by the Engineer
- Furnishing and operating vacuum-type street cleaning equipment
- Furnishing and operating vacuum-type utility structure cleaning equipment
- Furnishing and operating both vibratory plate and pneumatic-type (“pogo-stick”) compactors
- Furnishing and operating all equipment required to completed the proposed work activities as specified
- Noise and dust control
- Furnish and install temporary barricades and fencing at excavation areas to protect workers and people in the work area.
- Mobilization(s) and demobilization(s)
- Furnishing submittals and certifications for materials and supplies
- Disposing of excavated materials and debris
- All miscellaneous and incidental items such as overhead, insurance, and permits.
- Interim and final site cleanup, including, but not limited to removal and disposal of excess materials, removal of all dirt and deleterious materials, power washing pavements, removal of all packing materials and labels, etc.

MEASUREMENT AND PAYMENT

This item of work will be paid for on a pro rata basis at the time of each progress payment. Measurement will be based on the ratio between work completed during the payment period and the total contract amount. When all of the work of this Contract has been completed, the measurement of this item shall be 1.0 Lump Sum.

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

<u>PAY ITEM</u>	<u>PAY UNIT</u>
General Conditions, Max \$200,000	Lump Sum

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the

work specified in the City Standard Specifications and as modified by this Detailed Specification.

**DETAILED SPECIFICATION
FOR
ITEM #102 – AUDIO VISUAL TAPE COVERAGE**

DESCRIPTION

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

The audio-visual filming shall be:

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

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

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

PRODUCTION

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

1. DVD Format, No Editing - The filming shall be done in color using equipment that allows audio and visual information to be recorded. Splicing or editing of the tape shall not be allowed and the speed and electronics of the videotaping equipment and DVD shall be equal to that which is standard to the video taping industry.
2. Perspective/Speed/Pan/ Zoom - To ensure proper perspective, the distance from the ground to the camera lens shall not be less than 10 feet and the filming must proceed in the general direction of travel at a speed not to exceed 48 feet per minute. Pan and zoom rates shall be controlled sufficiently so that playback will ensure quality of the object viewed.
3. Display - The recording equipment shall have transparent time, date stamp and digital annotation capabilities. The final copies of the tape shall continuously and simultaneously display the time (hours:minutes:seconds) and the date (month/date/year) in the upper left-hand corner of the frame. Accurate project stationing, where applicable, shall be included in the lower half of the frame in standard format (i.e. 1+00). Below the stationing periodic information is to be shown, including project name, name of area shown, street address, direction of travel, viewing direction, etc.

If in the event, the stationing has not been established on-site, refer to the plans and approximate the proposed stationing. 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 filming route. Additional audio commentary shall be provided as necessary during filming to describe streets, buildings, landmarks, and other details, which will enhance the record of existing conditions.

4. Visibility/Ground Cover - The filming shall be performed during a time of good visibility. Filming shall not be performed during periods of precipitation or when snow, leaves, or other natural debris obstruct the area being filmed. The Contractor shall notify the Engineer in writing in the event that the weather or snow cover is anticipated to cause a delay in filming.

COVERAGE

The audio-visual film coverage shall include the following:

1. General Criteria - This general criteria shall apply to all filming and shall include all areas where construction activities will take place or where construction vehicles or equipment will be operated or parked and or where materials will be stored. The filming shall extend an additional 50 feet outside of all areas. The filming 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.
2. The filming shall include all the street adjacent walls of the basements of buildings in the project area. The Contractor shall request access from building owners, and document the buildings for which access was denied or otherwise not reasonably made available.
3. Other Areas - The Contractor shall film at his sole expense other areas where, in his/her opinion, the establishment of a record of existing conditions is warranted. The Contractor shall notify the Engineer in writing of such areas.
4. Street List – This item shall include the filming all of the streets as listed in the Detailed Specification for Progress Schedule and Construction Limits.

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

AUDIOVISUAL FILMING SERVICES

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

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

MEASUREMENT AND PAYMENT

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

PAY ITEM

PAY UNIT

Audiovisual Tape CoverageLump Sum

Audiovisual Tape Coverage shall include all labor, equipment, and materials required to perform the filming and to provide the finished videotape the Engineer. The unit price includes filming the entire project limits, for each and every street, as described above.

**DETAILED SPECIFICATION
FOR
ITEM #104 - Certified Payroll Compliance and Reporting**

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.

GENERAL

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

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

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

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

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.

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.

**DETAILED SPECIFICATION
FOR
ITEM #120 - PROJECT SUPERVISION, MAX \$100,000**

DESCRIPTION

The Contractor shall designate a full-time Project Supervisor to act as the Contractor's agent/representative, and to be responsible for scheduling and coordination of all subcontractors, suppliers, other governmental agencies, and all public and private utility companies. The Project Supervisor shall also be responsible for communicating the work schedule with all impacted businesses.

The Project Supervisor shall not be an active crew member of the Contractor, shall not be an active member or employee of any subcontractor's work force, and shall not perform general or specialized labor tasks.

Prior to the pre-construction meeting, the Contractor shall designate a proposed Project Supervisor by name, and shall furnish the City of Ann Arbor and the DDA with a current, thorough, detailed summary of the proposed Project Supervisor's work history, outlining all previous supervisory experience on projects of a similar size and nature. The detailed work history shall include personal and professional references (names and phone numbers) of persons (previous owners or agents) who can attest to the qualifications and work history of the proposed Project Supervisor. Proposed candidates for Project Supervisor shall have a demonstrated ability to work harmoniously with the City, DDA, the public, subcontractors, and all other parties typically involved with work of this nature. The Project Supervisor shall be able to demonstrate that they have filled a supervisory role on at least three projects of similar scope and size within the last 5 years. The Supervising Professional, Engineer, and DDA will have the authority to reject a proposed Project Supervisor whom he/she considers unqualified.

The Project Supervisor shall be available 24 hours-per-day to provide proper supervision, coordination and scheduling of the project for the duration of the Contract. The Contractor shall furnish the DDA with telephone numbers of the Project Supervisor in order to provide 24 hour-per-day access during business and non-business hours, including weekends and holidays.

The Project Supervisor shall be equipped by the Contractor with a mobile telephone to provide the DDA with 24 hour-per-day access to him/her during daily construction activities, during transit to and from the construction site, and during all non-business hours including weekends and holidays.

The Project Supervisor shall be equipped with assistants as necessary to provide project supervision as specified herein, and in accordance with the Contract.

DUTIES AND RESPONSIBILITIES

The Project Supervisor work harmoniously with the City, DDA, the public, subcontractors, and all other parties typically involved with work of this nature.

The Project Supervisor shall have a thorough, detailed understanding and working knowledge of all construction practices and methods specified elsewhere herein, as well as the handling, placement, testing and inspection of aggregates, aggregate products, landscape materials, electrical equipment, pre-cast unit pavers, HMA concrete, and Portland cement concrete materials.

The Project Supervisor shall be responsible for all of the work of all of the Contractor's, subcontractors' and suppliers' work forces.

The Project Supervisor shall be responsible for proper and adequate maintenance (emissions, safety, and general operation) of all of the Contractor's, subcontractors' and suppliers' equipment and vehicles.

The Project Supervisor is responsible to assure that mail delivery, solid waste, and recycling pick-ups are uninterrupted by the construction.

The Project Supervisor is responsible to coordinate deliveries to the local businesses.

The Project Supervisor shall be responsible for the legal, proper and safe parking/storage of all of the Contractor's, subcontractors' and suppliers' equipment, work vehicles, and employee's vehicles.

The Project Supervisor shall schedule and coordinate the work of all parties involved in the project, including utility companies, testing agencies, governmental agencies, all City departments (such as Utilities and Transportation), the DDA and/or City inspectors, and the impacted businesses.

The Project Supervisor shall coordinate and schedule the work of any independent survey crews that may be retained by the City or DDA to witness and reset existing and new geographic/benchmark monuments. Failure to have existing monuments witnessed and reset may result in delays to the Contractor's work. Costs for such delays will be the Contractor's sole responsibility.

The Project Supervisor shall coordinate and schedule both testing inspectors and City and DDA inspectors in a timely manner, to assure proper and timely testing and inspection of the work.

The Project Supervisor shall review the Inspector's Daily Reports (IDRs) for accuracy, and shall sign all IDRs on a daily basis as the representative of the Contractor. Items to be reviewed include descriptions, locations and measurements of quantities of work performed, workforce, equipment, and weather. The Project Supervisor shall also be responsible for its subcontractors' review and initialing of IDRs containing work items performed by each respective subcontractors.

The Project Supervisor shall submit to the Engineer, an updated, detailed schedule of the proposed work on a weekly basis, and an update of all proposed changes on a daily basis, all in accordance with the Detailed Specification for Project Schedule contained elsewhere herein.

The Project Supervisor shall schedule and chair a weekly progress meeting with the Engineer and all subcontractors to discuss the work. Upon the completion of each meeting, the Project Supervisor shall prepare and distribute, to all present, a written summary of the meeting's minutes. Those in attendance shall review the minutes and, if necessary, comment on any deficiencies or errors prior to or at the next scheduled progress meeting.

The Project Supervisor shall engage with the affected businesses to communicate expectations for the work and to adjust the construction methods and/or times to best accommodate the local businesses.

ADDITIONAL PERFORMANCE REQUIREMENTS

If, in the sole opinion of the Supervising Professional, the Project Supervisor is not adequately performing the duties as outlined in this Detailed Specification, the following system of notices will be given to the contractor with the associated penalties:

First Notice – A warning will be issued in writing to the contractor detailing the deficiencies

in the Project Supervision. The contractor must respond within 7 calendar days in writing with a plan to correct the stated deficiencies. Failure to respond within 7 calendar days will result in the issuing of a second notice.

Second Notice – A second warning will be issued in writing to the contractor further detailing the deficiencies in the Project Supervision. The contractor must respond within 7 calendar days in writing with a plan to correct the stated deficiencies. Failure to respond within 7 calendar days will result in the issuing of a third notice. A deduction of 10% will be made from the original Project Supervision contract amount. At this time, the DDA reserves the right to meet with personnel with the necessary authority within the Contractor’s organization to discuss the deficiencies in the Project Supervision.

Third Notice – An additional deduction of 25% will be made from the original Project Supervision contract amount, and the Project Supervisor shall be removed from the project, and replaced immediately with another individual to be approved by the Supervising Professional.

Should, in the sole opinion of the Supervising Professional, the Project Supervisor fail to perform his/her duties and responsibilities as described herein to such a degree that the successful completion of the project is put in jeopardy, the above system of notices may be foregone, and the Contractor shall immediately replace the Project Supervisor upon receipt of written notice. Failure to provide adequate project supervision, as determined by the Engineer, shall be considered basis for the Supervising Professional to suspend work without extension of contract time or additional compensation.

MEASUREMENT AND PAYMENT

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

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

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Project Supervision, Max \$100,000	Lump Sum

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

**DETAILED SPECIFICATION
FOR
ITEM #203 - MINOR TRAFFIC DEVICES, MAX \$45,000**

DESCRIPTION

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

- The furnishing and operating of miscellaneous signs, warning devices, and cones;
- The provision of flag persons;
- The operation of additional signs furnished by the City of Ann Arbor or the DDA;
- Maintaining pedestrian traffic;
- Temporarily covering traffic controls;
- Temporarily covering existing signs as directed;
- Any and all other miscellaneous and/or incidental items which are necessary to properly perform the work.

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

MEASUREMENT AND PAYMENT

This item of work will be paid for on a pro rata basis at the time of each progress payment. Measurement will be based on the ratio between work completed during the payment period and the total contract amount. When all of the work of this Contract has been completed, the measurement of this item shall be 1.0 Lump Sum.

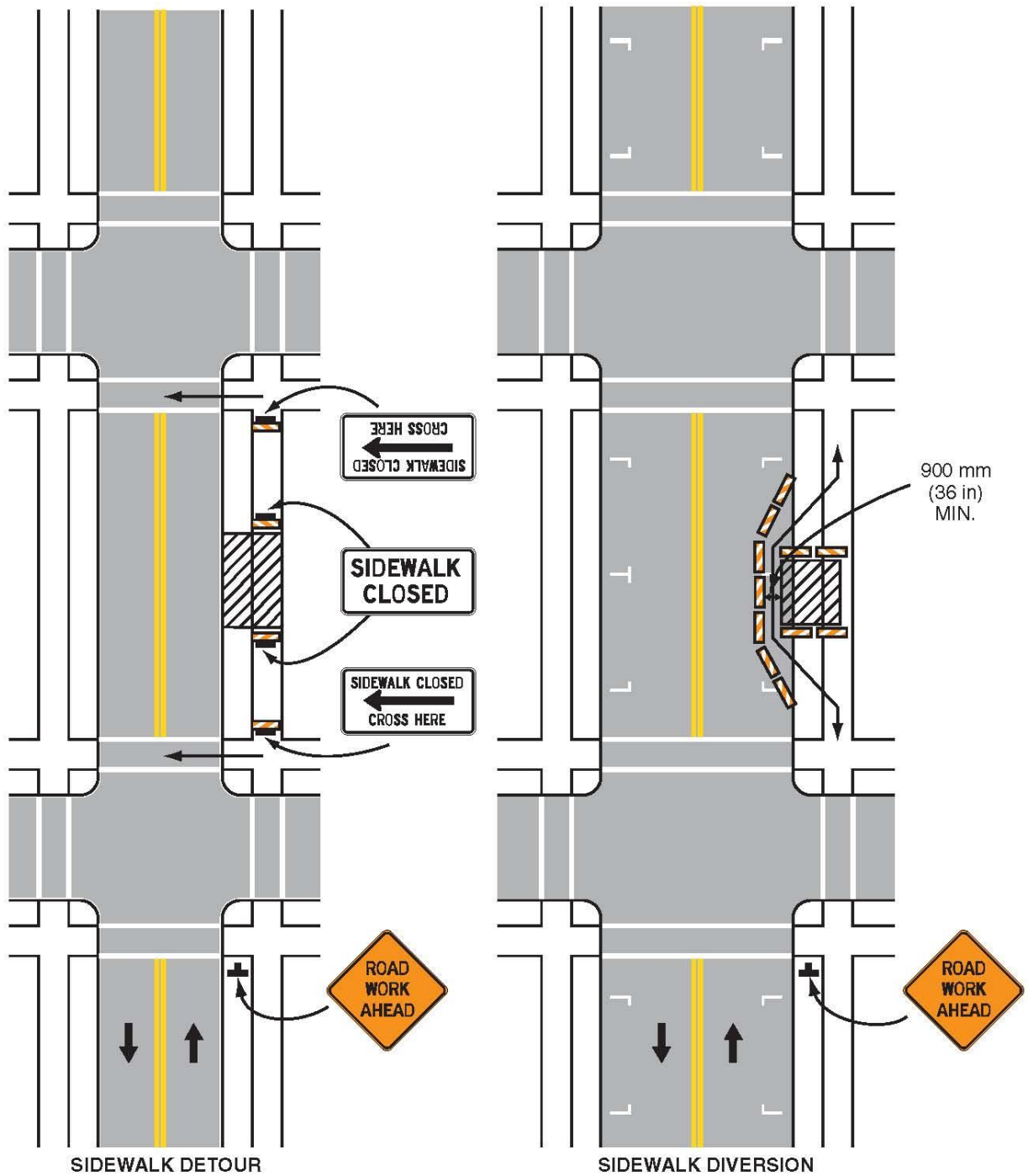
The completed work as measured for this item of work will be paid for at the Contract Unit Price for the following Contract (Pay) Item:

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Minor Traffic Devices, Max \$45,000.....	Lump Sum

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



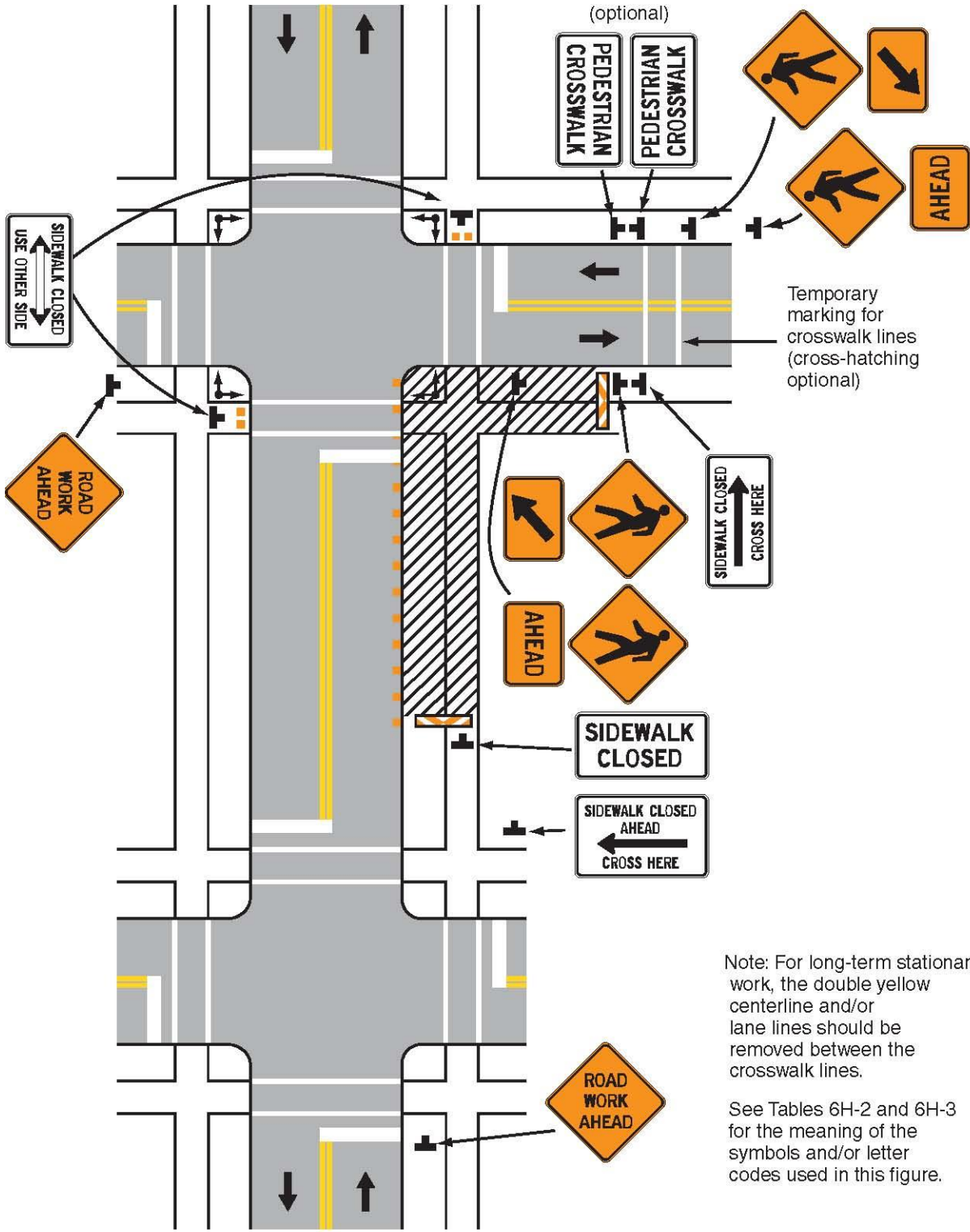
Figure 6H-28. Sidewalk Detour or Diversion (MI) (TA-28)



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Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.
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Figure 6H-29. Cross walk Closures and Pedestrian Detours (MI) (TA-29)



Note: For long-term stationary work, the double yellow centerline and/or lane lines should be removed between the crosswalk lines.

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

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**DETAILED SPECIFICATION
FOR
ITEM #204 - NON-HAZARDOUS CONTAMINATED MATERIAL HANDLING AND DISPOSAL**

a. Description. This work shall include all labor, equipment, and materials necessary to handle, transport, and dispose of non-hazardous contaminated material as described herein, as directed by the Engineer.

An area within the project limits has been identified as a potential site of soils which include non-hazardous contaminated material. Should the City determine that soils in the project site include non-hazardous contaminated material these materials shall not be used elsewhere or disposed of in a manner inconsistent with this special provision, or applicable federal, state, or local regulations unless otherwise directed by the Engineer.

b. Method of Construction. This work shall be performed in accordance with Sections 204 and 205 of the MDOT 2012 Standard Specifications for Construction, except as modified herein or as directed by the Engineer.

The Contractor shall have all manifests signed by its representative, the Engineer's representative, the authorized representative of the waste hauler and the waste disposal facility.

c. Excavation of Non-Hazardous Contaminated Material. Non-Hazardous contaminated material shall be excavated as directed by the Engineer.

d. Temporary Storage of Non-Hazardous Contaminated Material. Excavated non-hazardous contaminated material which is to be temporarily stockpiled shall be placed on plastic sheeting or tarps having a minimum thickness of 6 mils or in trucks, roll-off boxes, or other containers, such that no liquid may escape from the containment. At the end of each work day, the non-hazardous contaminated material shall be covered securely with plastic sheeting of 6 mils thickness or greater.

Excavated non-hazardous material shall be disposed of as soon as approval is received from the disposal site. In no case shall this material be stockpiled for longer than 30 days prior to disposal.

The Contractor is responsible for the necessary coordination such that his/her work activities are not adversely impacted by the stockpiling of contaminated soil. Stockpiled soil shall not impair sight distance or drainage.

e. Sampling and Analysis of Non-Hazardous Contaminated Material. City staff and the Engineer shall be notified of excavation in the identified area of concern. Should the city determine that the materials being excavated potentially contain non-hazardous contaminated material, the Contractor shall excavate soils in the area, stock pile materials and/or leave the materials in-situ, as directed by the Engineer.

During the period following excavation and stockpiling, and prior to loading and removal of the soils, the Contractor will be directed to proceed with work in other areas of the project, should other areas be available for work within the project area and in compliance with the project schedule and Progress Clause. Any downtime related to the discovery, excavation, stockpiling, testing, loading and hauling of the non-hazardous contaminated material will not be paid for separately.

The City will be responsible for the costs associated with testing of the soils to determine the nature and

extent of the contamination. Reports related to any testing will be provided to the Contractor.

The information contained in this report shall be utilized to secure a Type II disposal facility for disposal of the non-hazardous contaminated material. The contractor shall be responsible for preparing any forms or applications required by the disposal facility prior to their acceptance of the non-hazardous contaminated material for disposal.

The contractor shall also be responsible for familiarizing themselves with the information contained in the report and adjusting their operations accordingly to meet the safety and health requirements as set forth in Section 104.07.B of the MDOT 2012 Standard Specifications for Construction.

f. Disposal of Non-Hazardous Contaminated Material. Disposal of non-hazardous contaminated material shall be at a licensed Type II sanitary landfill. The Contractor shall submit at the preconstruction meeting the name of the Type II landfill to be used for disposal, the sampling and analysis requirements of the landfill, and verification that the use of the proposed landfill will meet the requirements of the County solid waste plan.

g. Measurement and Payment. The completed work as described will be paid for at the contract unit price for the following contract item (pay item):

PAY ITEM

PAY UNIT

Non-Hazardous Contaminated Material Handling and Disposal (LM)Cubic Yard

Non-Hazardous Contaminated Material Handling and Disposal will be measured by volume in cubic yards, loose measure, as contained in the hauling unit. Under no circumstance will the Contractor be paid for quantities of this material that have not been approved for payment by the Engineer and as measured and tracked by the Engineer and the Contractor. The Contractor will not be paid “standard amounts” that have been determined by the disposal facility; only measured volumes as computed by the Engineer will be paid. Prior to payment, the Engineer shall be given receipts from the disposal facility for the number of cubic yards disposed of at that facility. Payment shall include all costs for materials, labor and equipment needed for storage, loading, transportation, and disposal of the non-hazardous contaminated material. Disposal costs shall include all documentation required by the landfill. Payment for this item shall be the same, regardless of whether or not the Contractor temporarily stores the contaminated material; the Contractor shall not be paid for re-handling of the material due to construction staging, stockpiling, or other related activities.

Payment for excavation of non-hazardous contaminated materials shall be included with the related items of work.

**DETAILED SPECIFICATION
FOR
ITEM #205 – MACHINE GRADING, MODIFIED
ITEM #207 PLAZA AMENITIES, REM AND SALVAGE**

DESCRIPTION

This work shall consist of constructing earth grades by excavating, cutting, filling, trimming, and grading; general restoration, removal and salvage of miscellaneous site amenities, and sign removals in accordance with the Detailed Specifications elsewhere herein; and maintaining the work in a finished condition until such time that it is accepted by the Engineer. This work shall be done as shown on the Plans, as detailed in the Specifications, and as directed by the Engineer, and in accordance with Section 205 of the 2012 MDOT Standard Specification for Construction, except as specified herein.

CONSTRUCTION METHOD

Machine Grading:

The Contractor shall construct earth grades as required to develop the typical and/or detailed cross-section(s) as shown on the Plans, as detailed in the Specifications, and as directed by the Engineer. This shall include, but not be limited to, the excavation of soil, rocks of any size, stumps, logs, and bricks; the removal and proper disposal off-site of surplus excavated material; the scarifying, plowing, disking, moving and shaping of earth; the trimming, grading, compaction and proof-rolling of the prepared subgrade; the importing, furnishing, placement and compaction of embankment and/or fill materials; the full depth saw-cutting of pavement at the removal limits; the grading of sideslopes; general restoration in accordance with the detailed Specifications elsewhere herein and the general items of the work as specified herein. Road subbase and base materials shall be paid for separately.

The Contractor shall remove, add to, re-shape, re-grade, and re-compact the existing roadbed materials, and shall construct the roadway and sidewalk area to the cross-section(s) as indicated on the Plans, as detailed in the Specifications, and as directed by the Engineer.

The existing site may include irrigation system that is to be abandoned. As part of Machine Grading the Contractor is to insure that the system is no longer active with water pressure, then remove any remaining irrigation equipment uncovered during the work, and properly dispose of all materials off site.

As part of Machine Grading the Contractor shall remove other surface features, including signs, concrete filled steel bollards, and bicycle parking hoops located within the grading limits and not otherwise identified, as directed by the Engineer. Signs shall be salvaged and provided to City as directed by the Engineer.

The Contractor shall move excavated and/or imported materials longitudinally and/or transversely where necessary, and as directed by Engineer.

The Contractor shall keep the project site well graded and drained at all times.

The Contractor shall not use rubber-tired equipment on the subgrade, when its use causes or may cause, in the opinion of the Engineer, damage to the subgrade. The Contractor shall conduct its operation(s), and provide all necessary equipment, to insure the satisfactory completion of the work without damaging the subgrade. This includes the transporting, stockpiling, re-handling, and movement of materials over additional distances, in lieu of driving on an unprotected, or partially unprotected, subgrade.

The Contractor is solely responsible for the maintenance and protection of the subgrade. Further, any damage to the subgrade which, in the opinion of the Engineer, is caused as a result of the Contractor's operation(s), or its subcontractors' or suppliers' operation(s), shall be repaired by the Contractor at the Contractor's expense. This includes any additional earthwork and/or maintenance materials as directed by the Engineer, for the purposes of the Contractor's maintenance and protection of the subgrade. The Contractor shall not be entitled to any additional compensation for the implementation of these procedures.

The Contractor shall perform all rough and/or finish grading and compaction in the right of way to the grades shown on the Plans, as detailed in the Specifications, and as directed by the Engineer.

The Contractor shall proof roll all graded and compacted surfaces in the presence of the Engineer as detailed in the Specifications. The Engineer will monitor the proof rolling operation to locate deleterious and/or uncompacted materials, and will direct undercuts as necessary.

The Contractor shall take any and all steps necessary to avoid interruption in the mail delivery, and solid waste, recycling, and compostable pick-up within the project limits. This shall include the temporary relocation of mailboxes, where required by the Engineer, as well as moving of all solid waste/recycling/compost containers to the nearest cross street.

The Contractor shall coordinate with the City Forester prior to the removal of any tree roots 2 inches or larger in size.

Machine Grading includes reviewing the condition of existing sand base in sidewalk areas with the Engineer, and grading and compacting the subgrade and sand to meet grade requirements for the sidewalk zone. If the existing sand base must be removed due to poor condition, the removal will be paid for as part of Machine Grading, Modified, and the replacement sand base paid as Sand Subbase Course, Class II - C.I.P.

The Contractor shall restore all disturbed areas to better than or equal to their original condition. This includes the placement and compaction of 2.5 inches of topsoil, followed by the placement of grass seed, followed by the placement of 0.5 inches of topsoil at all turf restoration locations, and at locations where concrete items are removed and turf is to be established. All restoration work and materials shall be in accordance with the City Standard Specifications. Restoration work must be performed within one week of the placement of the wearing course for each street. Such restoration will be considered part of Machine Grading.

Plaza Amenities, Rem. and Salvage

The contractor is to remove the following from the plaza areas adjacent to the Farmer's Market:

1. Two benches, to be salvaged and reinstalled by contractor at a location within the project area to be determined by the Engineer.
2. One precast concrete planter, to be salvaged and reinstalled by contractor at a location within the project area to be determined by the Engineer.
3. One solar display kiosk, salvage to City for modification and repair, reinstalled by contractor at a location within the project area to be determined by the Engineer.
4. One stainless steel and glass historic marker, to be salvaged and reinstalled by contractor where noted on plans.
5. One set of five "carrot" themed bike hoops to be salvaged to the DDA for refinishing by the DDA, and then reinstalled by the contractor in the project area, at a location to be determined by the engineer.
6. One Directory Sign, to be salvaged and reinstalled by contractor at a location within the project

area to be determined by the Engineer.

This contract assumes that the Contractor has inspected these items and is familiar with their features, and understands the actions which much take place in order to complete the tasks noted above. All removals shall be accomplished without damage to buildings, light pole, site amenities, pavement to remain, and related site features.

MEASUREMENT AND PAYMENT

Measurement for payment for the item “Machine Grading Modified” shall be the computed by road station (as further described below) and the quantity of excavated material (soil, rock, brick, etc.) to the bottom of the excavation. Embankment, fill, subgrade protection/maintenance, and drainage maintenance will not be paid for separately, and are included in this item of work.

Reinstallation of Plaza Amenities is paid for separately.

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

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Machine Grading, Modified.....	Station
Plaza Amenities, Rem and Salvage.....	Lump Sum

The unit prices for **Machine Grade Modified, and Plaza Amenities, Rem and Salvage** shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this detailed Specification.

“Station” in the **Machine Grading, Modified** pay unit is defined as a one hundred foot length of street as stationed on the plans; each “Station” pay unit is measure longitudinally for every 100 feet or fraction thereof, and is measure from the center line of the right of way to the edge of the right of way (that being one half of the right of way).

**DETAILED SPECIFICATION
FOR
ITEM #208 - GEOTEXTILE
ITEM #209 - GEOGRID
ITEM #210 - STONE RESERVOIR**

DESCRIPTION AND MATERIALS

This work includes stone reservoir trenches, and geosynthetic materials, as specified herein, as shown on the Plans, and as directed by the Engineer.

RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, City Standard Specification, and MDOT 2012 Standard Specifications for Construction (as well as applicable Special Provisions as referenced herein) apply to this Section.

SUBMITTALS

- A. Aggregates/Sand:
 - 1. Source: Must be MDOT approved.
 - 2. Aggregate gradation and percent voids (porosity).
- B. Admixtures: Certification from MDOT approved supplier.
- C. Geotextile and Geogrid: Product Certifications and specifications from manufacturer.

QUALITY CONTROL/QUALITY ASSURANCE

- A. Installation Personnel Qualifications:
 - 1. Trained and experienced in the fabrication and installation of the materials and equipment.
 - 2. Knowledgeable of the design.
- B. Testing: The City of Ann Arbor and DDA's representative shall perform testing to ensure compliance with the materials specifications as required by the Engineer.
- C. Weight Slips:
 - 1. Furnish weight slips for material incorporated in the Project.
 - 2. Verify that the required tonnage has been applied by calculating and submitting yield for each day of work.

DELIVERY, STORAGE AND HANDLING

- A. Handle and store materials in a manner which will prevent deterioration, damage, contamination with foreign matter, and damage by weather or elements, and according to Manufacturer's directions.
- B. Protection: Use all means necessary to protect the materials of this Section before, during, and

after installation.

- C. Reject damaged, deteriorated or contaminated material and immediately remove from the Site. Replace rejected materials with new materials at no additional cost to Owner.

MATERIALS

- A. Aggregate/Sand Materials:
 - 1. Stone Reservoir:
 - a. MDOT 6AA
 - 1) Washed.
 - 2) Thickness and width: as shown on Plans.
- B. Geotextile
 - 1. Nonwoven.
 - 2. Minimum Properties:
 - a. Weight - 6 oz.
 - b. Marafi 160N, TerraTex N06, US Fabric 165 NW, or approved equal.
- C. Geogrid
 - 1. Polypropylene triaxial grid.
 - 2. Minimum Properties:
 - a. Minimum Rib Thickness: 0.03 inches (0.76 mm)
 - b. Tensile Strength @2% Strain (ASTM D6637): 280 lbs/ft
 - c. Tensile Strength @5% Strain (ASTM D6637): 580 lbs/ft
 - d. Ultimate Tensile Strength (ASTM D6637): 850 lbs/ft
 - e. Flexural Stiffness (ASTM D5732): 250,000 mg-cm
 - f. Resistance to Installation Damage (ASTM D5818 & D6637): 93%
 - g. Tensar TX 5 or approved equal.

CONSTRUCTION METHODS

PREPARATION

- A. Final Subgrade Preparation:
 - 1. Avoid compaction of subgrade soil unless directed or approved by Engineer.
 - 2. Scarify compacted or disturbed subgrade soils to a minimum depth of 6 inches with York rake; or equivalent method and light tractor.
 - 3. Remove accumulation of fine materials due to ponding or surface erosion with light equipment.
 - 4. Conform to line, grade, and elevations indicated.
 - a. Excavate, fill, re-grade, and scarify areas damaged by erosion, ponding or traffic compaction.
 - b. Use light equipment.
 - 5. Proof Roll:
 - a. To identify soft or unstable areas.
 - b. Use light equipment, avoid over compacting subgrade.
 - 6. Do not place geotextile or geogrid until subgrade surface has been inspected and approved by Engineer.
- B. Stone Reservoir Trench & Geotextile

1. Begin installation of stone reservoir immediately after approval of subgrade preparation.
2. Do not place sand or aggregate materials on a frozen base, subbase, or subgrade.
3. Remove any accumulation of debris or sediment which has taken place after approval of subgrade and installation of stone reservoir and prior to installation of the geotextile, at the contractor's expense.
4. Place geotextile in accordance with Manufacturer's standards and recommendations.
 - a. Overlap Adjacent Strips: Minimum 16 inches.
 - b. Prevent runoff or sediment from entering the stone reservoir.
5. Place backfill for stone reservoir in uniform layers such that when compacted, they have the thicknesses shown on the Plans, or as directed by the Engineer.
 - a. The loose measure of any layer -- not more than 9-inches or less than 4-inches.
 - b. Compact backfill to a minimum of 95% of the maximum density per City Standard Specifications.
6. The Stone Reservoir is to be completely wrapped in geotextile fabric.

C. Geogrid Installation:

1. Place geogrid and aggregate base course immediately after installation of stone reservoir.
2. Remove any accumulation of debris or sediment which has taken place after approval of subgrade and installation of stone reservoir prior to installation of the geogrid, at the contractor's expense.
3. Place geogrid in accordance with Manufacturer's standards and recommendations.
 - a. Overlap Adjacent Strips: Minimum 16 inches.
 - b. Tie together overlapping strips 24 inches on center, as directed by Engineer.
 - c. Prevent runoff or sediment from entering the storage bed.
4. Place aggregate base course to grades indicated on Drawings.
 - a. Maximum Lift Thickness: 10 inches.
 - b. Minimum Lift Thickness: 6 inches.
 - c. Compact each layer to a minimum of 95-98% (varies with paving materials) of the maximum density per City Standard Specifications.
 - d. Fine grade as necessary to conform to elevations and cross section indicated on the Drawings.
 - e. Roll aggregate layer with paving roller until smooth, as directed by Engineer.

MEASUREMENT AND PAYMENT

The items of work included in this Detailed Specification shall be paid for at the Contract Unit Price, which shall be payment in full for all labor, material and equipment needed to accomplish all the work described in this detailed specification, which includes, but is not limited to: furnishing, placement, and compaction of all aggregate materials and furnishing and placement of geotextile or geogrid.

Price adjustments shall be enforced by the City of Ann Arbor and DDA if materials are not in accordance with specifications.

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

PAY ITEM

PAY UNIT

Geotextile.....	Square Yard
Geogrid	Square Yard

Stone Reservoir.....Cubic Yard

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

**DETAILED SPECIFICATION
FOR
ITEM #215 – INFILTRATION INLET – 48-INCH DIAMETER**

DESCRIPTION

This work shall consist of installing storm water leaching basin structure. The Contractor shall furnish all labor, equipment and materials necessary to install the structure and appurtenances specified in the Plans and these specifications.

These units shall be installed as detailed on the plans or as configured according to reviewed and approved shop drawings submitted by the Contractor.

MATERIALS

All materials shall conform to City standards and specifications. Precast concrete components shall conform to applicable sections of ASTM C 478, ASTM C 857 and ASTM C 858 and the following:

1. Concrete shall achieve a minimum 28-day compressive strength of 4,000 pounds per square-inch (psi);
2. The precast concrete sections shall be designed to withstand lateral earth and AASHTO H-20 traffic loads;
3. Cement shall be Type III Portland Cement conforming to ASTM C 150;
4. Aggregates shall conform to ASTM C 33;
5. Reinforcing steel shall be deformed billet-steel bars, welded steel wire or deformed welded steel wire conforming to ASTM A 615, A 185 or A 497, respectively;
6. Joints shall be sealed with preformed joint sealing compound conforming to ASTM C 990 and
7. Shipping of components shall not be initiated until a minimum compressive strength of 4,000 psi is attained or five (5) calendar days after fabrication has expired, whichever occurs first.
8. Geotextile fabric and Geogrid materials as noted in the appropriate detailed specification.

A. Internal Components and Appurtenances

Internal Components and appurtenances shall conform to the following:

1. Screen and support structure shall be manufactured of Type 316 and 316L stainless steel conforming to ASTM F 1267-01;
2. Hardware shall be manufactured of Type 316 stainless steel conforming to ASTM A 320;
3. Access system(s) conform to the following:
 - a. Manhole castings shall be designed to withstand AASHTO H-20 loadings and manufactured of cast-iron conforming to ASTM A 48 Class 30.
 - b. Casting and rim per plans and City Standard Specifications.

Submittals

The Contractor shall prepare and submit shop drawings in accordance with the contract documents at least two weeks prior to installation. The shop drawings shall detail horizontal and vertical dimensioning, reinforcement and joint type and locations.

The Contractor shall submit four (4) sets of shop drawings sealed by a Professional Engineer in the State

of Michigan certifying the above requirements to the City and the DDA, and showing details for the storm water inlet. The submittal should also include laboratory test results for the proposed units and references for local projects where the units have been installed. These documents must be reviewed and approved prior to the start of construction.

CONSTRUCTION METHODS

Handling and Storage

1. The Contractor shall exercise care in the storage and handling of the structure prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted and unloading has commenced shall be borne by the Contractor.
2. The work shall be completed by a Contractor approved by the City and DDA.
3. The structure shall be installed in accordance with the manufacturer’s recommendations and related sections of the contract documents. The manufacturer shall provide the Contractor installation instructions and offer on- site guidance during the important stages of the installation as identified by the manufacturer at no additional expense. A minimum of 72 hours’ notice shall be provided to the manufacturer prior to their performance of the services included under this subsection.
4. The Contractor shall fill all voids associated with lifting provisions provided by the manufacturer. These voids shall be filled with non-shrinking grout providing a finished surface consistent with adjacent surfaces. The Contractor shall trim all protruding lifting provisions flush with the adjacent concrete surface in a manner which leaves no sharp points or edges.

MEASUREMENT AND PAYMENT

The stone infiltration mat and backfill will be paid for separately as “Stone Reservoir”. Geogrid and Geotextile fabric will also be paid for separately.

Cast iron frame and cover are included in this pay item.

The completed work will be paid for at the contract unit price for the following contract item (pay item).

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Infiltration Basin – 48-inch Diameter	Each

The unit price includes all labor, equipment, materials, and documents necessary to install the structure, except as specifically noted herein.

**DETAILED SPECIFICATION
FOR
ITEM #220 – HMA PAVEMENT BASE COURSE
ITEM #221 - HMA PAVEMENT LEVELING
ITEM #222 - HMA PAVEMENT WEARING**

DESCRIPTION

This work shall consist of constructing HMA pavement base, leveling, and surface courses in accordance with Division 5 and Section 501 of the 2012 MDOT Standard Specifications, current supplemental MDOT specifications, and the City Standard Specifications, except as modified herein, and as directed by the Engineer.

MATERIALS AND EQUIPMENT

General

The HMA mixtures to be used for this work shall be as follows:

<u>WORK ITEM</u>	<u>MDOT HMA MIXTURE #</u>
HMA Pavement Wearing (full depth and overlay)	5E1
HMA Pavement Leveling (for full depth)	4E1
HMA Pavement Base Course (full depth)	3E1

Binders for the bituminous mixes shall be PG 58-28 or as directed by the Engineer, and shall meet the requirements specified in Section 904 of the 2012 MDOT Standard Specifications, and any current supplemental MDOT specifications.

Bond coat shall be an emulsified asphalt Type SS-1h and shall meet the requirements specified in Section 904 of the 2012 MDOT Standard Specifications, and any current supplemental MDOT specifications.

The Contractor shall have a 10-foot long straight-edge, backhoe, air-compressor and jackhammer available during all paving operations.

The Aggregate Wear Index (AWI) number for this project is 260. This AWI number applies to all aggregates used in all top course mixtures. Blending aggregates to achieve this AWI requirement is permitted in accordance with current MDOT Standards, and Supplemental Specifications. Reclaimed Asphalt Pavement (RAP) in HMA Mixtures

The use of Reclaimed Asphalt Pavement (RAP) in HMA mixtures shall be in accordance with Section 501.02. A. 2 of the 2012 MDOT Standard Specifications, and the City of Ann Arbor Standard Specifications.

CONSTRUCTION METHODS

All concrete work shall be completed prior to placing HMA mixtures.

The Contractor shall have a 10-foot long straight-edge, backhoe, air-compressor and jackhammer available during all paving operations.

Prior to placing the bond coat, the Contractor shall kill all vegetation (within the area to be paved) by applying an approved weed killer ("Round-Up" by Monsanto, or equal), shall thoroughly clean all joints & cracks in the existing pavement (and any gutter to be overlaid) with compressed air and/or vacuum-type street cleaning equipment to remove all dirt and debris to a depth of at least 1-inch, and shall thoroughly clean the entire surface to be paved, with a Vac-All or similar vacuum-type street cleaning equipment.

MDOT SS-1h bond coat shall be applied at a uniform rate of 0.05 gallons/square yard, on all exposed, existing HMA and concrete surfaces which will come in contact with the new HMA material. The Contractor shall take extra care to avoid covering surfaces which are not to be paved. After September 15, SS-1h bond coat shall not be diluted by more than 25%.

The Contractor shall place HMA wedges using the base, leveling, and wearing mixtures specified herein, as directed by the Engineer, prior to placing the wearing course. Such wedging shall be measured and paid for at the respective unit price of the appropriate HMA Pavement item.

Spot Wedging, Spot Leveling, and Finish Patching shall be performed in accordance with this Detailed Specification and as directed by the Engineer, using the HMA mixture(s) directed by the Engineer. Removal of spot paving, if requested by the Engineer, shall be completed at no cost to the project.

Construction of butt joints, where directed by the Engineer, shall be measured and paid for as "Machine Grading Modified."

HMA wearing and leveling courses shall be placed in lifts of 2-inches or less; base courses shall be placed in lifts of 3- inches or less.

All specified HMA thickness dimensions are compacted-in-place.

The Contractor shall construct the pavement courses to provide the final cross-slopes (crowns) specified by the Engineer.

The Contractor shall construct feather joints, and shall feather the leveling and wearing courses at structures, in drive approaches, and at intersection joints, as directed by the Engineer. Feather joints shall vary the thickness of the asphalt from 0.0-inches to the required full paving thickness (approximately 1½-inches) over a 5-foot to 15-foot distance, or as directed by the Engineer. The Contractor shall rake all large aggregates out of the HMA mixture in feather joints, prior to compaction.

The Contractor shall provide a minimum of two rakers during the placement of all wearing and leveling courses. Further, the Contractor shall provide, when directed by the Engineer, a second "Break-Down" roller in order to achieve the specified asphalt densities.

The Contractor shall provide a minimum of 24-hours' notice to the Engineer prior to paving, and shall obtain a "Permit To Pave" from the Engineer in advance of scheduling paving.

The Contractor and Engineer shall carefully observe the paving operation for signs of faulty mixtures. Points of weakness in the surface shall be removed or corrected by the Contractor, at his/her expense, prior to paving subsequent lifts of HMA material. Such corrective action may include the removal and replacement of thin or contaminated sections of pavement, including sections that are weak or unstable. Once the Contractor or his representative is notified by the Engineer that the material being placed is out of allowable tolerances, or there is a problem with the paving operation, the Contractor shall stop the paving operation at once, and shall not be permitted to continue placing HMA material until again authorized by the Engineer. Substandard work that, in the Engineer's opinion, requires removal and replacement, shall be completed as

follows:

1. Remove and replace leveling and/or wearing course areas mixed with foreign materials and defective areas.
2. Sawcut full depth of existing pavement in perpendicular and parallel directions to adjoining surfaces to ensure a quality and aesthetically pleasing repair.
3. Replacement may need to extend beyond the area of repair. Cut out such areas and fill with fresh, hot mix asphalt.
4. Compact by rolling to specified density and smoothness.
5. Sawcut or route new joint and fill with specified Hot Poured Rubber Joint Sealer product.

During the placement of leveling and wearing courses, the speed of the paving machine(s) shall not exceed 50-feet per minute.

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

Each layer of HMA mixture shall be compacted to between 92 to 96 percent (or as determined acceptable by the Engineer) of the theoretical maximum density, as listed on the approved Job Mix Formula.

MEASUREMENT AND PAYMENT

Measurement of these HMA paving items shall be by the ton, in place. Unused portions of material loads shall be returned to the plant and re-weighed, and the corrected weight slip shall be provided to the Engineer. All weight slips must include the type of mixture (codes are not acceptable), as well as vehicle number, gross weight, tare weight and net weight.

The bond coat is included in the cost of the HMA Pavement Item.

Corrective action shall be enforced as described at Division 5 of the 2012 MDOT Standard Specifications and will be based on the City's or DDA's testing reports.

All costs for furnishing and operating vacuum-type street cleaning equipment, backhoes, jackhammers, and air compressors shall be included in the bid prices for these items of work or in the item of work "General Conditions."

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

PAY ITEM

PAY UNIT

All HMA Pavement Items.....Ton

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

Payment Adjustment In Lieu Of Repair/Replacement

In the case that the work that is installed does not meet the specified quality of materials or installation, the DDA may opt to require the full removal and replacement of the substandard work, or, at their discretion, use the formulas listed below to reduce payment for the work.

A. Pavement Compaction:

1. Pavement

- a. If the daily average in place density is less than 94%, but greater than 93% of the mixture theoretical maximum density (TMD) the paving will be evaluated by the Engineer and Owner and at Owner's discretion, the unit price of that days paving will be reduced to 90% of full payment.
- b. If the daily average in place density is less than 93% but greater than 92% of the mixture TMD the paving will be evaluated by the Engineer and Owner and at Owner's discretion may either be removed or the unit price of that days paving will be reduced to 75% of full payment.
- c. If the daily average in place density is less than 92% of the mixture TMD the paving will be removed and replaced at no cost to Owner.

B. Mix Design Tolerances:

1. If the percent of crushed stone is less than specified, but not more than 10% less, the paving will be evaluated by the Engineer and Owner and at Owner's discretion the unit price of that days paving will be reduced to 90% of full payment.
2. If the percent of crushed stone is more than 10% less than specified, the paving will be evaluated by the Engineer and Owner and at Owner's discretion may be removed or the unit price of that days paving will be reduced to 75% of full payment.
3. If the percent of asphalt binder is 0.30% less than specified, but not more than 0.45% less, the paving will be evaluated by the Engineer and Owner and may either be removed or the unit price of that days paving will be reduced to 90% of full payment.
4. If the percent of asphalt binder is more than 0.45% less, the paving will be evaluated by the Engineer and Owner and may either be removed or the unit price of that days paving will be reduced to 75% of full payment.
5. If the percent of air voids in the mixture is more than specified, but more than 0.5% greater and less than 0.75% greater, the paving will be evaluated by the Engineer and Owner and at Owner's discretion may either be removed or the unit price of that days paving will be reduced to 90% of full payment.
6. If the percent of air voids in the mixture is more than specified, but more than 0.75% more, the paving will be evaluated by the Engineer and Owner and at Owner's discretion may either be removed or the unit price of that days paving will be reduced to 75% of full payment.

**DETAILED SPECIFICATION
FOR
ITEM #223 – TEMPORARY PAVEMENT/PEDESTRIAN ACCESS**

DESCRIPTION

This work shall consist of installing Temporary Pavement/Pedestrian Access as necessary to insure access to entrances to active businesses in the project area. All work shall conform to the 2012 edition of the MDOT Standard Specifications, and the City of Ann Arbor Standard Specifications, except as modified herein, and as directed by the Engineer. All Temporary Aggregate Pavement shall conform to the most recent applicable guidelines and requirements of the Americans with Disability Act (ADA).

MATERIALS

The Temporary Pavement/Pedestrian Access shall be constructed of 21AA Limestone Aggregate mix as specified in the 2012 edition of the MDOT Standard Specifications. The contractor may substitute alternative materials and means of providing temporary access that meets the requirements of the Americans with Disability Act (ADA) for consideration by the Engineer.

CONSTRUCTION METHODS

All areas excavated on any given day which restrict barrier free access to businesses shall be graded, compacted and a temporary walk installed that is opened to pedestrian traffic, that same day, immediately following the excavation. Install the Temporary Pavement/Pedestrian Access as necessary to insure barrier free access, and as directed by the Engineer.

Construction of the pavement shall meet the following conditions:

1. The temporary walks to each business entrance shall connect to existing paved areas suitable for pedestrian access.
2. Compact the subgrade under the location of the temporary walks prior to placement of aggregates.
3. The temporary walks are to be a minimum of 5 feet wide, and shall be a minimum of 4 inches thick of the specified aggregate.
4. The aggregate of each walk area shall be evenly graded and trimmed, and shall be compacted by the use of a vibratory plate compactor or other approved method(s).
5. Compact all temporary walk areas to not less than 98% of its maximum unit weight.
6. In no case shall the longitudinal slope of the temporary walk exceed 5%; cross slope on the walk shall not exceed 2%.
7. Should the temporary walks create areas of ponded water, the Contractor will remove the water with pumps and/or temporary pipes to completely drain the area.
8. The completed work of temporary walk construction shall provide a smooth walking surface, to the satisfaction of the Engineer.
9. Remove the aggregate from the temporary walk areas immediately prior to the installation of the permanent concrete sidewalk. Maintain segregation of the temporary walk aggregate during removal for use in future work. Aggregates used in temporary walk construction may be re-used on the site for other temporary walks or permanent constructed, at the discretion of the Engineer.

MEASUREMENT AND PAYMENT

Measurement shall be by the square yard, in place, for each temporary walk section or area installed.

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

PAY ITEM

PAY UNIT

Temporary Pavement/Pedestrian AccessSquare Yard

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

**DETAILED SPECIFICATION
FOR
ITEM #226 - RECESSING PAVT MRKG, TRANSV**

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 the City of Ann Arbor Permanent Pavement Markings Detailed Specification, the plans, and this detailed specification.

MATERIALS

None specified.

CONSTRUCTION

Install a recess (groove) in accordance with the recessed pavement marking material manufacturer's installation instructions. Ensure all recessing configurations are in accordance with the Michigan Manual of Uniform Traffic Control Devices and the Michigan Department of Transportation Pavement Marking Standards.

1. Grooving Concrete and Hot Mix Asphalt Pavement. If there are no markings on the pavement, paint a temporary tracer line (with no beads) exactly where the permanent markings will be placed. Use these lines as a template for the grooving operation.

Use equipment and methods approved by the manufacturer of the recessed 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, (± 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

Groove Width:	Material width +1 inch, ($\pm 1/8$ inch)
Groove Depth:	As recommended by the manufacturer, (± 5 mils)
Groove Position:	In the exact location where the transverse marking (crosswalk or stop bar) will be placed.

Turning Guide Line Markings

Groove Width: Material width +1 inch, ($\pm 1/8$ inch)
Groove Depth: As recommended by the manufacturer, (± 5 mils)
Groove Position: In the exact location where the turning guide line markings will be placed.

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.

MEASUREMENT AND PAYMENT

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

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Recessing Pavt Mrkg, Transv.....	Square Foot

Recessing Pavt Mrkg, Transv; include placing the temporary tracer line (with no beads), when required, and all work as described in this special provision.

Pavement marking materials, including retroreflective pavement marking required for traffic control, will be paid for separately using the appropriate pay items.

**DETAILED SPECIFICATION
FOR
ITEM #227 - REMOVE CONCRETE SIDEWALK AND DRIVE - ANY THICKNESS
ITEM #228 – ROAD PAVEMENT REMOVE
ITEM #229-1 – BRICK PAVERS, REM, SORT AND SALVAGE, ROADWAY
ITEM #229-2 – BRICK PAVERS, REM, SORT AND SALVAGE, ROADWAY
ITEM #230 - REMOVE CONCRETE CURB OR CURB & GUTTER - ANY TYPE
ITEM #233 – SALVAGE AND RESET STONE CURB**

DESCRIPTION

This work shall consist of removing asphalt and concrete road pavement, concrete curb, gutter, curb and gutter, integral curb, sidewalk (concrete and brick), sidewalk ramps, drive openings and drives, and brick pavers, and salvaging and resetting stone curb, as shown on the Plans, as detailed in the Specifications, and as directed by the Engineer, in accordance with Section 204 of the 2012 MDOT Standard Specifications for Construction, except as specified herein, and as directed by the Engineer.

CONSTRUCTION METHOD

Prior to the start of removals, the Engineer and Contractor together shall field measure all removals.

The Contractor shall perform full-depth saw cutting at removal limits, including those necessary to construct 2-foot wide MDOT Type M drive openings, and including those necessary to provide for the partial removal of existing drive approaches, sidewalks, and curbs as shown on the Plans, as directed by the Engineer, and as marked for removal. The Contractor shall cut steel reinforcement bars as directed by the Engineer at all areas of removal.

The Contractor shall remove all brick pavers where noted on the plans. Reasonable care should be taken to limit damage to brick pavers as they are removed. Brick pavers which are considered sound and dimensionally useful by the Engineer will be stockpiled off site for re-use later in the construction process. Brick paver materials not salvaged will be removed and disposed of by the contractor at no additional expense to the project.

The Contractor shall excavate, cut, remove stumps, remove brush, remove trench drain and clean out, grade, and trim as needed and as directed.

The Contractor shall coordinate with the City Forester prior to the removal of any tree roots.

The Engineer may direct aggregate base materials to be either removed from or added to the job-site, to properly complete the work. Where the Engineer directs the addition of such materials, they shall be paid for as either the Item of Work: “AGGREGATE BASE COURSE-21AA-C.I.P.” or “SAND SUBBASE COURSE, 2NS - C. I. P.” as directed by the Engineer. Where the Engineer directs such materials to be removed, they will not be paid for separately, but shall be included in “Machine Grading, Modified”.

Where existing concrete curb & gutter is to be replaced on a street with a concrete (or brick) base, the Engineer may direct the Contractor to remove a 1-to-2-foot wide, full-depth section of pavement and pavement base from immediately in front of the curb & gutter. As part of this pavement/base removal, the Contractor shall perform additional (double) full-depth saw-cutting along the entire removal limits, and shall take sufficient care so as not to damage and/or disturb any adjacent pavement, pavement

base, and/or any other site feature, all as directed by the Engineer. The removals shall be to a sufficient width and depth to allow for the placement and removal of the curb & gutter formwork. Such removals will be paid for as “Road Pavement, Rem”. After the removal of the formwork, the Contractor shall replace the concrete base to its original thickness and elevation(s), or as directed by the Engineer.

Excavated/removal areas shall be adequately protected with barricades or fencing at all times; paid for as part of “General Conditions”.

Removed or excavated materials which are not incorporated into the work shall become the property of the Contractor and shall be immediately removed and properly disposed of off-site. Removed or excavated materials may not be stockpiled overnight on, or adjacent to, the site.

Use reasonable care in removing all stone curb to protect the condition of the curb and facilitate re-use of the material. Review removed stone curb sections with Engineer and determine which pieces will be salvaged. Remove and dispose of stone curb materials not selected for salvage.

Install salvaged stone curb sections true to line and elevation of the adjacent curb lines. Stone curb to be set within a poured concrete base, approximately 8 inches thick by 12 inches wide.

MEASUREMENT AND PAYMENT

Sidewalk ramp, pre-cast concrete pavers, brick not designated for salvage by the Engineer, and subgrade, and related removals shall be measured and paid for as “Remove Concrete Sidewalk and Driveways - Any Thickness”.

Once the existing brick has been removed from the site (“Brick Pavers, Rem, Sort and Salvage”), the contractor will remove any remaining pavement found below the brick and base material, which shall not be paid for separately.

“Road Pavement, Rem” includes the removal and disposal of all paving to the full depth of the pavement, regardless of the depth encountered. Pavement materials are anticipated to include asphalt, concrete, and brick.

All saw cutting required for removals shall be included in the appropriate item of work, and will not be paid for separately.

Concrete used in the resetting of the salvaged stone curb will be considered incidental to the resetting of the curb.

Salvage and Reset Stone Curb will be paid for basis on the linear foot length of the curb that is reinstalled. Stone curb that is removed and not salvaged will be paid for as Remove Concrete Curb or Curb & Gutter - Any Type.

Concrete removal items shall be field measured and paid for at the Contract Unit Prices for their respective Contract (Pay) Items as follows:

PAY ITEM

PAY UNIT

Remove Concrete Sidewalk & Driveways - Any Thickness	Square Yard
Road Pavement, Rem	Square Yard

Remove Concrete Curb or Curb & Gutter - Any Type	Linear Foot
Brick Pavers, Rem, Sort and Salvage, Roadway	Square Yard
Brick Pavers, Rem, Sort and Salvage, Sidewalk.....	Square Yard
Salvage and Reset Stone Curb	Linear Foot

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

**DETAILED SPECIFICATION
FOR
ITEM #231 – CONCRETE CURB, 6 INCH STRAIGHT
ITEM #234 – CONCRETE CURB & GUTTER - ANY TYPE
ITEM #235 - 8 -INCH CONCRETE RAMP
ITEM #236 - 6-INCH CONCRETE SIDEWALK
ITEM #237 - 8-INCH CONCRETE DRIVE APPROACH, TYPE L OR TYPE M
ITEM #238 CONCRETE PAVEMENT BASE, 8 INCH
ITEM # 239 CONCRETE CROSSWALK, 12 INCH**

DESCRIPTION

This work shall consist of constructing concrete items including concrete curb, gutter, curb and gutter, sidewalks, drive approaches, concrete pavement base and crosswalks MDOT Type M drive openings, steel reinforcement, mechanical anchors and hook bolts, all of any type and/or dimensions, all of either regular, fibermesh reinforced, and/or high-early concrete, in accordance with Sections 601, 602, 603, 801, 802, and 803 of the 2012 MDOT Standard Specifications for Construction, except as specified herein, as shown on the Plans, as shown in this Detailed Specification, and as directed by the Engineer.

The Contractor is responsible to construct all sidewalks, sidewalk ramps, drives, curbs, and all other concrete items within ADAAG compliance. All sidewalks and curb ramps must be constructed in accordance with MDOT Standard Detail R-28-J (version in place at time of the bid letting).

Please note that the project includes concrete paving collars around utility structures in brick paving areas as noted in the Detailed Specification for Brick Pavers.

MATERIALS

Concrete mixtures shall be as follows (or as directed by the Engineer), and concrete materials shall meet the requirements specified in the referenced sections of the MDOT Standard Specifications:

<u>Concrete Item</u>	<u>Concrete Mixture</u>	<u>MDOT Section</u>
Curb or Curb & Gutter	P-NC, P1, 6-sack	601
6” or 8” Sidewalk, Ramp, Pavement or Drive	Fibermesh Reinforced P1, 6 sack Fibermesh Reinforced P-NC	601
12” Crosswalk	Fibermesh Reinforced P1, 6 sack Fibermesh Reinforced P-NC	601

“Fibermesh Reinforced” concrete shall have a polypropylene fibrillated fibers added at a rate of 1.5 pounds per cubic yard. The fibers shall meet the requirements of ASTM C116-89 “Specification for Fiber Reinforced Concrete and Shotcrete” Classification 4.1.3 Type III. The concrete shall be thoroughly mixed for a minimum of 5 minutes after the addition of the fibers to assure uniform distribution throughout the concrete.

CONSTRUCTION METHODS

General

Concrete items, including sidewalk, non-integral curb/gutter, drives, and structure adjustments shall be completed prior to the placement of bituminous asphalt pavement and precast unit pavers.

All subgrade work shall be completed prior to placing concrete items, unless directed or approved by the Engineer.

The subbase shall be trimmed to final elevation before placing curb. Curb shall not be placed on a pedestal or mound.

The Contractor is responsible for any damage to concrete items, including but not limited to vandalism; vehicular, pedestrian and/or miscellaneous structural damage; surface texture damage; and rain damage. Such damaged work will be removed and replaced at no additional cost.

The Contractor shall maintain on-site at all times, a sufficient quantity of adequate materials to protect concrete items. The Engineer may suspend or defer concrete placement if rain protection is not available. The Contractor shall not be entitled to any additional compensation due to work suspension or deferral resulting from a lack of adequate rain protection.

The subbase and adjacent concrete shall be sufficiently wet-down with water prior to placing concrete, to prevent water loss from the new concrete, and to form a better bond between old and new concrete. If a cold-joint becomes necessary, (the) existing concrete surface(s) shall be cleaned with compressed air to expose the aggregate in the concrete.

Where concrete items are placed adjacent to existing pavement that is within areas scheduled for subsequent pavement removal and/or milling, the adjacent pavement area shall, within 48-hours of the removal of concrete formwork, be backfilled with MDOT 21AA, Modified aggregate compacted in place to 95% up to the elevation of the bottom of the adjacent pavement and paid for as "Aggregate Base Course - 21AA - C.I.P."

Prior to compacting backfill in front of curb and gutter, the back of curb shall be backfilled with approved material and compacted by mechanical means to 95%.

Concrete surfaces are to have the finishes noted on the plans. Where no finish is noted, a Light Broom finish perpendicular to the street (for sidewalks), and a Medium Broom finish perpendicular to the street for the Concrete Crosswalks.

Reinforcement

All steel reinforcement, mechanical anchors and hook bolts, all of any type and/or dimensions shall be provided and installed per the Engineer and plans. All costs associated with reinforcement, anchors, and hook bolts is considered incidental to the concrete work.

Sidewalk pavements shall utilize fiber mesh reinforcing, made of 100 percent virgin homopolymer polypropylene graded multifilament fiber. Blend with concrete mix at the rate specified by the manufacturer for the depth of pavements and concrete mix specified.

Contraction Joints in Sidewalk

Contraction joints shall be as located and detailed on the plans. The method of forming joints and spacing shall be approved by the Engineer prior to construction. Joints shall be evenly spaced, forming the pattern indicated on plans, and shall be perpendicular to the building face or curb line unless otherwise directed by the engineer.

Expansion Joints in Sidewalks

¾-inch wide expansion joints shall be placed through concrete sidewalks in line with the extension of all property lines or at the longitudinal ends of each block as directed by Engineer; at all expansion joints in the abutting curb, gutter, and combination curb and gutter, and as directed by the Engineer. Transverse expansion joints shall be placed through the sidewalks at uniform intervals of not more than 300- feet, or at a minimum, the center of each block.

½-inch wide expansion joints shall be placed between the sidewalk and back of abutting curb or gutter, at the juncture of two sidewalks, between the sidewalk and buildings and other rigid structures, and as directed by the Engineer.

Expansion Joints in Curb and Gutter

¾-inch wide expansion joints shall be placed at all street returns, at all expansion joints in an abutting pavement, at each side of all driveways (at radius points), elsewhere at 300-foot maximum intervals, and as directed by the Engineer.

Expansion joint material shall extend to the full depth of the joint. After installation, the top shall not be above the concrete nor be more than ½-inch below it. No reinforcing steel shall extend through expansion joints.

Plane of Weakness Joints in Curb and Gutter

Intermediate plane of weakness joints shall be placed to divide the structure into uniform sections, normally 10-feet in length, with a minimum being 8-feet in length, and shall be placed opposite all plane of weakness joints in the abutting concrete base course.

Plane of weakness joints shall be formed by narrow divider plates, which shall extend 3-inches into the exposed surfaces of the curb or curb and gutter. Plates shall be notched, if necessary, to permit the steel reinforcement to be continuous through the joint.

MEASUREMENT AND PAYMENT

The work of furnishing and installing mechanical anchors and hook bolts will be considered incidental to the work item.

A deduction in length for catch basins and inlet castings will be made to measurements of Curb and Gutter.

Curb and gutter (including "Curb and Gutter, Thickened Pan"), and MDOT type M openings, shall be paid as "Concrete Curb & Gutter - ALL TYPES", and measured at the center of the curb and gutter cross section.

All miscellaneous hand work is considered included in the pay items of work and shall not be paid for separately.

Payment for saw cutting for Type M openings and for partial removal of existing drives shall be included in the price for the item of work, "Remove Concrete Sidewalk & Driveways - Any Thickness", and will not be paid for separately.

Completed work as measured for these items of work will be paid for at Contract Unit Price for the following

Contract (Pay) Items:

<u>PAY ITEMS</u>	<u>PAY UNIT</u>
Concrete Curb, 6 Inch Straight.....	Linear Foot
Concrete Curb and Gutter – Any Type	Linear Foot
8-Inch Concrete Ramp.....	Square Foot
6-Inch Concrete Sidewalk	Square Foot
8-Inch Concrete Drive Approach (Type L or Type M)	Square Foot
Concrete Pavement Base, 8 inch (under pavers).....	Square Foot
Concrete Crosswalk, 12 Inch	Square Foot

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

**DETAILED SPECIFICATION
FOR
ITEM# 232 – CONCRETE PLANTER CURB
ITEM #245 – CONCRETE SEAT WALL
ITEM #246 - CONCRETE UNIT RETAINING WALL, REM, SALVAGE, AND RE-INSTALL**

DESCRIPTION

Section includes cast-in-place architectural concrete including form facings, reinforcement accessories, concrete materials, concrete mixture design, placement procedures, and finishes. This work shall be completed as shown on the Plans, as detailed in the Specifications, and as directed by the Engineer, in accordance with City of Ann Arbor Standard Specifications and the 2012 MDOT Standard Specifications for Construction, except as specified herein, and as directed by the Engineer.

This section also includes the removal, salvage and reinstallation of a concrete unit retaining wall currently located in the city street right-of-way.

A. Definitions

Cast-in-Place Architectural Concrete: Formed concrete that is exposed to view on surfaces of completed Concrete Seat Wall or Concrete Planter Curb and that requires concrete materials, formwork, placement, or finishes to obtain specified architectural appearance.

Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

Design Reference Sample: Sample designated by Engineer in the Contract Documents that reflects acceptable surface quality and appearance of cast-in-place architectural concrete.

B. Preinstallation Meetings

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place architectural concrete to attend, including the following:

Contractor's superintendent.

PART 1 - Independent testing agency responsible for concrete design mixtures.

PART 2 - Ready-mix concrete manufacturer.

PART 3 - Cast-in-place architectural concrete subcontractor.

2. Review concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction joints, forms and form-removal limitations, reinforcement accessory installation, concrete repair procedures, decorative lighting, and protection of cast-in-place architectural concrete.

C. Action Submittals

Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments. Indicate amounts of mixing water to be withheld for later addition at Project site.

Formwork Shop Drawings: Show formwork construction including form-facing joints, rustications, construction and contraction joints, form joint-sealant details, form tie locations and patterns, inserts and embedments, cutouts, cleanout panels, and other items that visually affect cast-in-place architectural concrete

Placement Schedule: Submit concrete placement schedule before start of placement operations. Include locations of all joints including construction joints.

Samples: For each of the following materials:

- 1) Form-facing panel.
- 2) Form ties.
- 3) Form liners.
- 4) Coarse- and fine-aggregate gradations.
- 5) Chamfers and rustications.

D. Informational Submittals

Material Certificates: For each of the following:

- 1) Cementitious materials.
- 2) Admixtures.
- 3) Form materials and form-release agents.
- 4) Repair materials.

Material Test Reports: For the all aggregates, by a qualified testing agency

E. Quality Assurance

Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

Source Limitations for Cast-in-Place Architectural Concrete: Obtain each color, size, type, and variety of concrete material and concrete mixture from single manufacturer with resources to provide cast-in-place architectural concrete of consistent quality in appearance and physical properties.

ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

- 1) ACI 301, "Specification for Structural Concrete
- 2) ACI 303.1, "Specification for Cast-in-Place Architectural Concrete."

Concrete Testing Service: The Owner will engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures. The Contractor may, at their own expense, elect to perform materials testing.

Mockups: Before casting architectural concrete, the Engineer may require the contractor to build mockups to demonstrate typical joints, surface finish, texture, tolerances, and standard of workmanship. Obtain Engineer's approval of mockups before casting architectural concrete. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

MATERIALS

A. Form-Facing Materials

General: Comply with Division 03 Section "Cast-in-Place Concrete" for formwork and other form-facing material requirements.

Chamfer Strips: Metal, rigid plastic, elastomeric rubber, or dressed wood, 3/4 by 3/4 inch (19 by 19 mm), minimum; nonstaining; in longest practicable lengths.

Form Joint Tape: Compressible foam tape; pressure sensitive; AAMA 800, "Specification 810.1, Expanded Cellular Glazing Tape"; minimum 1/4 inch (6 mm) thick.

Form Joint Sealant: Elastomeric sealant complying with ASTM C 920, Type M or Type S, Grade NS, that adheres to form joint substrates.

Sealer: Penetrating, clear, polyurethane wood form sealer formulated to reduce absorption of bleed water and prevent migration of set-retarding chemicals from wood.

Form-Release Agent: Commercially formulated, colorless form-release agent that will not bond with, stain, or adversely affect architectural concrete surfaces and will not impair subsequent treatments of those surfaces. Formulate form-release agent with rust inhibitor for steel form-facing materials.

Surface Retarder: Chemical liquid set retarder, for application on form-facing materials, capable of temporarily delaying final hardening of newly placed concrete surface to depth of reveal specified.

Form Ties: Factory-fabricated, glass-fiber-reinforced plastic ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal. Provide in the structural design of the forms the location of ties within the joints such that patches of tie holes will be in joints. Furnish internally disconnecting ties that will leave no metal closer than 1-1/2 inches (38 mm) from the architectural concrete surface.

B. Concrete Materials

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

Portland Cement: ASTM C 150, Type I. The provider may supplement Portland Cement with the following:

- 1) Fly Ash: ASTM C 618, Maximum 25% of total cementitious material for Class C and 20% of total cementitious material for Class F. Minimum amount of fly ash, when used 15% of total cementitious material.
- 2) Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or Grade 120. Maximum

- 50 percent of total cementitious material.
- 3) Silica Fume: ASTM C 1240, amorphous silica. Maximum 7.5 percent of total cementitious material.
 - 4) Combined pozzolanic mineral admixture or fly ash, and silica fume: 30% by total cementitious material with fly ash or pozzolans not exceeding 25%.
 - 5) Combined fly ash or other pozzolans, ground granulated blast-furnace slag and silica fume: 50% of total cementitious material.

Use cementitious material that is of same brand and type and from same plant as used in the concrete mix design submittal.

B. Normal-Weight Aggregates: To match sidewalk aggregate source, ASTM C 33

C. Normal-Weight Fine Aggregate: To match sidewalk aggregate source, ASTM C 33

D. Water: Potable, complying with ASTM C 94/C 94M except free of wash water from mixer washout operations.

C. Admixtures

Air-Entraining Admixture: ASTM C 260.

Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

- 1) Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
- 2) Retarding Admixture: ASTM C 494/C 494M, Type B.
- 3) Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
- 4) High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
- 5) High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
- 6) Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

D. Curing Materials

Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

E. Repair Materials

Bonding Agent: ASTM C 1059/C 1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

Epoxy Bonding Adhesive: ASTM C 881/C 881M, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to

suit requirements. Types I and II, non-load bearing for bonding hardened or freshly mixed concrete to hardened concrete.

F. Concrete Mixtures, General

Prepare design mixtures for each type and strength of cast-in-place architectural concrete proportioned on basis of laboratory trial mixture or field test data, or both, according to ACI 301.

Use a qualified independent testing agency for preparing and reporting proposed design mixtures based on laboratory trial mixtures.

Proportion concrete mixtures as follows:

- 1) Compressive Strength (28 Days): 4000 psi (27.6 MPa) (20.7 MPa).
- 2) Maximum Water-Cementitious Materials Ratio: 0.46.
- 3) Slump Limit: 4 inches (100 mm), plus or minus 1 inch (25 mm).
- 4) Air Content: 6 percent, plus or minus 1.5 percent at point of delivery.

Admixtures: Use admixtures according to manufacturer's written instructions.

G. Concrete Mixing

Ready-Mixed Architectural Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and furnish batch ticket information.

- 1) Clean equipment used to mix and deliver cast-in-place architectural concrete to prevent contamination from other concrete.
- 2) When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

H. Skate Board Deterrent

Skate Board Deterrents are to be installed on the Concrete Seat Wall where noted on the plans. The deterrent shall be manufactured by Intelliccept of San Diego, CA, model "Gorilla 135", an extruded aluminum single piece deterrent specifically made to deter skate board use along masonry walls with a 1/2 inch chamfered edge. Part dimensions to be 1.125 inches wide, 8 inches long, and 1.125 inches high. Deterrents are to be hard tumbled and finished as "Hard Anodized" (Type III anodizing process).

The specified model is distributed by Park Warehouse, (phone number is 888-321-5334).

CONSTRUCTION METHODS

A. Formwork (applies to Concrete Planter Curb and Concrete Seatwall)

Limit deflection of form-facing panels to not exceed ACI 303.1 requirements.

In addition to ACI 303.1 limits on form-facing panel deflection, limit cast-in-place architectural concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

- 1) Class B, 1/4 inch

Fabricate forms to result in cast-in-place architectural concrete that complies with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

Forms for curved walls are to be created in a continuous curve, and not out of individual straight form panels.

Contractor is to install conduits and fittings relate to the LED strip lights while forming the walls. Coordinate with electrical trades as necessary.

Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-in-place surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood rustications, keyways, reglets, recesses, and the like, for easy removal.

Seal form joints and penetrations at form ties with form joint tape or form joint sealant to prevent cement paste leakage.

Do not use rust-stained steel form-facing material.

Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

Chamfer exterior corners and edges of cast-in-place architectural concrete, as indicated on the drawings.

Coat contact surfaces of wood rustications and chamfer strips with sealer before placing reinforcement, anchoring devices, and embedded items.

Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

Coat contact surfaces of forms with surface retarder, according to manufacturer's written instructions, before placing reinforcement.

Place form liners accurately to provide finished surface texture indicated. Provide solid backing and attach securely to prevent deflection and maintain stability of liners during concreting. Prevent form

liners from sagging and stretching in hot weather. Seal joints of form liners and form liner accessories to prevent mortar leaks. Coat form liner with form-release agent.

B. Removing and Reusing Forms

Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.

Schedule form removal to maintain surface appearance that matches approved.

Cut off and grind glass-fiber-reinforced plastic form ties flush with surface of concrete.

Clean and repair surfaces of forms to be reused in the Work. Do not use split, frayed, delaminated, or otherwise damaged form-facing material. Apply new form-release agent.

When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for cast-in-place architectural concrete surfaces.

C. Joints

Construction Joints: Construction joints are not allowed on the poured walls.

Contraction Joints: Form weakened-plane contraction joints true to line with faces perpendicular to surface plane of cast-in-place architectural concrete so strength and appearance of concrete are not impaired, at locations indicated or as approved by Engineer.

D. Concrete Placement

Before placing concrete, verify that installation of formwork, form-release agent, reinforcement, and embedded items is complete and that required inspections have been performed.

Do not add water to concrete during delivery, at Project site, or during placement unless approved by Engineer.

Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

Deposit concrete continuously. Deposit concrete to avoid segregation.

- 1) Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
- 2) Consolidate placed concrete with mechanical vibrating equipment according to ACI 303.1.
- 3) Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6

inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. Do not permit vibrators to contact forms.

Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

- 1) When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
- 2) Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
- 3) Do not use calcium chloride, salt, or other materials containing antifreeze agents.
- 4) Do not use chemical accelerators unless otherwise specified and approved in design mixtures.

Hot-Weather Placement: Comply with ACI 301 and as follows:

- 1) Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
- 2) Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

E. Finishes, General

Architectural Concrete Finish: Match Engineer's design reference sample, identified and described as indicated, to satisfaction of Engineer.

Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces.

Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

Maintain uniformity of special finishes over construction joints unless otherwise indicated.

F. As-Cast Formed Finishes

Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

G. Concrete Protecting and Curing

General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with ACI 301 for hot-weather protection during curing.

Begin curing cast-in-place architectural concrete immediately after removing forms from concrete. Cure according to ACI 308.1, by one or a combination of the following methods that will not mottle, discolor, or stain concrete:

Moisture Curing: Keep exposed surfaces of cast-in-place architectural concrete continuously moist for no fewer than seven days with the following materials:

- 1) Continuous water-fog spray.
- 2) Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
- 3) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for no fewer than seven days. Immediately repair any holes or tears during curing period; use cover material and waterproof tape.
- 4) Curing Compound: Mist concrete surfaces with water. Apply curing compound uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

H. Repairs, Protection, and Cleaning

Repair and cure damaged finished surfaces of cast-in-place architectural concrete when approved by Engineer. Match repairs to color, texture, and uniformity of surrounding surfaces and to repairs on approved mockups.

Remove and replace cast-in-place architectural concrete that cannot be repaired and cured to Engineer's approval.

Protect corners, edges, and surfaces of cast-in-place architectural concrete from damage; use guards and barricades.

Protect cast-in-place architectural concrete from staining, laitance, and contamination during remainder of construction period.

Clean cast-in-place architectural concrete surfaces after finish treatment to remove stains, markings, dust, and debris.

Wash and rinse surfaces according to concrete finish applicator's written instructions. Protect other Work from staining or damage due to cleaning operations.

Do not use cleaning materials or processes that could change the appearance of cast-in-place architectural concrete finishes.

I. Skate Board Deterrents

Install the Skate Board Deterrents on the Concrete Seat Wall where shown on the plans. The deterrents shall be installed pursuant to the manufacturer's recommendations, including the use of concealed pin anchors and epoxy suited for use in the local climate.

J. Concrete Unit Retaining Wall, Rem, Salvage, and Re-install

Remove concrete retaining wall units using reasonable care to preserve the units in an unblemished and reusable condition.

If the Engineer determines that the existing wall units should not be salvaged, the Contractor shall dispose of the wall units at no additional expense to the project. The Engineer will select a replacement concrete retaining wall unit and reimburse the contractor for the direct costs associated with obtaining the wall units. Other materials and installation of any new wall units would be included in the pay item “Concrete Unit Retaining Wall, Rem, Salvage, and Re-install”.

The Engineer will determine the final location of the retaining wall. Excavate to grades and install a 12 inch thick stone pad, 18 inches in width, using MDOT 21AA Aggregate, compacted in place to 95% density. Install wall units to match previous pattern and layout.

Bond units together with a polyurethane adhesive specifically manufactured for concrete wall units.

Jointing in the base course and cap should not line up, but be laid in a running bond fashion.

Place geotextile filter fabric behind the wall.

Backfill wall with MDOT Class II Sand, compacted in 8 inch lifts. Restore a minimum of 6 inches of topsoil at tops part of wall.

MEASUREMENT AND PAYMENT

This work will be measured and paid using the following contract item (pay item):

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Concrete Planter Curb	Linear Foot
Concrete Seat Wall.....	Linear Foot
Concrete Unit Retaining Wall, Rem, Salvage, and Re-install	Linear Foot

Payment for these items includes all materials, labor and equipment necessary to complete the work as described, including, but not limited to, excavation, base prep, stone base, forming and reinforcing wall and planter curbs, installing and backfilling concrete retaining wall units, pouring and finishing walls and planter curbs, furnishing of skate board use deterrents, and backfilling.

Concrete Seat Wall, Concrete Planter Curb, and Concrete Unit Retaining Wall, Rem, Salvage, and Re-install will be measure in place at the center line of the wall.

**DETAILED SPECIFICATION
FOR
ITEM #240 - DETECTABLE WARNING, CAST IN PLACE**

DESCRIPTION

This work shall consist of furnishing and installing cast in place detectable warning units in compliance to the Americans with Disability Act (ADA). All work shall be in accordance with MDOT Standard Detail R-28 (version in place at time of the bid letting).

MATERIALS AND CONSTRUCTION METHODS

The detectable warning tiles shall be ceramic cement or composite polymer concrete (CRC), colored as Federal Number 22144 (frequently referred to as "Colonial Red" or "Brick Red"). The detectable warning tiles shall meet the following dimensions and tolerances:

1. Dimensions: Cast In Place Detectable/tactile Warning Surface Tiles shall be held within the following dimensions and tolerances:

Length: 24"

Width: The full width of the approaching walk (60" for typical sidewalk), or as indicated on plans.

Depth: 1.375 (1-3/8") (+/-) 5% max.

Face Thickness: 0.1875 (3/16") (+/-) 5% max. Warpage of Edge: 0.5% max. Embedment Flange Spacing: shall be no greater than 3.1"

2. Water Absorption of Tile when tested by ASTM D 570-98 not to exceed 0.05%.
3. Slip Resistance of Tile when tested by ASTM C 1028-96 the combined Wet and Dry Static Co-Efficients of Friction not to be less than 0.80 on top of domes and field area.
4. Compressive Strength of Tile when tested by ASTM D 695-02a not to be less than 28,000 psi.
5. Tensile Strength of Tile when tested by ASTM D 638-03 not to be less than 19,000 psi.
6. Flexural Strength of Tile when tested by ASTM D 790-03 not to be less than 25,000 psi.
7. Chemical Stain Resistance of Tile when tested by ASTM D 543-95 (re approved 2001) to withstand without discoloration or staining - 10% hydrochloric acid, urine, saturated calcium chloride, black stamp pad ink, chewing gum, red aerosol paint, 10% ammonium hydroxide, 1% soap solution, turpentine, Urea 5%, diesel fuel and motor oil.
8. Abrasive Wear of Tile when tested by BYK - Gardner Tester ASTM D 2486-00 with reciprocating linear motion of $37 \pm$ cycles per minute over a 10" travel. The abrasive medium, a 40 grit Norton Metallite sand paper, to be fixed and leveled to a holder. The combined mass of the sled, weight and wood block is to be 3.2 lb. Average wear depth shall not exceed 0.060 after 1000 abrasion cycles when measured on the top surface of the dome representing the average of three measurement locations per sample.
9. Resistance to Wear of Unglazed Ceramic Tile by Taber Abrasion per ASTM C501-84 (re approved 2002) shall not be less than 500.
10. Fire Resistance of Tile when tested to ASTM E 84-05 flame spread shall be less than 15.
11. Gardner Impact to Geometry "GE" of the standard when tested by ASTM D 5420-04 to have a mean failure energy expressed as a function of specimen thickness of not less than 550 in. Ibf/in. A failure is noted when a crack is visible on either surface or when any brittle splitting is observed on the bottom plaque in the specimen.
12. Accelerated Weathering of Tile when tested by ASTM G 155-05a for 3000 hours shall exhibit

the following result $-E < 4.5$, as well as no deterioration, fading or chalking of surface.

- 13. Accelerated Aging and Freeze Thaw Test of Tile and Adhesive System when tested to ASTM D 1037-99 shall show no evidence of cracking, delamination, warpage, checking, blistering, color change, loosening of tiles or other detrimental defects.
- 14. Salt and Spray Performance of Tile when tested to ASTM B 117-03 not to show any deterioration or other defects after 200 hours of exposure.
- 15. AASHTO HB-17 single wheel HS20-44 loading "Standard Specifications for Highways and Bridges". The Cast In Place Tile shall be mounted on a concrete platform with a 1/2" airspace at the underside of the tile top plate then subjected to the specified maximum load of 10,400 lbs., corresponding to an 8000 lb individual wheel load and a 30% impact factor. The tile shall exhibit no visible damage at the maximum load of 10,400 lbs.
- 16. Embedment flange spacing shall be no greater than 3.1" center to center spacing as illustrated on the product Cast In Place drawing.

CONSTRUCTION METHODS

The contractor shall follow manufacturer specifications for installation, except where they conflict with MDOT Standard Detail R-28-J (version in place at time of the bid letting).

MEASUREMENT AND PAYMENT

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

PAY ITEM

PAY UNIT

Detectable Warnings, Cast In Place Square Foot

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

**DETAILED SPECIFICATION
FOR
ITEM # 241 BRICK PAVERS, NEW
ITEM #242 BRICK, INSTALL SALVAGED BRICK**

DESCRIPTION AND MATERIALS

This work includes supplying and installing pre-cast concrete pavers laid with hand-tight joints over a fine aggregate bedding, to be placed on a separately paid for concrete slab. All work must be conducted in accordance with the plans and specifications, the 2012 MDOT Standard Specification for Construction, and the City Standard Specifications.

Related Documents

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, City Standard Specification, and MDOT 2012 Standard Specifications for Construction (as well as applicable Special Provisions as referenced herein) apply to this Section

Submittals

- A. Samples: Submit one sample of each shape and color of paver for approval. Where necessary submit additional pavers showing extreme range of color and texture for specified items.
- B. Certification Reports: Submit product certification materials for each type of new brick pavers, demonstrating compliance for the following:
 - 1. Compressive Strength
 - 2. Flexural Strength
 - 3. Absorption
 - 4. Freeze/Thaw Resistance

Quality Control/Quality Assurance

- A. Employ one installing entity to be responsible for the finished pavement surface, including installation of the paver containment, setting bed, joint filler and setting of unit pavers, who has, in the past three years, installed at least three projects of this size or larger.

- B. Job Mock-Up:

Construct a mock-up sample of the brick paving for review and approval by the Engineer. The mock-up will be 40 square feet minimum in size, utilizing the pattern and joints required for the project. Approximately half of the mock-up will be made of new brick, and the other half of salvaged brick. The Mock-up may be two separate areas, 20 square foot in size each. Consider the selected mock-up a minimum standard of workmanship when accepted, to be matched or bettered throughout the Project. The mock-up may be constructed as part of the Project and, if approved, will be accepted as part of the Work. However, should the Mock-up fail to meet the Engineer's approval, remove and reconstruct it until approved.

- C. Protect the Work completed under this section, adjacent work and materials against damage during progress of the Work until complete.

Delivery, Storage and Handling

- A. Deliver materials to the job site in a timely manner so as not to delay progress of the Work.
- B. Deliver materials to the job site in their original unopened containers bearing labels clearly identifying the manufacturer's name.
- C. Suitably store materials, if necessary, in a location agreeable to the Owner and Contractor.
- D. Store the materials under cover, clear of the ground, and protected from the weather and damage during storage.

Materials

- A. Source Limitations: Obtain each type of unit paver, joint material, and setting material from single source with resources to provide materials and products of consistent quality in appearance and physical properties.
- B. Fine Aggregate Bed. Sand shall be well graded, washed sharp sand conforming to ASTM c33, and meeting the following sieve analysis gradations:

<u>Sieve</u>	<u>Percent Passing</u>
3/8 inch	100
No. 8	80-100
No. 16	50-85
No. 30	25-60
No. 50	20-30
No. 200	0-5

Use of masonry sand will not be permitted.

- C. Jointing Sand. Clean, fine, sharp sand, in compliance with ASTM C144 (gradation for 1/8 inch joints). The jointing sand shall be free of organics and soluble salts or other contaminants likely to cause efflorescence. The jointing sand shall be in compliance with the following grading limits:

<u>Sieve</u>	<u>Percent Passing</u>
No. 8	95-100
No. 16	70-100
No. 30	40-75
No. 50	10-35

- D. New Brick Pavers: Heavy vehicular paving brick; ASTM C 1272, Grade SW, Type F, Application PS. Brick shall be free of cracks or other imperfections detracting from the appearance of a designated sample when viewed from a distance of 20 feet for Application PS, and meeting the following conditions:
 - 1. Manufacturers: Subject to compliance with requirements, provide products manufactured by Ragland Clay Products. Local product representative is Kim Mehl (phone #248-224-9628)
 - 2. Thickness: 4 inches (nominal)
 - 3. Face Size: 3 inches by 9 inches (nominal)

4. Color: Antique Red
5. Efflorescence: Brick shall be rated "not effloresced" when tested according to ASTM C 67.

Contractor is to provide the specified new brick paver, or an equal product approved by the Engineer.

- E. Salvaged Brick Pavers: Salvaged Brick Pavers shall be installed using the same materials and methods as the new brick pavers.
- F. Paving Jointing Mortar: Two component epoxy resin paving jointing mortar for light to medium traffic loads
 1. Manufacturers: Subject to compliance with requirements, provide paving jointing mortar by Romex® Materials LCC, 10650 Culebra Rd, Suite#104-553, San Antonio, TX 78251-4806. www.romexusa.com. 1-844-880-5065.
 2. Paving jointing mortar to be Rompox®-D1 by Romex®
 3. Color: stone grey

Contractor is to provide the specified paving jointing mortar, or an equal product approved by the Engineer.

CONSTRUCTION METHODS

- A. Sand Setting Bed
 1. The sand shall be of uniform moisture content when screeded and shall be **protected against rain when stockpiled on site prior to screeding.** For installation, the moisture content shall be in the range of 4 to 8 percent.
 2. Spreading: The bedding sand shall be spread loose in a uniform layer to give a depth after compaction of the paving units of a maximum 3/4 inch thickness and as required to achieve designed grades.
- B. Screeding of Paver Setting Bed:
 1. The spread sand shall be carefully maintained in a loose condition and protected against pre-compaction by traffic or rain both prior to and following screeding. Sand shall be lightly screeded in a loose condition to predetermined depth. Under no circumstances shall the sand be screeded in advance of the laying face to an extent to which paving will not be completed on that day. Any screeded sand which is pre-compacted prior to laying of paving unit shall be brought back to profile in a loose condition. Neither pedestrian nor vehicular traffic shall be permitted on the screeded sand.
 2. The Contractor shall screed the bedding sand using either an approved mechanical spreader or by the use of screed guides and boards.
- C. Utility Collars
 1. All water and gas valves, curb boxes and related at grade obstructions located in the brick paver areas are to have a cast in place concrete collar installed integral to the slab of concrete below the pavers, which is square or rectangular in shape, at least 4 inches wider than the perimeter of the utility cover in all directions. Where feasible, the utility collar should be dimensioned to minimize the cutting of pavers and the use of cut slivers of pavers. Review collar and utility conditions with Engineer before completion of sidewalk formwork.
 2. Utility collars shall be poured with the concrete road and walk supporting the pavers, and will be paid for as part of the concrete paving pay items.

D. Placing Brick Pavers

1. Pavers chips, cracks, voids, discolorations or other defects shall not be installed.
2. Pattern: The pavers shall be laid in the pattern as shown on drawings
3. Color Blending: Paving units shall be installed from a minimum of three bundles simultaneously drawing the paver vertically rather than horizontally.
4. Joints: Joint spacing shall be consistent and of approximately 1/8 inch unless noted otherwise. The spacing must be a minimum of 1/8 inch to accept the paving jointing mortar. This spacing must also be provided for the first row abutting the edge restraint and/or concrete sidewalk.
5. Alignment: String lines or chalk lines on bedding sand should be used to hold all pattern lines true.

E. Cutting of Pavers

1. Contractor shall make all efforts to use full bricks to the maximum extent possible. Where cutting of brick is required to achieve the desired pattern, brick shall be cut to leave a clean edge to the traffic surface using a mechanical hydraulic, or guillotine cutter or masonry saw.
2. Discontinuities in patterns will not be permitted. Lay out pavers in all areas so as to eliminate slivers at edges.
3. Carefully place the pavers by hand in straight courses with hand-tight joints and uniform top surface. Maintain good alignment and provide the pattern indicated.
4. Protect newly laid pavers at all times by panels of plywood, on which the installer stands, which can be advanced as work progresses. However, keep the plywood protection in areas which will be subjected to continued movement of materials and equipment. Take these precautions to avoid depressions and protect paver alignment.
5. If additional leveling of the pavers is required, and before sweeping in joint filler, roll with a power roller after sufficient heat has built up in the surface from several days of hot weather.
6. Inspection of Installed Pavers: After sweeping and prior to compaction, the paved area shall be inspected by the Owner and the Engineer to ensure satisfactory color blending. Areas deemed poorly blended shall be removed and re-installed in order to achieve satisfactory color distribution.

F. Compaction of Pavers

1. After inspection of the pavers, they shall be compacted to achieve consolidation of the sand bedding and brought to design levels and profiles by not less than three passes of a suitable plate compactor.
2. Compaction shall be accomplished by the use of a plate compactor capable of a minimum of 5,000 pound compaction force.
3. Initial compaction should proceed as closely as possible following installation of the paving units and prior to acceptance of any traffic or application of jointing sand.
4. Care shall be taken not to damage pavers or surface finish during compaction.

G. Initial Joint Treatment for Pavers

1. Jointing sand shall be spread over the pavement after initial compaction has been completed. The jointing sand shall be spread as soon as is practical after initial compaction and prior to the termination of work on that day. The Contractor shall not use wet sand.
2. The jointing sand shall be broomed to fill the joints. Excess sand shall then be removed from the pavement surface and the pavers shall be compacted again to settle the jointing sand.
3. Repeat this operation a minimum of two times.

H. Final Compaction for Pavers

1. After jointing sand has been installed and the pavement surface swept clean, final compaction

- shall be accomplished by not less than two passes of the plate compactor.
2. Final compaction should proceed as closely as possible following installation of jointing sand and prior to the acceptance of any traffic.
- I. Proof Rolling
1. Proof roll the completed installation with pneumatic tire equipment which replicates anticipated service traffic. Subject each individual paver to at least one passage of load.
 2. Equipment and procedures are subject to approval by the Owner and Engineer and proof rolling will be observed and recorded by the Engineer.
 3. Remove and replace units cracked or otherwise damaged by proof rolling, including inspection and repair of setting bed.
- J. Paving jointing mortar
1. Preparation: Clean out joints to a depth of at least 1 3/16" (3 cm). The surface to be joint-fixed should be cleaned of all impurities before work commences. Adjoining surfaces that are not to be joint-fixed are taped off.
 2. Pre-wet: Pre-wet the surface. Porous surfaces as well as higher surface temperatures, require more intense pre-wetting.
 3. Mix: Pour the 55.1 lbs (25 kg) filler components into a powered mixing tub and start the mixing process. While mixing, slowly add the separately packaged components completely into the mixture. After mixing for 3 minutes add water according to the product package and continue mixing well for at least 3 minutes.
 4. Application: Apply the mixed paving jointing mortar onto the well moistened surface and work it carefully into the joints using a squeegee/rubber slider. The mortar is poured out at three or four spots within the jointing area in order to make best use of the fluidity of the paving jointing mortar. Application time at 68 °F (20 °C) is approx. 20 – 30 minutes.
 5. Final cleaning: After approx. 10 – 15 minutes the excess mortar on the surface of the stones can be swept off carefully with a large, coarse broom. Then use a soft, hair broom to do a final cleaning until all residual mortar has been removed from the surface. The correct moment for sweeping, is when white smears no longer form on the stone surface during sweeping. Sweeping should be done diagonally to the joint. Do not re-use swept off material.
 6. Protection: The freshly jointed surface needs to be protected against rain for the next 12 – 24 hours. The rain protection layer must not be laid directly onto the paved surface this is to ensure sufficient air circulation. Safe rain protection is afforded by the specially developed ROMEX® protective surface mats that can be simply laid on the surface.
- K. Allowable Tolerance
1. Finished surface of pavement smooth, even, and true to the lines, grades and cross section indicated. Maximum deviation when tested with a 10-foot straight-edge parallel to the centerline of the surfaced area: 1/4 inch in 10 feet.
 2. Maximum offset from flush from paver to paver to a fixed flush edge: 1/16 inch.
 3. Slope finished walk for drainage without any ponded water on the finished surface.
- L. Repair, Cleaning and Protection.
1. Clean paver surface of all debris, dirt, and sand.
 2. Remove and replace pavers which are chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in the same manner as original units, with same joint treatment to eliminate evidence of replacement.
 3. Provide final protection of paver in a manner acceptable to the installer, which ensures paver work being without damage or deterioration at the time of substantial completion.

4. Warranty. Finished area shall be free of bumps or depressions, evenly graded to levels shown, and shall be guaranteed against defects of materials and workmanship for a period of two years after substantial completion.

MEASUREMENT AND PAYMENT

This work will be measured and paid using the following contract item (pay item):

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Brick Pavers, New	Square Foot
Brick, Install Salvaged Brick	Square Foot

Brick Pavers, New and Brick, Install Salvaged Brick will be measured and paid by the area of unit paver pavement in place. The work includes the sand setting bed, jointing sand, and all incidental measures required to complete the work, including the utility collars described herein. The concrete base slab and utility collars will be paid for separately.

**DETAILED SPECIFICATION
FOR
ITEM #249 - HYDRANT ASSEMBLY ABANDONMENT**

DESCRIPTION

This work shall include abandoning and removing fire hydrant assemblies, valves, and water pipe as required by the Plans. All work shall be done in accordance with the City of Ann Arbor Public Services Department Standard Specifications, and as directed by the Engineer.

CONSTRUCTION METHODS

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

Contractor is to fully remove fire hydrant, related valves, thrust blocks, and water line (to the extents indicated on the plans). Cap old connection to water main as directed by Engineer.

In locations as shown on the Plans or where abandoned fire hydrants are within 2.5 feet of the proposed subgrade the resulting hole or trench shall be backfilled with Class II Sand, in maximum lifts of 12 inches, and be compacted to 95% of its modified proctor value, if located within the influence paved surfaces or structures. Otherwise, backfill shall be Engineer approved native material, compacted to 90% of its modified proctor value, in lifts of 12 inches or less, unless otherwise noted on the plans.

Abandoned (salvaged) fire hydrant assemblies shall be delivered to the City of Ann Arbor Field Services Unit at the Wheeler Service Center located at 4251 Stone School Road. As directed by the Engineer and within two days of their removal, the Contractor shall either deliver the existing structure covers and valve boxes to the City's yard at 4251 Stone School Road or dispose of them at his/her sole expense.

MEASUREMENT AND PAYMENT

The unit price for the pay item "Fire Hydrant Assembly Abandonment," includes all labor, material and equipment costs associated with the complete removal of the existing fire hydrant assembly, as specified herein, including but not limited to, excavation MDOT CL II Backfill and compaction; pipe cutting and removal; thrust block removal; pipe plug; thrust block; salvaging of fire hydrant, valve and valve box; and delivery of fire hydrant, valve and valve box to the City's yard, located at 4251 Stone School Road.

PAY ITEM

PAY UNIT

Fire Hydrant Assembly Abandonment..... Each

**DETAILED SPECIFICATION
FOR
ITEM #250 – DRAIN PIPE, 6 INCH
ITEM #251 – LANDSCAPE INLET**

DESCRIPTION

This work shall consist of constructing storm sewer overflow drain for rain gardens where noted on plans and specified herein, and as directed by the Engineer.

All work shall meet the requirements of the City of Ann Arbor Standard Specifications, unless specified differently herein.

MATERIALS

Drain Pipe, 6 Inch:

The Drain Pipe shall be 6” SDR 35 pipe and fittings. All pipe to have bell and spigot fittings, and shall meet ASTM D3034.

Landscape Inlet:

The landscape inlets are to be as manufactured by Nyloplast , Part # 7001-110-189, which is a 12 inch diameter drain basin 2812AG. The grate shall be a Nyloplast 12 inch pedestrian grate #1299CGP.

CONSTRUCTION METHODS

The Contractor shall install Drain Pipe, 6 Inch and Landscape Inlet, as shown on the Plans, as detailed in the City Standard Specifications, and as directed by the Engineer.

The Contractor shall assess the conditions and elevations of the rain garden and the outfall end of the drain pipe to insure that positive drainage exists of a least 1/8 inch per foot from the Landscape Inlet and the outfall into the storm sewer system, and install the drain pipe accordingly.

MEASUREMENT AND PAYMENT

Drain Pipe, 6 Inch:

The pay item “Drain Pipe, 6 Inch” shall include excavation, placement of 6” SDR 35 pipe and fittings, tap into drainage structures, and placement of 2NS Sand 3” below to 12” above and on all sides of the pipe and full sand trench backfill.

Landscape Inlet:

The pay item “Landscape Inlet” shall include excavation, placement of inlet, the required risers, supports and fittings for an outlet to the drain pipe, as well as bedding stone and backfill.

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

PAY ITEM

PAY UNIT

Drain Pipe, 6 Inch.....	Linear Foot
Landscape Inlet.....	Each

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

**DETAILED SPECIFICATION
FOR
ITEM #252 - SEWER BULKHEAD, 4-INCH THROUGH 18-INCH DIAMETER**

DESCRIPTION AND MATERIALS

This work shall consist of constructing sewer bulkheads, as specified herein, as shown on the Plans, and as directed by the Engineer.

Materials shall meet the requirements of the City of Ann Arbor Standard Specifications.

CONSTRUCTION METHODS

The Contractor shall install Sewer Bulkheads, as shown on the Plans, as detailed in the City Standard Specifications, and as directed by the Engineer.

MEASUREMENT AND PAYMENT

Furnishing and placing flowable fill as backfill for these items will not be paid separately, but shall be included in the bid prices for these items of work.

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

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Sewer Bulkhead, 4-Inch Through 18-Inch Diameter.....	Each

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

**DETAILED SPECIFICATION
FOR
ITEM #255 - TEMPORARY 6-INCH WATER MAIN LINE STOP
ITEM #256 - TEMPORARY 8-INCH WATER MAIN LINE STOP
ITEM #257 - TEMPORARY 12-INCH WATER MAIN LINE STOP**

DESCRIPTION

The Contractor shall furnish all materials, labor and equipment to properly install and set water main line stops into the existing Ductile Iron Main(s) at the locations as shown on the plans and as directed by the Engineer. All work shall be performed in accordance with the requirements as detailed herein.

The existing mains, upstream and downstream of the proposed line stop(s) cannot be shut down or taken out of service. To ensure that the entire operation shall be accomplished without interruption of service or flow, the installation shall be accomplished by Contractor personnel skilled and experienced in the procedures specific to line stops of the required size(s).

MATERIALS

Bedding and trench backfill materials and compaction requirements shall be in accordance with the detailed specifications, or the details shown on the plans. Granular Material Class II shall meet the requirements of section 902 of the Michigan Department of Transportation 2012 Standard Specifications for Construction. The Engineer shall approve any native materials to be placed as trench backfill.

The Contractor shall submit to the Engineer two (2) sets of drawings, furnished by manufacturers, fully and distinctly illustrated and describing the Line Stop fittings proposed to be furnished. Work shall not commence until such time as the drawings have been reviewed and accepted by the Engineer.

Line Stop Fittings shall be full encirclement, pressure retention type split tee. It shall consist of two steel weldments; an upper line stop flange saddle plate and a lower saddle plate. These two saddle plates shall be contiguous.

1. Line Stop Flange: The outlet of each fitting shall be machined from a 150 lb. forged steel flange (ASTM A181 or A105) or from pressure vessel quality steel plate (ASTM A285, Grade C); flat faced and drilled per ANSI B16.5). Suitable independently operated locking devices shall be provided in the periphery of the flange to secure the completion plug.
2. Line stop Nozzle: The nozzle, which lies between the saddle and the flange shall be fabricated from steel pipe (ASTM A234). After welding and stress relief, the nozzle shall be accurately bored as follows to accommodate the Line stop plugging head:
3. Machine an internal circular shoulder to seal against the circumferential gasket carried on the plugging head.
4. Completion Plug: The completion plug shall be machined from a stress relieved carbon steel weldment. It shall contain two (2) circumferential grooves: one to receive the locking devices from the Line stop flange, and the second to contain a compressible "O" ring to seal pressure tight against the bore of the flange.

5. Blind Flange: Each Line stop fitting shall be closed with a blind flange. Facing and drilling of the blind flange shall be compatible with that of the Line stop flange. Minimum blind flange thickness shall be that of AWWA Spec. 207, Class D.
6. Saddle Alignment Marking: Each saddle-half shall be matched and marked with serial numbers, to insure proper alignment in the field.
7. Fasteners: All bolts, studs, and nuts used on Line stop, drain/equalization fittings, blind flange, and other elements that shall remain upon completion of the work shall be stainless steel and meet the requirements of ASTM F 593.
8. General: Manufacturer will exercise extreme care to insure that weldments are of adequate strength, properly shaped, securely reinforced, and free from distortion that could stress the ductile iron main during installation, pressure tapping, or Line stopping operations. All steel shall meet the requirements of ASTM A36, as a minimum. All weldments shall be braced and stress relieved.
9. Gaskets: Shall be molded from elastomer compounds that resist compression setting and are compatible with water in the 32 to 140 deg. F temperature range.
10. Upper Line stop Flange Saddle: Shall consist of a saddle plate, a Line stop flange, and a Line Stop nozzle. The interior of the saddle plate, adjacent to and concentric with the O.D. of the nozzle, shall be grooved to retain a gasket which shall seal the saddle plate to the exterior of the ductile iron main. This gasket shall constitute the only seal between the main and the fitting. The flange saddle shall also meet the following requirements:
 - A. Saddle plate shall be of a minimum of 0.375" in thickness. It shall be shaped to be concentric to the outside of the ductile iron main. The smallest I.D. of the saddle and its interior rings shall exceed the O.D. of the main by a minimum of 0.250" to allow for ovality of the main.
 - B. Line stop nozzle of 0.375" min. wall thickness shall be securely welded to the saddle plate.
 - C. The Line Stop flange shall be securely welded to the nozzle. After welding, the assembly shall be braced, stress relieved, and bored to receive the completion plug and the circumferential gasket of the Line Stop machine plugging head.
 - D. Bolt, nut of stud, nut, and washer assemblies shall be furnished to draw the upper and lower saddles together for sealing. Bolting brackets shall be gusseted.
11. Lower Saddle Plate: Saddle plate shall be of a minimum 0.375" thickness and shall be shaped to be concentric to the outside brackets shall match upper half.

CONSTRUCTION METHODS

Installation of proposed line stops 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 MIOSHA Standards; the Contractor is solely responsible for determining all excavation and trench safety requirements.

If necessary, The City will reduce the pressure to 100 psig or less for the duration of the installations. The entire operation of installing the line stop shall be accomplished without reduction of water pressure in the

main(s) below 100 psig. It shall be the responsibility of the Contractor to verify pressure prior to commencing the installation.

1. Equipment. The equipment shall consist of a cylindrical plugging head that contains a flat, expandable elastomer sealing element. The plugging head shall be advanced into and retracted from the main by means of a linear actuator. When retracted, the plugging head and carrier are housed in an adapter, bolted pressure tight between the tapping valve and the actuator.
 - A. Sealing Element: The element shall be monolithically molded from a suitable polyurethane compound. The element shall be flat in a plane perpendicular to the flow in the main. Minimum thickness of the element shall be 4". The bottom of the element shall be semi-circular to conform to the bore of the main.
 - B. Drilling equipment: Shall be in good working condition, equipped with power drive to insure smooth cutting, and to minimize shock and vibration. Cutting equipment shall be carbide tipped and capable of being replaced without removal from the jobsite.
 - C. Plugging Head: The diameter of the cylindrical plugging head shall be slightly smaller than the bore of the Line Stop nozzle. The plugging head shall have a suitable circumferential gasket to seal against the shoulder in the Line stop nozzle. This gasket shall also seal against the sealing element to prevent bypass flow around the Line stop.
 - D. Deposits in Bore of Main: The semi-cylindrical bottom of the plugging head shall be designed to break and dislodge tuberculation and other deposits in the bore of the main which might interfere with a satisfactory Line stop.
2. Preliminary Field Inspection of Water Main:
 - A. Dimensional, specification, and other data regarding the existing mains have been taken from existing records. This information may be inaccurate, out of date, and/or inadequate. The data have not been verified by field inspections. Further, the water main consists of ductile iron pipe which may contain dimensional and structural flaws. In addition, the Contractor shall anticipate that exterior main conditions, bells, service connections, or presence of adjoining utilities may require relocation of proposed line stop. Prior to proceeding with the installation of any line stop, it is necessary to know the exact main outside diameter of the water main, if it has any ovality, and the internal diameter of the pipe before line stop fittings and plugging head sealing elements can be manufactured and/or ordered.
 - B. Prior to ordering material, Contractor shall excavate at each proposed location and carefully measure the outside diameter of the water main with calipers along at least four (4) locations to determine ovality and the critical outside diameter of the water main. The Contractor shall determine main wall thickness, uniformity, and structural integrity by means of ultrasonic testing. Data shall be taken to determine extent of internal deposits, tuberculation, etc.
 - C. If the Engineer determines that Contractor's data are not adequate, the Engineer may direct Contractor to make one or more pressure taps on main to obtain test pipe coupons for the Engineer's evaluation. The minimum size of the test coupon shall be 5" diameter, drilled through a nominal 6" valve. Pressure tapping saddles and other materials used for inspection taps shall conform to the requirements of this Special Provision. The Contractor

shall anticipate that heavy interior corrosion and/or tuberculation exists within the water main.

- D. If, in Engineer's opinion, the proposed location is unsatisfactory based on measurements of the existing pipe at the locations of the proposed line stops, the Engineer will direct excavation at another site. Excavating, de-watering, inspections, backfill, and restoration will be paid for separately in accordance with the applicable contract unit prices or Section 109.05.C and 109.05.D whichever the Engineer deems most appropriate.

Because of possible internal corrosion and deposits in existing water mains, a "bottle-tight" shut down may not occur. A satisfactory shutdown which allows the work to be accomplished (i.e. valve replacement, water main tie-in, etc.) using drainage pumps to de-water excavations, with workmen wearing boots and raingear, if necessary, must be obtained. The Contractor will not be allowed to proceed with further work until an acceptable shutdown is achieved. The Contractor shall be aware that this may require the halting of work and re-scheduling of all work operations.

Contractor shall power wire brush and grind the exterior of the water main to remove any debris, corrosion deposits, or other surface irregularities that might interfere with proper seating and sealing of each line stop fitting against each main. Any structural defects in the water main, service connections, appurtenances, adjacent utilities, etc., that could interfere with the line stop installation shall be immediately reported to Engineer.

All line stop fittings and appurtenances shall be cleaned and disinfected in accordance with the current City of Ann Arbor Public Services Area Standard Specifications prior to bolting any of the line stop fittings in place or commencing any pipe cutting.

Contractor shall fit upper and lower saddle plate assemblies to main, thoroughly checking for proper fit to main. Under no circumstances shall Contractor attempt to force, reshape, or bend saddle plates by excessive tightening of saddle studs while the line stop fitting is assembled around the main. Any required retrofitting shall be accomplished with the fitting removed from the main. Any damage to fitting, accessories, or main shall be repaired at Contractor's expense to the satisfaction of Engineer.

Upper and Lower saddle halves shall be drawn together by bolt assemblies and the Saddle plates shall be bolted together in the horizontal position.

All line stop work shall be performed in accordance with the equipment manufacturers approved work procedures and installation guidelines.

Final closure of the water main shall be accomplished by insertion of a manufacturer-approved completion plug. The Contractor shall test the completion plug sealing through the use of a bleed off assembly in the machine housing.

The Contractor shall remove the temporary valve and the installation of a blind flange shall be completed.

The Contractor shall backfill water mains within the limits of the roadbed with granular material Class II. Place backfill in layers no greater than 10 inches thick and compact each layer to at least 95 % of the maximum unit weight. Backfill water main outside the limits of the roadbed with Engineer approved granular or suitable material, compacted to 90% of the maximum unit weight, in lifts of 12 inches or less, unless otherwise noted on the plans.

The Contractor shall place polyethylene encasement meeting the requirements of the City of Ann Arbor

Standard Specifications for Construction around the upper and lower saddle halves, the blind flange, and to a point at least 1 foot on either side of the saddle halves. All polyethylene encasement shall be securely taped to the water main such that water entry is minimized to the greatest extent possible.

MEASUREMENT AND PAYMENT

The work shall include, but not be limited to; pavement saw-cutting; excavation and disposal of excavated material; the furnishing, installation, and removal of sheeting and/or shoring where needed; the furnishing, placement and compaction of approved bedding and backfill materials; furnishing and placing suitable, clean, gravel to create a stable working surface at the bottom of the excavation; de-watering; pipe cleaning, measuring, and performing all advance work necessary to prepare for the performance of the line stop; nighttime lighting as required; the removal of all materials and equipment associated with the work when no longer needed; and, any other items needed to complete the work as detailed on the plans and as specified herein.

Temporary Water Main Line Stops up to and including 6 inch diameter in size shall be paid for as a “Temporary 6-inch Water Main Line Stop”.

The completed work, as described, will be paid for at the contract unit price for the following pay item:

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Temporary 6-inch Water Main Line Stop.....	Each
Temporary 8-inch Water Main Line Stop.....	Each
Temporary 12-inch Water Main Line Stop.....	Each

**DETAILED SPECIFICATION
FOR
ITEM #260 - SAND SUBBASE COURSE, CLASS II - C. I. P.**

DESCRIPTION

This work shall consist of constructing an aggregate subbase on an existing aggregate surface, or on a prepared subgrade in accordance with Sections 301, 302 and 307 of the 2012 MDOT Standard Specifications for Construction, except as specified herein.

MATERIAL

The materials used for this work shall be MDOT Class II granular material meeting the requirements of the City Standard Specifications.

CONSTRUCTION METHOD

Sand or aggregate courses shall not be placed if, in the opinion of the Engineer, there are any indications that they may become frozen before their specified densities are obtained.

Sand or aggregate courses shall not be placed on a frozen base, subbase or subgrade.

The Contractor shall not use rubber-tired equipment on the grade, when its use causes, or may cause, in the opinion of the Engineer, damage to the grade. The Contractor shall conduct his/her operation(s), and provide all necessary equipment, to insure the satisfactory completion of the work without damaging the grade. This includes the transporting, stockpiling, re-handling, and movement of materials over additional distances, in lieu of driving on an unprotected, or partially unprotected, grade.

The Contractor is solely responsible for the maintenance and protection of the grade. Further, any damage to the grade which, in the opinion of the Engineer, is caused as a result of the Contractor's operation(s), or his/her subcontractors' or suppliers' operation(s), shall be repaired by the Contractor at the Contractor's expense. This includes any additional earthwork and/or maintenance materials as directed by the Engineer, for the purposes of the Contractor's maintenance and protection of the grade.

The Contractor shall shape the base, subbase and subgrade to the elevations, crowns, and grades as specified on the Plans and as directed by the Engineer. This may include re-grading the subbase to provide different crown grades than those existing prior to the construction.

The Contractor shall remove, add to, re-shape, re-grade, and re-compact the existing roadbed materials (including the base bed under sidewalks), and shall construct the roadway and sidewalks to the cross-section(s) as indicated on the Plans, as detailed in the Specifications, and as directed by the Engineer. The Contractor shall use blade graders, maintainers, vibratory rollers, and/or other equipment as necessary, and as directed by the Engineer, for this work. Use of each specific piece of equipment is subject to the approval of the Engineer.

The Contractor shall maintain the base, subbase and subgrade in a smooth, well drained condition at all times.

Sand and aggregate courses shall be placed in uniform layers such that when compacted, they have the thicknesses shown on the Plans, or as directed by the Engineer. The loose measure of any layer shall not

be more than 9-inches nor less than 4-inches.

Sand subbase and aggregate base courses shall be compacted to not less than 98% of their respective maximum unit weights, as determined by the AASHTO T-180 test.

All granular materials shall be deposited from trucks or through a spreader in a manner that will minimize segregation of material.

Manholes, valve boxes, inlet structures and curbs shall be protected from damage. Manholes & inlet structures shall be continuously cleaned of construction debris and properly covered at all times during the construction. Upon completion of each day's work, manholes, water valve boxes, inlets and catch basins shall be thoroughly cleaned of all extraneous material.

MEASUREMENT AND PAYMENT

Where granular materials are used as base, as subbase, or as fill for excavations in Machine Grading areas, item of work "Sand Subbase Course CL II - C. I. P. " shall be measured and paid accordingly.

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

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Sand Subbase Course Class II - C. I. P.	Cubic Yard

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

**DETAILED SPECIFICATION
FOR
ITEM #261 – PLANTING SOIL
ITEM # 262 - COMPOSITE PLANTING MIX**

DESCRIPTION

The work consists of providing and placing Planting Soil (Topsoil) in landscape planters, lawn areas, and tree pits, and rain garden soils as shown on the plans, as detailed herein or as directed by the Engineer. All work must be conducted in accordance with the plans and specifications, the 2012 MDOT Standard Specification for Construction, and the City Standard Specifications.

The rain garden cell consists of a layer containing the composite planting mix. Underneath the rain garden soil planting mix lies an underdrain storage trench comprised of an aggregate storage area and an underdrain system to achieve positive drainage. The underdrain flows to an overflow structure at the low point of the of the cell bed.

MATERIAL

Provide materials as described below.

- A. **Planting Soil:** The topsoil provided shall meet the requirements of **City of Ann Arbor Division III, Section 6B. Planting and Backfill Soil Material**, and be amended as noted in Section 6B for use in all landscape applications other than the rain gardens.
- B. **Composite Planting Mix:** The Composite Planting Mix shall be used in all rain garden areas, and shall meet the requirement noted below:

Item	Composition by Volume
Compost	20%
Sand	80%

The rain garden composite planting mix must be a uniform mix, free of plant residue, stones, stumps, roots or other similar objects larger than 2 inches. No other materials or substances are permitted to be mixed or dumped within the bioretention area that may be harmful to plant growth, or prove a hindrance to the planting operations.

CONSTRUCTION METHOD

All earth disturbing activities within the vicinity of the rain garden cell must be substantially complete, and curb and paving work completed prior to the excavation of the rain gardens to minimize siltation. The Contractor must verify that installation can be completed in accordance with the original design and the referenced standards prior to beginning rain garden construction.

Conduct excavation work with the equipment within the footprint of the rain garden as detailed on the plans. No equipment is permitted in the rain garden area unless approved in advance by the Engineer. In those instances where equipment is allowed within the cell bed it must consist of low ground pressure, lightweight equipment. In these instances, ensure the underlying bed soil is restored to a friable condition to a minimum

depth of 12 inches.

Excavate to the depth detailed on the plans and miscellaneous details to accommodate the rain garden soil planting mix and mulch. Final grades shown on the plans are to the top of the soil, or as directed by the Engineer.

Place the the aggregate storage area in accordance with the dimensions shown on the plans.

Place the rain garden soil planting mix in horizontal layers not to exceed 12 inches in depth for the entire area of the rain garden facility. Saturate the rain garden soil planting mix over the entire area after each lift until water flows from the underdrain to lightly consolidate the mix. Apply water by spraying or sprinkling in a manner to avoid separation of the mix components. Ensure the Engineer is present during the saturation of each lift. If the rain garden soil planting mix becomes contaminated during construction, remove the contaminated material and replace with suitable material at no cost to the Department. Perform the final grading of the rain garden soil planting mix after a 24 hour settling period. Upon final grading of the surface of the rain garden soil planting mix rototill to a depth of 6 inches.

The depth of the tree root balls may required the excavation into the aggregate storage area to accomoate the root ball. 8 inches of planting soils shall be placed between the root ball and the aggregate.

MEASUREMENT AND PAYMENT

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

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Planting Soil	Cubic Yard
Composite Planting Mix.....	Cubic Yard

The adjacent stone reservoir and related geotextile fabric related to the rain gardens is paid for separately.

**DETAILED SPECIFICATION
FOR
ITEM # 263 - RIPRAP, FIELDSTONE**

DESCRIPTION

This work consists of providing all labor, equipment and materials necessary to furnish and place fieldstone riprap in the rain gardens as shown on the plans. All work must be conducted in accordance with the plans and specifications, the 2012 MDOT Standard Specification for Construction, and the City Standard Specifications.

MATERIALS

Use washed, uncrushed, rounded fieldstone for riprap. The diameter of each stone must be between 4 to 8 inches. When placed in the final location the in-place thickness must be a minimum of 8 inches. Acceptance will be based on visual inspection of riprap in-place by the Engineer.

Geotextile separation fabric shall be a non-woven fabric, minimum 6 Oz. weight.

Grout shall be MDOT standard grout mix R-3, as specified in Section 702 of the 2012 MDOT Standard Specification for Construction.

CONSTRUCTION METHODS

Place riprap over geotextile separation fabric in accordance with subsection 813.03 of the 2012 MDOT Standard Specifications for Construction, on prepared grades to the elevations, thickness and lateral limits as shown on the plans. Shape and compact all grades to the required cross section. The riprap installation must not damage the geotextile fabric below.

Rock to be grouted shall be kept wet for a least 2 hours immediately prior to grouting. Place riprap such that each stone will be firmly embedded into the grout and against adjoining stones. Construct the riprap in a manner which produces a uniform mat free of voids.

Grout and stone should be installed within 1.5 hours of the completion of the initial mixing of the grout

MEASUREMENT AND PAYMENT

The completed work, as described and including geotextile fabric, stone rip rap and grouting, will be measured and paid for at the contract unit price using the following pay item:

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Riprap, Fieldstone	Square Yard

**DETAILED SPECIFICATION
FOR
ITEM# 264 - LANDSCAPE MAINTENANCE**

DESCRIPTION

For this pay item, the work includes two full years of maintenance of planting areas following the one year of maintenance which is part of the standard Landscape Pay Items. Item #264 Landscape Maintenance shall include but not be limited to; pruning; cultivating; weeding; removal or trash, leaves and debris, watering; fertilizing; and furnishing and applying such sprays and other treatments as necessary to keep all plantings free of insects and diseases.

Debris and Leaf Cleanup, as described in this Detailed Specification, shall also be performed during the initial maintenance and warranty period that is included in the standard Landscape Pay Items (i.e., during the first year after plant installation).

All work must be conducted in accordance with the plans and specifications, the 2012 MDOT Standard Specification for Construction, and the City Standard Specifications.

The Maintenance Contractor shall be a company specializing in native landscape installation and maintenance, native restoration, native seed mix installation and maintenance, including thorough knowledge of native vs. non-native species, and having a minimum 3 years of experience in projects of the scope and scale being specified.

MATERIALS

A. Maintenance Plans and Schedules:

1. Maintenance Plan and Schedule: Maintenance Contractor must submit detailed typewritten methodology and schedules for maintenance of all landscape areas as outlined in Part 3 of this section. The schedule shall be comprehensive and shall be the basis for monthly payments for the duration of the maintenance contract. Maintenance Contractor shall submit Maintenance Plan and Schedule to Owner within 1 week following the issuance of the Notice to Proceed.
 - a. Schedule must identify activities, number of personnel to be involved, tentative calendar schedule, and expected work hours.
2. Maintenance Report Forms: Maintenance Contractor to submit a Maintenance Report Form template to Owner for prior approval.
 - a. Every maintenance visit must be thoroughly and completely recorded on an approved Maintenance Report Form, which will include the date, the maintenance crew's names, weather conditions, maintenance provided, areas that received maintenance, number of hours onsite, chemical rates of application and equipment used, notes on future maintenance/problem, etc.
 - b. Submit Maintenance Report Forms following completion of each maintenance visit. The forms shall cross-reference the Maintenance Plan and Schedule. Payment for this work will only be made by the Owner when proof of completed work has been provided.

B. Product Data Submittals required:

1. Fertilizer.
2. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to the project site.

C. Delivery, Storage and Handling

1. General:
 - a. Packaged Materials: Deliver packaged materials in original unopened containers showing weight, analysis and name of manufacturer. During shipment and storage on site, protect materials from breakage, moisture, heat or other damage.
 - b. No packaged materials may be stored onsite unless Maintenance Contractor receives prior approval from Owner.
2. Pesticides/Herbicides/Chemical Control Agents:
 - a. Storage, handling, application, clean-up, and disposal of all pesticides, herbicides, and other controlled use materials shall be in strict conformance with all government and industry standards.
 - b. Maintain and operate all pesticide/herbicide application equipment according to manufacturer's standards and instructions. Equipment shall be clean, free of leaks, calibrated, and deliver spray patterns as specified by the manufacturer.
 - c. Utilize pesticides/herbicides only for their labeled use and in accordance with precautions, instructions, rates, and timing as specified by manufacturer.
 - d. Pesticides/herbicides shall be applied only by Michigan certified applicators, excluding over the counter types. Notify Owner prior to application of any pesticide, herbicide, or other chemical control agent. Clearly label areas that have received application of these materials.
 - e. Mixing of pesticides, herbicides, and other chemical control materials shall not occur onsite unless Owner has given prior approval.

CONSTRUCTION METHODS

A. Weeding

1. Weeding under this section involves plant beds and tree planters and tree grates.
2. The beds, planters, and grates shall be weeded on a monthly basis through the growing season (typically March through November).
3. Use Integrated Pest Management to control weeds to the extent reasonably possible.
4. Notify the DDA prior to the use of pesticides and herbicides.
5. No pre-emergent pesticide may be used because native species are encouraged to spread via seed.
6. Manual removal of weeds with a trowel or small shovel is recommended to ensure complete removal of weedy root mass. Do not damage or displace adjacent desirable plant species.
7. Legally dispose of weedy plants offsite. Do not allow any seedheads to remain in the project site.

B. Pruning and Deadheading:

1. Most plants at this site are native species and should not require substantial pruning. The natural habit of the plant should be preserved. Shrub beds should be allowed to grow out naturally and become a continuous mass to shade out weeds.
2. All pruning shall conform to standards established by the International Society of Arboriculture.
3. In general:
 - a. Do not shear plants; remove individual limbs back to main trunk or leader (thinning).
 - b. Do not leave stubs longer than ¼”.
 - c. Use the proper tools for the cut being made.
 - d. Keep cutting tools sharp and clean, and disinfect tools between cuts and plants.
 - e. Avoid pruning during rainy weather as this may increase the chance of spreading fungal spores.

- f. Do not prune any oak between April 1 and October 31.
 - g. Prune at the proper time of year for the plant species to be pruned in order to avoid removing next year's flowering buds.
 - h. Do not prune trees or shrubs during the growing season after July 15 because new growth may not harden off before winter.
 - i. Do not deadhead stands of native grasses in order to allow the seeds to further establish the native grass areas. Stands of native grasses may be cut to the ground in early March each year for a cleaner appearance, but the cut grass and seedheads should be left on the ground.
4. Utilize the following procedures when pruning canopy trees, ornamental trees, and shrubs:
- a. Remove dead, damaged, or dangerous branches; branches that interfere with pedestrians; water sprouts, suckers, and crossing branches.
 - b. Assume one pruning each year of each plant species. Review the site with the DDA each spring to review pruning needs.
 - c. Major Storm Damage is not part of this contract.

C. Watering

- 1. Watering shall be conducted on an as-needed basis as defined herein. Native plants at the site are generally drought tolerant and should not be watered regularly or for short durations in order to encourage deeper growth of rootmass. During periods of drought plants should receive 1" of water per week, especially the arrowwood viburnums (*Viburnum dentatum*) and gray dogwoods (*Cornus racemosa*). Plants on slopes will require more water than those on flatter terrain.
- 2. To determine soil moisture within the planting root zone, a hand-held soil moisture meter is recommended.
- 3. Water should not be applied at a rate to disturb or erode soil.
- 4. The use of TreeGator® bags is encouraged for canopy and ornamental trees during periods of drought, but should be removed before winter and during periods of normal precipitation.

D. Fertilizing

- 1. Generally the plants used at the site are native species that should not require long-term fertilization, but fertilization is recommended during the first 3 years following installation.
- 2. Fertilize trees and shrubs in the fall after the first hard freeze but before the ground freezes. Trees less than 6" diameter at breast height (DBH) should receive 0.25 lbs of nitrogen per inch of DBH. Shrubs should receive 1 lb. of nitrogen per 100 square feet of shrub mass per year.
- 3. Do not fertilize after July 15 because new growth may not harden off before winter.
- 4. Perform soil tests once per year to determine nutrient excesses/deficiencies in the soil. Send soil samples to an accredited agricultural soil testing laboratory to test for N, P, K, macro- and micronutrients, as well as pH and organic matter, and obtain a fertilizer recommendation from the testing laboratory.
- 5. Perform additional fertilizer applications as the soil tests indicate.

E. Debris and Leaf Clean-up

- 1. Collect all trash, litter, etc. from the sidewalks, plant beds, planters and grates on a monthly basis through the growing season (typically March through November) and dispose of off-site in a legal manner. Collect leaves from sidewalks and curblines and remove off-site.

F. Guarantee

- 1. The Maintenance Contractor shall repair or replace all defects to plant material and seeded areas arising from poor workmanship, improper use of materials, or through improper care

of any plant or plantings growing within the area covered in this Contract. The total cost of replacements, labor, material, etc. is to be at the expense of the Maintenance Contractor. This does not cover damage or losses caused by acts of nature beyond the control of the Maintenance Contractor. However, it does include any loss resulting from disease or insects where the prudent and timely use of cultural or chemical controls would avoid such loss, and disease or insect brought to the site through replacement plant or landscape material, and any loss resulting from the lack of watering or overwatering.

MEASUREMENT AND PAYMENT

Debris and Leaf Cleanup, as described in this Detailed Specification, shall also be performed during the initial maintenance and warrantee period that is included in the standard Landscape Pay Items (i.e., during the first year after plant installation), and the costs of such work is to be included in individual pay Landscape Pay Items (#810 through #822).

This work will be measured and paid using the following contract item (pay item):

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Landscape Maintenance	Month

Landscape Maintenance will be measured and paid on a unit basis for each month or fraction of month worked through the growing season. The Contractor shall submit copies of the Maintenance Reports with each pay application to demonstrate that the required work has been completed. The work includes all labor, materials, equipment costs, disposal fees and related work for providing these services.

**DETAILED SPECIFICATION
FOR
ITEM # 266 - TREE GRATE, 3 ft. X 5 ft.
ITEM # 267 – TREE GRATE, 3 ft. X 10 ft.**

DESCRIPTION

This work consists of furnishing and installing cast iron tree grates and their frames. All work must be conducted in accordance with the plans and specifications, the 2012 MDOT Standard Specification for Construction, and the City Standard Specifications.

MATERIALS

Provide iron castings conforming to section 908 of the MDOT Standard Specification for Construction that come with a 10-year warranty against breakage. Tree grates and frames are to be the sizes and configurations noted on the plans, with openings slots in a pattern that conforms to ADA guidelines.

Tree grate castings and frames to be furnished and manufactured by Urban Accessories of Tacoma, WA (phone is 877-487-0488). Contractor is to provide the specified tree grate casting and frame, or an equal product approved by the Engineer; as follows:

- A. Tree Grate, 3 ft. x 5 ft.: Shall be 3 ft. x 5 ft. in size (nominal), “Kiva” model, with Urban Accessories manufactured frame, and supports.
- B. Tree Grate, 3 ft. x 10 ft.: Shall be 3 ft. x 10 ft. in size (nominal), “Kiva” model, with Urban Accessories manufactured frame, and supports.

All castings will be made of Ductile Iron meeting ASTM A536 Class 65-45-12, and will a Liquid Coat finish, in black per manufacturer’s process. Ensure all anchoring bolts, nuts, washers, and all other hardware for installation meet the manufacturer’s recommendation.

Furnish certification regarding the compliance of materials incorporated in the work, for approval by Engineer prior to installation.

Ensure all anchoring bolts, nuts, washers, and all other hardware for installation meet the manufacturer’s recommendation.

Furnish certification regarding the compliance of materials incorporated in the work, for approval by Engineer prior to installation.

CONSTRUCTION METHODS

- A. Fabrication
 - 1. Ensure all tree grate castings are manufactured true to pattern and component parts must fit together in a uniform manner.
 - 2. Ensure castings are free of all defects and cleaned by shot blasting.

B. Installation

1. Square up the frame sections and bolt them together. Install the tree grate frame flush and on a plane with the proposed surrounding slope, prior to casting the concrete around it.
2. Set the grates flush with the top of the frame and ensure that the grate does not rock in the frame. Securely bolt grate halves together on the underside. Clean any foreign matter from the grates prior to setting.
3. If the engineer believes that the product or the installation has resulted in either a poorly fitted grate and frame, an unsafe walking surface, or an unacceptable amount of rocking, they may reject the installed product, and require a new installation and/or a new tree grate.

MEASUREMENT AND PAYMENT

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

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Tree Grate, 3 ft. X 5 ft.	Each
Tree Grate, 3 ft. X 10 ft.	Each

The unit price for “Tree Grate, 3 ft. X 5 ft.” and “Tree Grate, 3 ft. X 10 ft.” shall include all labor, material, and equipment costs to perform all the work specified, including thickened concrete edge, frames, grates, hardware, and grate supports.

**DETAILED SPECIFICATION
FOR
ITEM #270 - NO PARKING SIGN
ITEM #271 - SIGN, PORTABLE CHANGEABLE MESSAGE
ITEM #272 - CHANNELIZING DEVICE, 42 INCH
ITEM #273 - BARRICADE TYPE III - LIGHTED
ITEM #274 - BARRICADE TYPE II
ITEM #275 - TEMPORARY SIGN - TYPE B
ITEM #276 - TEMPORARY SIGN - TYPE A
ITEM #277 - PORTABLE WATER FILLED BARRIERS
ITEM #278 - LIGHTED ARROW, TYPE C
ITEM #279 - TEMPORARY PEDESTRIAN TYPE II BARRICADE
ITEM #280 - TEMPORARY PEDESTRIAN TYPE II CHANNELIZER**

DESCRIPTION

Traffic shall be maintained in accordance with the City of Ann Arbor Public Services Department Standard Specifications except as specified in Sections 810, 812, 919, and 920 of the Michigan Department of Transportation (MDOT) 2012 Standard Specifications for Construction, Part 6 of the latest edition of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD), and the City Standard Specifications, and as amended herein.

MATERIALS, EQUIPMENT, AND CONSTRUCTION METHODS

General

Materials and equipment shall meet the requirements specified in the above-designated sections of the 2012 MDOT Standard Specifications.

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

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

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

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

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

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

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

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

The Contractor shall temporarily cover conflicting traffic and/or parking signs when directed by the Engineer, and such efforts will be considered incidental to the work.

Parking violation citations issued to the Contractor, subcontractor and material suppliers, including their employees, shall be enforced under appropriate City Code.

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

Channelizing Devices; II & III Barricades; Type A and B Temporary Signs

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

Channelizing Devices and Barricades shall comply with MDOT specifications.

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

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

"Construction 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.

No-Parking Signs and Posts

Prior to the commencement of any construction activity, the Contractor shall place No-Parking signs as directed by the Engineer. The Contractor shall obtain a permit for "Temporary Permission of Reserve Parking Lane for Work Related Purposes" from the City Engineering Unit. This permit shall be obtained a minimum of 5 days prior to the posting of No-Parking signs.

The City will furnish No-Parking signs to the Contractor at no cost. The Contractor shall furnish the signposts and shall securely bolt the signs to the signposts as directed by the Engineer. The Contractor shall install the signposts at least 2-feet deep into the ground, and there shall be a minimum 6-feet and

maximum 7-foot clearance maintained between the bottom of the sign and the ground. The signs shall be placed at 75-foot intervals (or as necessary) to eliminate parking in the construction area.

The installation of No-Parking signs shall be in accordance with the permit. No-Parking signs shall be installed by the Contractor, as directed by the Engineer, **at least 48 hours prior to the proposed start-of-work/enforcement date.**

No-Parking signs shall be returned to the City at the completion of the work. The cost of unreturned signs will be back charged to the Contractor.

No-Parking signs shall be covered by the Contractor, thereby allowing on-street parking, until between 48 and 36 hours prior to the start of the work. No-Parking signs shall be covered by the Contractor whenever there is no work being performed for a period of time longer than 72 hours.

Portable Water Filled Barriers

Contractor shall submit specifications for all portable water filled barriers to the Engineer for approval prior to the installation of the barriers. Barriers shall comply with TL-2 criteria and as approved by the Engineer. Barrier shall be Triton water filled barrier or approved equal. Barrier to be anchorless, unless directed otherwise by the Engineer. Location and installation shall comply with MDOT Standard Specifications for Construction and as approved by Engineer. The intended use for the barriers is to protect traffic that is within 3 feet of work zones with a surface differential of 12 inches or greater and as specified by the Engineer.

Portable Changeable Message Signs

Review sign requirements and site constraints with Engineer prior to ordering and placing the Portable Changeable Message Signs.

Lighted Arrow, Type C, Furnish & Operate

The contractor shall supply lighted arrow boards as shown on the plans and as directed by the Engineer at an Engineer approved locations. The lighted arrow boards shall comply with MDOT Standard Specifications for Construction. The contractor shall furnish and operate the lighted arrow throughout the duration of the project as directed by the Engineer. The contractor will maintain continuous operation of the lighted arrow when in use.

Temporary Pedestrian Type II Barricade

Provide a temporary pedestrian Type II barricade that meets the requirements of National Cooperative Highway Research Program Report 350 (NCHRP 350) or Manual for Assessing Safety Hardware (MASH), in addition to meeting the following requirements:

1. Provide barricade sections at least 43 inches wide, designed to interconnect to ensure a continuous Americans with Disabilities Act (ADA) compliant tactile barrier. Ensure the connection includes provisions to accommodate non-linear alignment as well as variations in elevation at the installation area.
2. Ensure the top surface of the barricade is designed to function as a hand-trailing edge, and has a height between 32 and 38 inches. Ensure the lower edge of the barricade is no more than 2 inches above the surface of the non-motorized facility. Ensure the top edge of the bottom rail of the barricade is a minimum of 8 inches above the surface of the non-motorized facility. The

barricade may have a solid continuous face. Finally, all features on the front face of the barricade (the face in contact with pedestrians) must share a common vertical plane.

3. Equip both sides of the barricade with bands of alternating 6-inch wide orange and white vertical stripes of reflective sheeting. Two bands of sheeting 6 inches tall and a minimum of 36 inches long containing at least two orange and two white stripes each are required. One band placed near the top and one near the bottom if the barricade section has a solid face. If the barricade consists of two rails, affix one band of sheeting to each rail. Ensure the stripes of reflective sheeting are aligned vertically. Ensure this sheeting meets or exceeds the requirements of ASTM D 4956 Type IV sheeting.

Construct the Temporary Pedestrian Type II Barricade in accordance with the manufacturer's recommendations, Michigan Manual on Uniform Traffic Control Devices (MMUTCD), the plans, and the following requirements:

1. Install the barricade as shown on the plans and as directed by the Engineer. Interconnect all barricade sections using hinge components if necessary to ensure a continuous detectable edge for the entire installation. Ensure the barricade is ballasted according to the manufacturer's recommendations to ensure stability during wind events and contact with pedestrians.

2. When the barricade is installed near motor vehicle traffic, ensure reflective sheeting is visible to motorists.

3. When pedestrian Type II barricades are used to close a non-motorized facility, ensure a sufficient number of barricade sections are used to block the entire width of the facility. The barricade may extend outside the edge of the non-motorized facility but must not be less than the full width of the facility.

4. If sections of multiple colored barriers are used (i.e. safety orange and white) install the sections such that the colors alternate to increase conspicuity.

5. Ensure pedestrian Type II barricades are not used to close a motor vehicle facility. Ensure these barricades are not used to guide pedestrian traffic on a motor vehicle facility in the presence of active traffic. This prohibition includes bicycle/shared use lanes or shoulders in the presence of active traffic.

Temporary Pedestrian Type II Channelizer

Provide a temporary pedestrian channelizer that is crashworthy according to the *National Cooperative Highway Research Program Report 350* (NCHRP 350) or *Manual for Assessing Safety Hardware* (MASH), in addition to meeting the following requirements:

1. Ensure the channelizer is designed to interconnect to maintain continuous delineation along the entire installation. This includes provisions to accommodate non-linear alignment as well as variations in elevation.

2. Ensure the top surface of the channelizer is designed to function as a hand-trailing edge, and have a height between 32 and 38 inches. Ensure this top surface is designed to have a 2 inch horizontal gap between the top edge and the support (if so equipped), to allow for continuous hand-trailing without obstructions. Ensure the lower edge of the channelizer is no more than 2 inches

above the surface of the non-motorized facility. Ensure the top edge of the bottom rail of the channelizer is a minimum of 8 inches above the surface of the non-motorized facility or the channelizer may have a solid continuous face. Finally, all features on the front face of the channelizers (the face in contact with pedestrians) must share a common vertical plane.

3. Equip both sides of the channelizer with bands of alternating 6-inch wide orange and white vertical stripes of reflective sheeting. Two bands of sheeting 6 inches tall and a minimum of 36 inches long containing at least two orange and two white stripes each are required. One band placed near the top and one near the bottom if the channelizer section has a solid face. If the channelizer consists of two rails, affix one band of sheeting to each rail. Ensure the stripes of reflective sheeting are aligned vertically. Ensure this sheeting meets or exceeds the requirements of *ASTM D 4956* Type IV sheeting.

Deploy the temporary pedestrian Type II channelizer in accordance with the manufacturer's recommendations, the Michigan Manual on Uniform Traffic Control Devices (MMUTCD), the plans, and the following requirements:

1. Install the channelizer as shown on the plans and as directed by the Engineer. Interconnect all channelizers using hinge components if necessary to ensure a continuous detectable edge for the entire installation. Ensure the channelizers are ballasted according to the manufacturer's recommendations to ensure stability during wind events and contact with pedestrians.

2. When the channelizers are installed near motor vehicle traffic, ensure reflective sheeting is visible to motorists providing appropriate delineation for the pedestrian path.

3. If sections of multiple colored barriers are used (i.e safety orange and white), install the sections such that the colors alternate to increase conspicuity.

4. Ensure temporary pedestrian Type II channelizers are not used to guide pedestrian traffic on a motor vehicle facility in the presence of active traffic. This prohibition includes bicycle/shared use lanes or shoulders in the presence of active traffic. Ensure temporary pedestrian channelizers are not used to channelize motor vehicle traffic, or separate motor vehicle and pedestrian traffic.

MEASUREMENT AND PAYMENT

General

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

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

Barricade Type III - Lighted

Payment for furnishing and operating lighted Type III barricades shall be for the maximum quantity in-place at any one time during the work of the entire project (all streets).

Barricade Type II

Payment for furnishing and operating Type II barricades shall be for the maximum quantity in-place at any one time during the work of the entire project.

Temporary Sign - Type B

Payment for Type B signs shall be for the maximum quantity used on each street. Includes all special signs that are custom-made for the project.

Temporary Sign - Type A

Payment for Type A signs shall be for the maximum quantity used on each street. Includes all special signs that are custom-made for the project.

-Channelizing Device, 42 Inch – Furnish & Operate

There will be a one-time payment for each street for the maximum number of 42 inch channelizing devices in-place (operated) at any one time, as directed by the Engineer.

No-Parking Signs

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

Portable Changeable Message Signs

Measurement for furnishing and operating Portable Changeable Message Signs will be for the maximum quantity in- place at any one time during the work of the entire project (all streets).

Portable Water Filled Barriers

Measurement for furnishing and operating Portable Water Filled Barriers will be for the maximum quantity in-place at any one time during the work of the entire project (all streets). Installing, adjusting, moving, placing, repairing, maintaining, and all related work shall be included in the pay item for “Portable Water Filled Barriers”.

Lighted Arrow, Type C

Measurement for furnishing and operating the lighted arrow boards will be for the maximum quantity in-place at any one time during the work of the entire project (all streets). Installing, adjusting, moving, placing, repairing, maintaining, and all related work shall be included in the pay item for “Lighted Arrow, Type C, Furnish & Operate”

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

Temporary Pedestrian Type II Barricade AND Temporary Pedestrian Type II Channelizer

Payment for Temporary Pedestrian Type II Barricade AND Temporary Pedestrian Type II Channelizer shall be for the maximum quantity used on each street. Includes all special signs that are custom-made for

the project.

One Pedestrian Type II Barricade is defined as a barricade section at least 43 inches wide, including all supports, ballast, and hardware

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Channelizing Device, 42 Inch	Each
Barricade Type III - Lighted	Each
Barricade Type II	Each
Temporary Sign, Type B.....	Square Foot
Temporary Sign, Type A.....	Square Foot
No-Parking Sign	Each
Sign, Portable Changeable Message	Each
Portable Water Filled Barriers.....	Linear Foot
Lighted Arrow, Type C	Each
Temporary Pedestrian Type II Barricade	Each
Temporary Pedestrian Type II Channelizer	Each

**DETAILED SPECIFICATION
FOR
ITEM #281 – URBAN BENCH
ITEM #282 – URBAN TABLE AND BENCHES
ITEM # 284 – REINSTALL PLAZA AMENITIES**

DESCRIPTION

This work consists of furnishing and installing a metal bench in accordance with the details and at the location on the plans. This includes any necessary excavation, drilling into pavement, assembly, and disposal of unsuitable materials and packaging required for a complete installation. All work must be conducted in accordance with the plans and specifications, the 2012 MDOT Standard Specification for Construction, and the City Standard Specifications.

MATERIALS

A. Urban Bench, and Urban Table and Benches

Provide materials selected and approved by the DDA. The materials will include the anchor bolts, nuts, washers, and all other hardware required for installation in accordance with the specifications herein, details included on the plans and per the manufacturer's recommendations.

Shop drawings from the manufacturer are to be submitted to the Engineer for approval prior to fabrication.

Furnish and install Urban Bench and Urban Table and Benches as manufactured by Forms + Surfaces of Pittsburgh, PA (800-451-0410):

1. Model # SBTRO-72NA; Trio Bench, 6 foot length, backless.
2. Model # STTRO-72SA; Trio Table Ensemble, 6 foot length, (non-ADA model)
3. Model #STTRO-72SA-ADA; Trio Table Ensemble, 6 foot length, (ADA model). Three of the specified quantity of Urban Table and Benches shall be the ADA model.

These site furnishings will also meet the following requirements:

- All Urban Benches shall be supplied with the one optional intermediate armrest in the middle of each bench.
- The site furnishings shall be made of cast aluminum end pieces and structure, and extruded aluminum slats, with a powder coated finish.
- The bench shall be electrostatically powder-coated with a non-VOC, anti-graffiti finish. Color and finish to be "Dark Grey Metallic Texture" as provided and specified by Form + Surfaces. The final color will be selected by the Engineer from manufacturer's samples.
- Site furnishings must be surface mounted and installed per the manufacturer's recommendations.

- All anchoring bolts, nuts, washers, and all other hardware for installation to be stainless steel.

When requested by the Engineer, the Contractor must furnish certification regarding the compliance of materials incorporated in the work.

Contractor is to provide the specified site furnishings, or an equal product approved by the Engineer.

- B. For PLAZA AMENITIES, REM AND SALVAGE, the contractor is to reinstall the following in the area adjacent to the Farmer’s Market or within the project area, where directed by the Engineer:
1. Two benches
 2. One precast concrete planter
 3. One solar display kiosk, as modified by City
 4. One stainless steel and glass historic marker, including pavement at base of sign to match previously existing, and reinstallation of plaque and stainless ring within pavement.
 5. One set of five “carrot” themed bike hoops
 6. One Directory Sign (Detectable Warnings to be paid for separately)

Any additional new hardware or foundations required for this pay item is assumed to be included in the pay item, and shall be made of stainless steel.

CONSTRUCTION METHODS

Install and anchor the Urban Bench and Urban Table and Bench in the concrete sidewalk in accordance with the details as shown on the plans and the manufacturer’s recommendations. The benches and tables must be level and square to each other and the surrounding site features, and set in a true, flat plane to prevent rocking. Review all locations of site furnishings in this specification with the Engineer prior to installation. The engineer reserves the right to select alternative locations.

MEASUREMENT AND PAYMENT

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

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Urban Bench.....	Each
Urban Table and Benches	Set
Reinstall Plaza Amenities.....	Lump Sum

Urban Bench, Urban Table and Benches, and Reinstall Plaza Amenities includes all labor, materials (excluding salvaged materials for Plaza Amenities), and equipment necessary to complete the work as described.

The ADA model and non-ADA model of the Urban Table and Bench will be paid for at the same pay item sum.

**DETAILED SPECIFICATION
FOR
ITEM # 283 - BIKE HOOP**

DESCRIPTION

This work consists of furnishing all labor, equipment, materials, required to place bike loops in the areas shown on the plans. All work must be conducted in accordance with the plans and specifications, the 2012 MDOT Standard Specification for Construction, and the City Standard Specifications.

MATERIALS

Provide bike hoop materials selected and approved by the DDA. The materials will include the anchor bolts, nuts, washers, and all other hardware required for installation in accordance with the specifications herein, details included on the plans and per the manufacturer's recommendations.

Shop drawings from the manufacturer are to be submitted to the Engineer for approval prior to fabrication.

Furnish and install bike hoops with the following specifications:

1. All pipe and anchoring hardware materials are to be made of stainless steel.
2. Fabricate bike hoops as dimensioned on the plans.
3. The finish of the bike hoops is to be powder-coated galvanized steel, black.
4. The bike hoop pipe is to be Schedule 40.
5. Bike hoops must be surface mounted, and embedded where shown and as noted on plans; install per the manufacturer's recommendations.
6. All anchoring bolts, nuts, washers, and all other hardware for installation to be stainless steel.

CONSTRUCTION METHODS

Embedded installation is required in locations with unit pavers as a pavement; surface mounting is required in areas with poured concrete pavement. Identify each part prior to assembly, only after final adjustment and leveling permanently tighten all bolt, nuts, and fasteners.

Evenly space bike hoops at the dimensions noted on plans. Bike hoops must be installed plumb and in line with each other, and shall be firmly connected to the foundation or pavement so as to prevent rocking.

Perform the construction methods in accordance with section 803 of the 2012 MDOT Standard Specification for Construction unless otherwise stated in this special provision.

MEASUREMENT AND PAYMENT

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

PAY ITEM

PAY UNIT

Bike Hoop..... Each

Both embedded and surface mounted bike hoops will be paid for as a single pay item.

**DETAILED SPECIFICATION
FOR
ITEM # 285 – REMOVE PARKING METERS
ITEM #286 - INSTALL PARKING METERS**

DESCRIPTION

This work shall consist of removing parking meter standards and installing new meter standards where directed. All work must be conducted in accordance with the plans and specifications, the 2012 MDOT Standard Specification for Construction, and the City Standard Specifications.

MATERIALS

Republic Parking will supply all standards. Standards are steel tubes 60” to 63” in length and 2” square.

All sand shall meet the gradation of MDOT Class II granular material in accordance with Section 902 of the 2012 MDOT Standard Specifications for Construction.

Concrete shall be Grade P2 in accordance with Section 601 of the MDOT 2012 Standard Specifications for Construction.

CONSTRUCTION METHODS

1. Removal. Meter standards requiring removal will be marked by the City. Prior to removal, contact Republic Parking at (734) 761-7235 for the removal of the parking meter heads. The Contractor is not permitted to remove the meter heads, nor remove the standard with the meter head still in place.

The Contractor shall remove the standard and concrete foundation. The void is to be backfilled with Class II Granular Material or Engineer approved backfill. The standards and concrete will then become of the property of the Contractor and shall be properly disposed of offsite.

2. Installation. The City will stake the location for the new meter locations. The location is approximately 18” to 24” from curb line, and 48” from front end of stall for parallel parking.

a. Installation in sidewalk/concrete. Core an 8” diameter hole through the concrete sidewalk at the meter location points. When working in close proximity of underground lines, use caution to avoid drilling beyond the thickness of the sidewalk in order to prevent damage to lines. For installation in new sidewalk, the standard may be installed prior to placing walk, or the walk may be placed around a form in the location of the proposed standard.

After drilling through the sidewalk, excavate approximately 30” deep, with an 8” diameter opening, and tapering outward to 10” at the bottom.

Set the standards into the concrete filled holes with the REAMED END to the TOP and WEEP HOLE on LOWER END FACING THE STREET. The meter standard is to project 37” above the sidewalk level.

Check the vertical plumb with the surface level, first in one direction and then in the other and then hold the standard securely in position with forms until the concrete has set.

After the standards have been plumbed, check the vertical alignment down the street and the

height uniformity, making such corrections and adjustments as necessary.

b. Installation in soil. Excavate holes approximately 30” deep, with an 8” diameter opening, and tapering outward to 10” at the bottom.

Set the standards into the concrete filled holes with the REAMED END to the TOP and WEEP HOLE on LOWER END FACING THE STREET. The meter standard is to project 37” above the finished grade.

Check the vertical plumb with the surface level, first in one direction and then in the other and then hold the standard securely in position with forms until the concrete has set.

After the standards have been plumbed, check the vertical alignment down the street and the height uniformity, making such corrections and adjustments as necessary.

The Contractor is responsible for the protection of the standard until the concrete foundation has set. If the standard is not plumb upon curing of the foundation, then the standard will be removed and reset at the contractor’s expense. The Contractor shall use plastic drums and caution tape, “Wet Paint” signs, or other methods to protect the standards.

Meter heads will be installed by Republic Parking upon installation of the standards.

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>PAY ITEM</u>	<u>PAY UNIT</u>
Remove Parking Meter.....	Each
Install Parking Meter	Each

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in this Detailed Specification. The quantity paid is based on the number of new parking meters installed.

Disposal of standards, concrete foundations, and all excavated material is included in the unit prices for the above items.

Material to backfill voids after removing the standards is included in the pay item “Remove Parking Meter”.

**DETAILED SPECIFICATION
FOR
ITEM # 287 – 2” SCHEDULE 80 PVC ELECTRICAL CONDUIT
ITEM #288 – 3” SCHEDULE 80 PVC ELECTRICAL CONDUIT
ITEM #289 - 4” SCHEDULE 80 PVC ELECTRICAL CONDUIT
ITEM #291 – SPECIAL TRENCH DETAIL**

DESCRIPTION

This work shall include the excavation and proper disposal off-site of excess excavated material, the installation of conduits, the placement of MDOT Class II bedding and backfill compacted to 95% of its maximum unit weight, and the installation of pull strings and detection tape. All work shall be completed in accordance with Sections 819 and 918.01 of the MDOT 2012 Standard Specifications for Construction, the City of Ann Arbor Standard Specifications for Streetlight Installation and Construction, as shown on the plans, as directed by the Engineer, and as modified herein.

CONSTRUCTION

Schedule 80 PVC conduit will be used for ALL areas of the project.

All conduits, including sweeps into handholes, and fittings shall be installed in accordance with the latest revision of Article 347 of the National Electric Code (NEC). The minimum sweep radius of the conduit shall measure at least 7 inches. After clearing the conduits, the Contractor shall install a pull line and install a plug or cap (suitable for removal at the time of future cable installation) for each conduit.

Trenching, placement of conduit, and backfilling shall be completed as outlined in the City of Ann Arbor Standard Specifications for Streetlight Installation and Construction.

Detectable Marking Tape shall also be installed with the conduit which will allow for detection using an inductive method. The tape shall be pigmented polyolefin film with a printed message on one side. The ink used to print the material shall be permanent which cannot be removed by normal handling or upon underground burial. The polyethylene shall be chemically inert and shall not degrade when exposed to alkalies, acids and other destructive substances commonly found in soil. The tape shall be placed continuously, 6 to 8 inches above the buried conduits with overlap where splices are required. Over the conduit between the communication handhole assemblies, the tape shall be orange in color and shall read "Fiber Optic Cable - City of Ann Arbor Transportation." Over the conduit between the street lighting handholes, the tape shall be red in color and shall read "Caution—Buried Electrical Line."

A Tracer Wire, 1/C #10 RHH/RHW/USE, shall be placed around the conduits that are to be utilized for future traffic signal interconnection. The tracer wire shall be continuous and run from handhole to handhole.

The Contractor shall install conduit utilizing trenchless excavation methods for placing conduit under existing curb and gutter, sidewalks, driveway approaches, etc. which will remain in place.

The Contractor shall provide and install appropriate non-metallic sleeves and gasketed expansion couplings for each conduit if it is required to be installed in a bridge at each bridge joint. The Contractor shall submit catalog “cuts” of the proposed materials for review by, and approval of, the Engineer prior to ordering materials or performing any of the work.

“Special Trench Detail” covers the trenching of conduits through areas of existing brick sidewalk, and includes the removal of pavers and base support, salvage of bricks, and reinstallation of existing brick pavers, as well as any additional effort for trenching for conduit and backfilling of trench that may be above the typical Electrical Conduit pay item. Bricks shall be removed, salvaged and reinstalled following the construction and material requirements outlined in the brick paving specifications elsewhere in this project, including sand setting bed. Brick base shall be 10 inches of MDOT 21AA aggregate, installed in two compacted lifts to 95% dry density. If existing brick are set on concrete, install a matching concrete base in lieu of the MDOT 21AA aggregate, at no additional cost.

Conduits following the same path may be installed in the same trench, and will be paid for separately.

MEASUREMENT AND PAYMENT

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

<u>PAY ITEMS</u>	<u>PAY UNIT</u>
2" Schedule 80 PVC Electrical Conduit	Linear Foot
3" Schedule 80 PVC Electrical Conduit	Linear Foot
4" Schedule 80 PVC Electrical Conduit	Linear Foot
Special Trench Detail	Linear Foot

All work indicated herein shall be included in the unit prices for the above pay items and shall include all labor, materials and equipment required to complete the work.

The per foot unit price for "X" Schedule 80 PVC Electrical Conduit" shall include the installation of each conduit. Conduits following the same path may be installed in the same trench, and will be paid for separately. Also included in the unit price shall be the labor, materials, and equipment costs associated with the installation of the conduits, including, but not limited to, fittings, sweeps, pull strings, end caps, sleeves, tracer wire, backfilling, and all other materials necessary for placing conduit as shown on the plans, and specified herein.

“Special Trench Detail” shall be paid for at the Contract unit price each and shall include all labor, equipment, and materials, including, but not limited to removal, salvage, and reinstallation of existing brick pavers, stone paver base, sand setting bed, as well as any additional costs for trenching for conduit and backfilling of trench that may be above the typical Electrical Conduit pay item expense. Electrical Conduit is paid for as a separate pay item. Special Trench Detail will only be paid for once per Linear Foot, even if multiple conduits are included in the trench.

**DETAILED SPECIFICATION
FOR
ITEM #290- STREETLIGHT, REMOVE
ITEM #292 - LUMINAIRE INSTALLATION
ITEM #293 – POLE INSTALLATION
ITEM #295 – SPECIAL PLAZA LIGHTING
ITEM #296 - ELECTRICAL WIRING
ITEM #296.6 - ELECTRICAL WIRING – 6 GAUGE
ITEM #296.8 - ELECTRICAL WIRING – 8 GAUGE
ITEM #296.10 - ELECTRICAL WIRING – 10 GAUGE
ITEM #296.12 - ELECTRICAL WIRING – 12 GAUGE**

DESCRIPTION

This work shall include the furnishing, installation and testing of the street lighting fixtures at the locations shown in the plans, and as directed by the Engineer to provide a complete working system ready for use. All work shall be completed in accordance with the National Electric Code (NEC), Section 819 of the Michigan Department of Transportation 2012 Standard Specifications for Construction, the City of Ann Arbor Standard Specifications, and as specified herein.

Any costs associated with the obtaining a permit for the electrical work will be paid for by the Contractor, at no additional expense to the DDA or City.

MATERIALS

The Contractor shall furnish all materials and equipment required to install and place in operation Street Light Fixtures, except as clarified below. All materials shall meet the requirements of the current IEEE, NEMA, ANSI Standards as applicable, MDOT 2012 Standard Specifications for Construction, the City of Ann Arbor Standard Specifications, and as specified herein. All electrical components shall be furnished new and be listed by, and bear the label of Underwriter’s Laboratories, Inc.

1. Street light fixtures shall be pre-purchased and provided to the Contractor by the DDA for use in this project. The light fixtures shall be complete, fitted with LED assembly and driver, fuses, support brackets, etc. The Contractor will arrange with the manufacturer for the delivery and storage of all items required for the complete installation.
2. Light poles, clam shell base pieces, and banner brackets (if used) shall be pre-purchased and provided to the Contractor by the DDA for use in this project. The Contractor will arrange with the manufacturer for the delivery and storage of all items required for the complete installation.

Street light fixtures shall be installed complete with wiring from the base to the luminaires including pole base fuse holders. Wiring installed in lighting standard poles between luminaires and taps in base shall be copper conductors type “XHHW” No. 10 AWG minimum, in conduit.

Cable and wire shall be manufactured by:

	Collyer	Hatfield	Reynolds
	Esses	Kaiser	Rome
Anaconda	General Cable	Okonite	Southwire
Cerro	General Electric	Phelps Dodge	Triangle

Conductors are to match the sizes of the wires being replaced, unless otherwise specified to be larger

herein, or directed by the Engineer.

The connection of conductors from size #12 AWG and larger to terminal parts or other conductors shall be made with heavy-duty cast alloy solderless connectors of the pressure double indent type. Tap connectors at light standards shall be multiple aluminum connector with four positions for #2 AWG copper and a 5th position for #12 AWG or larger fixture wire. Connectors shall be Utilco Catalog No. SLC-4-0-1-L with cover for tap block.

Ground rods shall be copper clad steel, and shall be either two 1/2-inch diameter round by 6-foot long rods, or one 5/8-inch diameter round by 8-foot long rod, as shown on the plans.

Fuse holders shall be watertight, in-line, break-away type, 30A, 600V with insulating boots. Install one fast-acting fuse per phase conductor. Fuses shall be five ampere and/or sized for the fixtures being protected.

Provide 20A, 125VAC NEMA type 5-20R ground fault circuit interrupter (GFCI) receptacle with solid-state ground fault sensing and circuit interrupter Class A, Group 1. Per UL standard 943-2003, manufacturer after January 1, 2003 and five milliamperes ground fault trip level. Receptacles must be rated for outdoor use and meet current code requirements for the intended application.

All fasteners shall consist of stainless steel tamperproof screws, bolts, nuts, washers, etc. All anchor bolts and associated washers, nuts, studs, and couplings shall conform to the requirements of the Michigan Department of Transportation 2012 Standard Specifications for Construction, Section 908.14, and shall be galvanized in accordance with ASTM A-153 or as noted on the Drawings.

Prior to beginning construction, the Contractor shall submit to the Engineer product data sheets and Manufacturer's certifications of all wiring, splices, lamps, rods, base plates, anchor bolts, and other parts used in the construction of the light and pole assembly. Certifications shall indicate that all materials meet the minimum requirements of these specifications.

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 schedule.

Materials for "Special Plaza Lighting" are provided on the plans, and include poles, flood lights, festoon string lights, and related fittings and mounting details.

CONSTRUCTION METHODS

The Contractor shall provide temporary street lighting during the entire construction period, providing the equivalent of half of the current light levels on the street, either through the use of existing street lights, installed lights as specified, or other temporary equipment and measures.

Remove conduits and wires as indicated in the plans and specifications, and where the existing wires are replaced by new wires. Unused and unnecessary conduit that is located in undisturbed soils may remain in place.

The Contractor shall provide all labor, materials, tools, equipment, and supervision required for the furnishing and installing of the street lighting fixtures and new GFCI outlets. Connections to equipment, lighting standards, contactors, etc., shall be made in accordance with applicable building and electrical codes and the recommendations from manufacturers of the particular equipment furnished. Any and all additional connections called for by the equipment manufacturer's or otherwise required for the successful operation of the particular equipment furnished shall be installed by the Contractor as part of his Contract with no additional compensation.

The Contractor shall examine all fixtures and poles delivered to jobsite prior to installation to ensure all specification requirements and shop drawing notes & comments have been incorporated by manufacturer. Installation of fixtures signifies Contractor's acceptance and approval of fixtures from manufacturer.

Contractor must provide adequate storage space for all electrical equipment, conduit, and materials delivered to the job site under a weather-protected enclosure. Location of the space must be approved by the Engineer. Equipment set in place in unprotected areas must be provided with temporary protection.

The Contractor shall be responsible for maintenance of, and repair of damage as a result of accident or vandalism to, the light fixtures, bases, luminaries, and all other materials installed, or to be installed, related to, or necessary for the light fixture and pole installation on the project. This shall remain the Contractor's responsibility until the installation is complete, tested, and accepted by the Engineer.

All connections shall be per the manufacturer's recommendation. Where Utilco connections are not used, all joints in outlet or junction boxes shall be taped in such manner that the insulating value of the joint or splice will be at least equal to the insulating value of the conductor to which it is applied.

Wire brush and apply approved corrosion inhibiting compound all connections.

Ground cables shall be #6 AWG, soft drawn, bare, stranded copper wire. Pressure-type connectors shall be used to connect the ground cable to poles and electrical equipment. The cable shall be properly attached to the ground rods.

All fixtures and poles shall be thoroughly and permanently grounded at each location. Grounding shall be in accordance with the latest National Electric Code and as shown on the Drawings, as a minimum. At the disconnect cabinet, the Detroit Edison neutral, the disconnect cabinet, and the ground mat system shall all be permanently grounded together. The resistance of the ground rod to ground shall not exceed 25 ohms when tested with a megger. In case the resistance is more than 25 ohms, additional or longer ground rods shall be installed.

Install concrete poles foundation where indicated on the drawings. Base of the foundation is to rest on undisturbed subgrade or on 21AA Limestone Aggregate (or pea stone) compacted to not less than 98% of its maximum unit weight. Backfill pole foundation with 21AA Limestone Aggregate (or peas stone) in 6 to 8 inch lifts, compacting each lift as the hole is filled. Precast concrete pole shall be set plumb and in-line with existing poles, with no more than one-half inch deviation from plumb in any direction.

All excavation for main conduit runs shall be of a depth to leave at least 30 inches from the top of the conduit encasement or top of direct buried rigid conduit to grade of top of curb or surrounding terrain. For lateral flexible conduit, the corresponding dimensions shall be 30 inches. The trench shall be graded to handhole and pole location so that the finished conduit run will contain no pockets where water might accumulate or drain into a handhole or pole.

Conduit shall be cut with a hacksaw or other approved tool. The ends shall be square after cutting and the

conduit shall be reamed. All conduits must be securely fastened to boxes with locknuts and bushings of an approved make, care being taken that the full number of threads project into the bushings. Rigid galvanized conduit shall be assembled by means of approved threaded galvanized coupling, unions, and fittings. PVC conduit shall be assembled by means of approved threaded or solvent-welded fittings.

Conduits which are installed underground or concealed in concrete, foundations, or other structures, shall be cleared of foreign material and obstructions, after installation and before conductors or pull wire are drawn in, by wire brushing, swabbing and employing an iron or hardwood mandrel which is 1/4" smaller in diameter than the internal diameter of the duct or conduit.

Conduits shall be cut a minimum of 1 inch above the light pole base and not more than 2 inches above the base.

Cable shall be pulled into conduits using a proper cable grip for the purpose. The cable shall be so handled that it is not subjected to excessive strain or kinked when pulled through the conduit. Damaged or kinked cable shall not be used. Where more than one cable is to be installed in a conduit, all cables shall be pulled through simultaneously. Splices in ducts and conduit will not be permitted.

Cables shall be neatly racked and identified on cable racks in all handholes after being formed to their final position. Cables shall be racked slightly higher than the duct entrances so that they will not rest on the edges of the duct. Cables shall be properly tagged in all handholes and poles. All splices and connections shall be made as described herein and as shown on the details. Where cable is installed but not immediately spliced, the cable ends shall be thoroughly sealed and racked out of the way of possible danger.

Conductors shall not be installed in conduit until all work which might cause damage to the conduits or cables has been completed. Street light conductors shall be installed in continuous lengths from light to light with connections in the base of lights or street light pull boxes. All splices shall be accessible through the pole handhole and shall extend 4"-6" outside the handhole. No splices will be allowed which are inaccessible inside the pole. Street lighting splices required in ground handholes shall be terminated using splice kits that insulate, seal, and protect the splices.

Printed color code phase identification shall be repeated at all connections. The printing of the conductor coding shall be repeated at all connections. The printing of the conductor coding shall adhere to covering and not be readily removed by rubbing.

Where Utilco connections are not used, all joints in outlet or junction boxes shall be taped in such manner that the insulating value of the joint or splice will be at least equal to the insulating value of the conductor to which it is applied.

All trenching and backfilling to install electrical work shall be by the Electrical Contractor. When backfilling the trenches under areas to be paved and around street light foundations, the earth must be compacted in place (in 6-8" layers) to 95% of the material's maximum dry density.

Any excess excavated native material that cannot be placed back into the trench from which it came is to be disposed of as detailed in the special provision entitled "Non Hazardous Contaminated Material". Any excess excavated fill material placed as part of this project is to be used or "wasted" on site as directed by the Engineer. If it is unable to be incorporated into the final work, at the sole discretion of the Engineer, the excess excavation shall be disposed of offsite at no additional cost.

The use of equipment, or any part thereof, for purposes other than testing, even with the Engineer's consent, shall not be construed to be an acceptance of the work on the part of the Engineer, nor shall it be construed to obligate the Engineer in any way to accept improper work or defective materials.

Upon completion of the underground work, the Contractor shall grade the work area smooth, filling any trench settlements, eliminating any large piles of earth and cleaning up any debris, or left over construction materials and disposing of it offsite at an approved manner and location.

All factory finished equipment shall be cleaned at the completion of the work by the Contractor. Equipment showing marks or rust shall be refinished by the Contractor in a manner acceptable to the Engineer.

MEASUREMENT AND PAYMENT

The cost of providing temporary street lighting as specified herein shall not be paid for separately.

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

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Streetlight, Remove.....	Each
Luminaire Installation	Each
Pole Installation.....	Each
Special Plaza Lighting.....	Lump Sum
Electrical Wiring.....	Linear Foot

“Streetlight, Remove” shall be paid for at the Contract unit price each and shall include all labor, equipment, and materials, including, but not limited to excavation of pole foundation, removal of light pole fixture, and attached appurtenances, complete removal of the concrete foundation, and disposal of the light fixtures, poles and attached appurtenances, and backfilling the excavation with MDOT Class II fill, compacted in 6 inch layers to 95 % dry weight density.

“Luminaire Installation” shall be paid for at the Contract unit price each and shall include all labor, equipment, and materials, including, but not limited to new wiring from the base of the pole to the fixture and outlet, cable splicing, fittings, supports, hangers, connectors, tape, fuses, grounding equipment; new water proof outdoor rated GFCI outlets, and, any other materials required for complete installation of the light fixture and outlet onto the light pole and its foundation; all required testing; and, placing light fixtures and pole assemblies into service. The luminaire fixtures will be provided by the DDA.

“Pole Installation” shall be paid for at the Contract unit price each and shall include all labor, equipment, and materials including, setting pole and anchor bolts. The light pole will be provided by the DDA. Install the pole such that the handhole is on the opposite side of vehicle traffic (i.e., a person accessing the handhole would be facing the traffic).

“Special Plaza Lighting” shall be paid for at the Contract Lump Sum and shall include all labor, equipment, and materials including, poles, flood lights, festoon string lights, power pedestals, wiring from the base of each pole and pedestal, and related fittings and mounting details. All products and materials for “Special Plaza Lighting” will be provided by the Contractor.

“Electrical Wiring” shall be paid for at the Contract unit price based on the linear foot of each single conductor wire installed, as measure from connection point to connection point. Electrical Wiring shall include all labor, equipment, and materials, including, but not limited to wiring, splicing, connections, tape and related materials and labor necessary to make the electrical system operational. Current electrical conductors being replaced range in size from No. 6 to No. 12. This pay item includes the removal of any conduit and wires indicated on plans for removal.

**DETAILED SPECIFICATION
FOR
ITEM #297 – HANDHOLE ASSEMBLY, 12 INCH X 18 INCH
ITEM #298 – HANDHOLE ASSEMBLY, 17 INCH X 30 INCH**

DESCRIPTION

This work shall consist of furnishing and installing traffic signal handholes and communication handhole assemblies at the locations shown in the Plans, or as directed by the Engineer. All work shall be completed in accordance with the current National Electric Code (NEC), Section 819 of the Michigan Department of Transportation 2012 Standard Specifications for Construction, except as specified herein.

MATERIALS

All materials shall be new and meet the requirements of the current IEEE, NEMA, ANSI Standards as applicable, and as specified herein.

The Contractor shall submit product data sheets for all handholes, covers and other parts for Engineer approval prior to ordering materials. The manufacturer "Quazite Composolite," referenced below, is located in Lenoir City, Tennessee.

12 inch x 18 inch handhole assemblies shall consist of "Quazite Composolite" box. The box shall be #PG1118BA12. The cover shall be, #PG1118HA41, a locking heavy-duty bolt-down type with a logo that reads "Street Lighting." The total depth of the handhole shall be 12 inches.

17 inch x 30 inch handhole assemblies shall consist of two, stacked "Quazite Composolite" boxes. The lower box shall be #PG1730BB18. The upper box shall be #PG1730BA18. The cover shall be #PG1730HA46, a locking heavy-duty bolt-down type with a logo that reads "Traffic Signal." The total depth of the handhole shall be 36 inches.

24 inch x 36 inch handhole assemblies shall consist of "Quazite Composolite" box. The box shall be #PG2436BA24. The cover shall be # PG2436HA12, a locking heavy-duty bolt-down type with a logo that reads "Street Lighting." The total depth of the handhole shall be 24 inches.

Provide Granular Material, Class II in accordance with Section 902.

CONSTRUCTION

Handholes shall be placed at all junctions of traffic signal or electrical conduit, and as shown on the plans. Maximum distance between any two handholes shall be as shown on the Plans, but in no case shall exceed 500 feet.

Place foundation material consisting of 4 inches of MDOT Class II sand compacted to 95% of its maximum unit weight.

Set the handhole or stacked units to the proper depth and elevation.

Connect handholes to new and existing conduits, whether shown on the plans or not. All conduits shall

be connected to the handholes in accordance with the latest revision of Article 346 of the National Electrical Code (NEC).

Backfill around the perimeter of the handhole with MDOT Class II material compacted to 95% of its maximum unit weight.

MEASUREMENT AND PAYMENT

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

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Handhole Assembly, 12 inch x 18 inch	Each
Handhole Assembly, 17 inch x 30 inch	Each

Handhole Assembly, ___ inch x ___ inch shall be paid for at their contract unit prices and shall include all labor, equipment, and materials to complete the work as specified herein.

The pay item shall also include the excavation and disposal of materials, furnishing, installing and compacting MDOT Class II sand, and all work related to connecting handholes to new and existing conduits, whether shown on the plans or not.

**DETAILED SPECIFICATION
FOR**

ITEM # 901 - D.I. WATER MAIN, W/ POLYETHYLENE WRAP, 12 INCH, TR DET I, MOD

ITEM #902 - D.I. WATER MAIN, W/ POLYETHYLENE WRAP, 8 INCH, TR DET I, MOD

ITEM # 903 - D.I. WATER MAIN, W/ POLYETHYLENE WRAP, 6 INCH, TR DET I, MOD

ITEM #904 - BENDS AND REDUCERS, 12 INCH

ITEM #905 - BENDS AND REDUCERS, 8 INCH

ITEM #906 - BENDS AND REDUCERS, 6 INCH

ITEM #907 - TEES AND CROSSES

ITEM #908 - GATE VALVE-IN-WELL, 12 INCH

ITEM #909 - GATE VALVE-IN-WELL, 8 INCH

ITEM #910 - FIRE HYDRANT ASSEMBLY

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 hydrant, fire hydrant extensions, supplemental lighting towers, and all other materials necessary to complete the work as shown on the Plans, as detailed in this Special Provision, and as directed by the Engineer.

All water main installation and testing procedures shall be performed in accordance with the project plans, the requirements of this Special Provision, and as directed by the Engineer.

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; 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 Special Provision, and as directed by the Engineer.

The work of installing a gate valve-in-well shall include installation and backfill of the specified valve, furnishing and installing pre-cast concrete gate wells including the concrete base, straight pre-cast concrete sections, transition sections, and the adjustment of the structure cover. No separate payment will be made for adjusting the structure covers on new gate wells. The gate well cover shall be paid as "Dr Structure Cover." Upon completion of the work, the Contractor shall clean the Gate Well to the approval of the Engineer.

The gate valve box shall be paid for as "Dr Structure Cover." The cost of adjusting new gate valve-in-boxes shall be included in the unit price for Gate Valve-in-Box and shall not be paid for separately.

The fire hydrant assembly work shall include the hydrant, the 6 inch gate valve-in-box, 3 feet of 6 inch pipe, the thrust block, and any required extensions to install the fire hydrant to the finish grade as shown on the plans.

MATERIALS

1. Submittals. Prior to beginning construction, the Contractor shall submit the following:

- A. Product data on all ductile iron pipe, valves, 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.
- 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 Pressure Class 350 (Table 50.5 ANSI/AWWA C150/A21.50), or Thickness Class 50 (Table 50.15, ANSI/AWWA C150/A21.50). Ductile iron pipe crossing under a railroad shall be thickness Class 56.

Cast ductile iron river crossing pipe shall be Clow Corp. "F-141 River Crossing Pipe", U.S. Pipe "USIFLEX Boltless Flexible Joint Pipe" or equal approved by the Engineer, and shall be thickness Class 56 minimum. The pipe shall have a boltless flexible joint of the ball and socket type, and be designed for, and rated at, a minimum interior working water pressure of 250 psi.

Restrained joint pipe, where called for on the Plans, shall be factory manufactured by the installation of retainer weldment and ductile iron locking segments or rings. Restrained joint pipe shall be TR-Flex restrained joint pipe manufactured by U.S. Pipe, Lok-Ring joint pipe manufactured by American Ductile Iron Pipe, or equal as approved by the Engineer.

Cast ductile iron fittings shall be push-on joint, unless otherwise specified (with the exception of solid sleeves and fire hydrants which shall be mechanical joint), meeting the requirements of ANSI/AWWA C110/A21.10 for short body cast iron fittings. Fittings shall have a cement mortar lining and asphaltic seal coat in accordance with ANSI/AWWA C104/A21.4 and ANSI/AWWA C110/A21.10. The outside of all fittings shall have an asphaltic coating in accordance with ANSI/AWWA C110/A21.10.

Solid sleeves shall be long-pattern sleeves.

B. Gate Valves and Gate Valve Boxes :

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

- i. Metroseal 250 Resilient Seated Gate Valve as manufactured by U.S. Pipe & Foundry Company
- ii. U. S. Pipe and Foundry Tyton Joint, Resilient Wedge Seated Gate Valve, meeting the requirements of AWWA C 509, AWWA C550, and ASTM D 2794
- iii. American Flow Control, Series 2500, Single Resilient Wedge

- iv. East Jordan Iron Works FlowMaster Resilient Wedge Valve
- v. Mueller Series, 4" through 12", A-2360-38, Resilient Wedge – SL x SL
- vi. Tyler Series DRS 250-22 Double Resilient Wedge

All valves shall come equipped with a two-inch square operating nut, opening right.

Valve Boxes shall be Tyler 6860 Buffalo type, Size D, screw-type, 3 piece, 5-1/4 inch shaft and a No. 6 Base for a valve 8 inches or less and a No. 8 base for 10 and 12 inch valves.

C. Fire Hydrants:

Fire hydrants shall be East Jordan Iron Works Model 5-BR Water Master BR 250 with traffic flange; American Flow Control 5-1/4" Pacer, WB 67-250; or, Waterous Model TCV-5 with traffic flange. All fire hydrants shall have the following features: a 6 inch mechanical joint pipe connection, ANSI/AWWA C111/A21.11; two 2-1/2 inch National Standard hose connections; one 4 inch Stortz pumper connection; 1-3/8 inch pentagon operating and cap nuts (1-3/8 in. point-to-flat at top; 1-7/16 in. point-to-flat at base); open left; breakable flange construction; no barrel drain; and a painted red finish. Depth of bury (bottom of pipe to ground surface) is generally 6 feet but may vary depending on specific site conditions. The Stortz pumper connection must be 21 in. ± 3 in. above finished grade, and the breakable traffic flange must be between finished grade and 8 in. above finished grade.

Fire hydrant extensions shall be fully compatible with the manufacturer of the fire hydrant assembly provided and be approved by the Engineer. East Jordan Iron Works hydrants shall be provided with a model 5-BR extension kit; and, Waterous Fire Hydrants shall be provided with a F1-K562-6 extension kit.

All fire hydrants must be certified by Underwriters Laboratory (UL) or the National Sanitation Foundation (NSF) for use in a potable water system.

D. Tapping Sleeves and Valves:

Tapping sleeves and valves shall be manufactured of cast iron or stainless steel and designed for water service with a minimum working pressure of 150 psi. The sleeve shall be a full-bodied split sleeve design manufactured by one of the following manufacturers:

- i. Clow No. F-5205;
- ii. Mueller Co. No. H-615;
- iii. Waterous Series 800;
- iv. East Jordan Iron Works MJ Tapping Sleeve with East Jordan FlowMaster RW Valve;
- v. Tyler/Union D.I. MJ Tapping Sleeve;
- vi. Ford Meter Box Company Style FTSS;
- vii. Power Seal Model No. 3490 AS;
- viii. Smith Blair Model No. 622;
- ix. JCM 432 All Stainless Steel Tapping Sleeve; and
- x. Price Brothers Company Tapping Sleeve for Prestressed Concrete Steel Cylinder Pipe (only to be used on concrete water mains.)

Tapping Sleeves for Prestressed Concrete Steel Cylinder Pipe shall be in accordance with AWWA

M-9. The sleeves shall have a separate gland which permits installation of the sleeve prior to cutting of the prestress wires. The gland shall have a fusion epoxy coated (per AWWA C-213) waterway, and a broad gasket set in a retaining groove of a pressure plate gusseted to eliminate flexing. The gland shall be equipped with load bearing set screws to protect the cylinder. Grout under saddle is needed whether saddle is epoxy coated or not. Sleeves shall be furnished with grouting seals and grout horns to facilitate filling the space between the sleeve and the pipe. Tapping sleeves shall be a Price Brothers Company Tapping Sleeve for Prestressed Concrete Steel Cylinder Pipe or approved equal.

Tapping valves shall be double-disk type of the same manufacture as the sleeve, NRS with two-inch square operating nut-opening right, with a mechanical joint outlet.

All tapping sleeves and valves must be certified by Underwriters Laboratory (UL) or the National Sanitation Foundation (NSF) for use in a potable water system.

E. 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)

Corrosion Resistance: as measured by;

ASTM D 1308	Muriatic Acid 31% HCL	24 hours	No Effect
	Sulfuric Acid 93% H ₂ SO ₄	24 hours	No Effect
	Caustic Soda 100% NaOH	24 hours	No Effect
	Methy Ethyl Keytone MEK	24 hours	No Effect
	Salt Fog	1,000 hours	No Effect
ASTM B117			

The flouropolymer coating shall strongly adhere to surface being coated and shall not flake off or be easily removed by rubbing or brushing.

Cast ductile iron river crossing pipe joints shall be a push-on type ball and socket joint utilizing a first grade rubber gasket. The joint shall be capable of 15-degree full turning deflection without separation, leakage, or restriction of the pipe waterway. Joint restraint shall be provided by a boltless means which is locked against accidental disengagement of the restraining component. Pipe shall be furnished with the necessary gaskets, lubricant, and retainer locking accessories.

Joints for restrained joint pipe shall be in accordance with ANSI/AWWA C111/A211.11. Bolts and nuts for the retainer assembly shall be stainless steel.

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.

F. 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.

G. Casing Pipe:

Steel casing pipe used for construction at railroad or State highway crossings shall comply with the following minimum requirements unless more stringent requirements are established by the railroad or State. Casing pipes at other locations shall comply with the following minimum requirements unless otherwise indicated on the Plans or in the Specifications.

<u>Nominal Diameter of Casing Pipe (Inches)</u>	<u>Minimum Wall Thickness (Inches)</u>
Under 14	0.250
14, 16, and 18	0.312
20 and 22	0.375
24, 26, 28, and 30	0.500
32 and 34	0.563
36, 38, 40, 42, and 48	0.625

Steel pipe shall be non-spiral pipe and have a minimum yield strength of 35,000 psi. All joints shall be made leakproof using full penetration, continuous welds. Welds shall be ground smooth outside and inside (except inside 22 in. diameter and less) to prevent conflict with the soil or pipe placement. Steel pipe shall meet the requirements of ASTM A 53, Type E or S, Grade B.

Pipe Marking

The following information shall be clearly marked on each length of pipe:

- i. The pipe designation and class (e.g. A 53, Type S, Grade B.)
- ii. The name or trademark of the manufacturer.
- iii. Identification of the manufacturing plant.

Inspection

All casing 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 that, independent of physical tests specified under the standard specifications designated herein, fails to conform to the requirements of these Specifications.

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.

H. Water Main Pipe Marking:

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

- i. The pipe designation and class (e.g., D.I., Class 50).
- ii. The name or trademark of the manufacturer.
- iii. Country where cast.
- iv. The year in which the pipe was produced.

The following shall be distinctly cast on each fitting:

- v. The pressure rating of the fitting.
- vi. Nominal diameters of openings.
- vii. The name or trademark of the manufacturer.
- viii. Country where cast.
- ix. The number of degrees or fraction of the circle on all bends.
- x. Ductile iron fittings shall have the letters "DI" or "Ductile" cast on them.

I. 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.

J. 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.

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:

- i. Variation in any dimension exceeding the permissible variations given in the material specifications.
- ii. 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.
- iii. Any signs of physical damage or poor manufacturing which might render the material unsuitable for its intended use.
- iv. Variation of more than 1/16 inch per lineal foot in alignment of pipe intended to be straight.
- v. Damaged ends, where in the judgment of the Engineer such damage would prevent making a satisfactory joint.
- vi. 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.

K. 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.

CONSTRUCTION

(Including 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.

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.

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 the Engineer. The deflection shall not exceed the following amounts:

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

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

E. 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 effect the joint seal, the outside of the cut end shall be tapered back 1/8 inch with a coarse file or a portable grinder at an angle of about 30 degrees. The tapering must remove all sharp and/or rough edges which might injure the gasket.

The flame cutting of pipe will not be allowed. Reinforced concrete water main pipe shall not be cut.

F. 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.

G. 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.

Hydrants shall be set to stand plumb with their nozzles parallel to the street and the pumper nozzle facing the street. Hydrants shall be set with pumper nozzles between 18 and 24 inches above finished grade, or as directed in writing by the Engineer.

H. 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.

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.

I. Abandonment or Removal of Water Main:

The Contractor shall abandon or remove water main(s) where shown on the Plans. All work shall be performed in accordance with the Special Provision entitled “Water Main and Appurtenances, Remove or Abandon.”

J. 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.

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.

K. 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.

L. 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 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/ft³ density) swab, or Engineer approved equal and flushed. The diameter of the blow-off pipes shall be at least 50% of the diameter of the pipe being flushed. Hydrants, with internal components removed, may serve as blow-offs for mains 12 inches and less. The Contractor shall provide details, for the review and approval of the Engineer, for the various required blow-offs. Blow-off pipes, discharge hoses, where needed, and associated costs shall be included in the cost of the permanent water main being installed and will not be paid for separately. If there are no branch connections to be swabbed, the poly-pig shall be inserted in the new water main at the time of connection described above. The poly-pig shall be located on the "downstream" or new side of the separation valve. The poly-pig shall then be forced through the new water main during the first flush and discharged through a construction blow-off of sufficient size to allow passage of the poly-pig. For water mains with branch connections, a launching tee or wye shall be installed as shown in the details, for launching multiple poly-pigs. The main line and each branch main shall be flushed and swabbed individually. Following the successful final bacteriological testing of the water main, the launching tee/wye shall be permanently capped at its branch.

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.

L. 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.

M. 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. 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.

CONSTRUCTION
(General Requirements)

The Contractor shall be responsible for coordination with the City of Ann Arbor Field Operations Unit for the installation of 1-inch corporations in the gate wells to be used for water main testing and/or filling of new main.

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.

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 Special Provision.

MEASUREMENT AND PAYMENT

The completed work will be paid for at the contract unit prices for the following contract items (pay items):

<u>PAY ITEM</u>	<u>PAY UNIT</u>
D.I. Water Main, w/ Polyethylene Wrap, 12 inch, Tr Det I, Mod	Foot
D.I. Water Main, w/ Polyethylene Wrap, 8 inch, Tr Det I, Mod	Foot
D.I. Water Main, w/ Polyethylene Wrap, 6 inch, Tr Det I, Mod	Foot
Bends and Reducers, 12 inch	Each
Bends and Reducers, 8 inch	Each
Bends and Reducers, 6 inch	Each
Tees and Crosses	Each
Gate Valve-in-Well, 12 inch	Each
Gate Valve-in-Well, 8 inch	Each
Fire Hydrant Assembly	Each

All work shall be paid in full at the contract unit prices which shall include all the 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.

Valve Box Extensions will only be paid for if they are required by the plans and they are not required due to the Contractor’s operations.

**DETAILED SPECIFICATION
FOR
ITEM #915 – EXCAVATE AND BACKFILL WATER SERVICE TRENCH TAP AND LEAD**

DESCRIPTION

This work shall consist of exposing new or existing water mains and excavating and backfilling a trench, at the locations shown on the drawings, or as directed by the Engineer, for the purpose of installing new water services or transferring existing water services to new water mains or replacing existing water services on existing water mains.

MATERIALS

The backfill material shall meet the requirements for Granular Material, Class II specified in section 902 of the Michigan Department of Transportation (MDOT) 2012 Standard Specifications for Construction.

CONSTRUCTION

The trench is to be excavated to the applicable MIOSHA standards for the purposes of transferring water services, installing water service taps, leads, and curb stops and boxes. The City will furnish all labor and materials for taps, leads, and curb stops and boxes. The Contractor will not be entitled to extra compensation due to delays caused by City of Ann Arbor personnel in performing work on the project. The Contractor shall be responsible for all coordination with the City of Ann Arbor – Field Operations personnel for the scheduling and execution of the work.

Granular Material Class II bedding (3 inch) and backfill material shall be placed in lifts not to exceed 12 inches and compacted to a minimum of 95% of its maximum dry density as measured by the AASHTO T-180 test.

MEASUREMENT AND PAYMENT

The completed work, as described, shall be paid for at the contract unit price for the following pay item:

PAY ITEM

PAY UNIT

Excavate and Backfill Water Service Trench Tap and Lead Linear Foot

Excavate and Backfill Water Service Trench Tap and Lead shall be measured by length in feet from the new or existing water main to the curb stop and box or the location where the new and existing water services are to be reconnected. The Contractor shall be aware that the plan quantities are estimates only. The actual amount of excavation and backfill may be significantly more or less based on actual field conditions. Price adjustments based upon subsection 103.02.B of the MDOT 2012 Standard Specifications for Construction shall not apply to this item of work.

Payment for **Excavate and Backfill Water Service Trench Tap and Lead** shall include, but not be limited to all labor, material, and equipment costs necessary to schedule and coordinate with City of Ann Arbor personnel for the work of transferring and/or installing new water services; expose and backfill the new water main; excavate, backfill, and compact the water service trenches; and, properly dispose of all excess excavated materials.

**DETAILED SPECIFICATION
FOR**

- ITEM # 920 - PAVT MRKG, WET RETRFLEC POLYUREA, 4 INCH, WHITE**
- ITEM #921- PAVT MRKG, WET RETRFLEC POLYUREA, 6 INCH, WHITE**
- ITEM #922 - PAVT MRKG, WET RETRFLEC POLYUREA, 4 INCH, YELLOW**
- ITEM #923 - PAVT MRKG, WET RETRFLEC THERMOPL, 12 INCH, CROSSWALK**
- ITEM #924 - PAVT MRKG, WET RETRFLEC THERMOPL, 12 INCH, CROSS
HATCHING, WHITE**
- ITEM #925 - PAVT MRKG, WET RETRFLEC THERMOPL, 24 INCH, STOP BAR**
- ITEM #926 - PAVT MRKG, WET RETRFLEC THERMOPL, SYMBOL**
- ITEM #927 – PAVT MTKG, TYPE R, 4 INCH, BLACK**

DESCRIPTION

This work consists of furnishing and installing wet night retroreflective (WR) beads and/or elements and liquid applied pavement marking materials. All work shall be consistent with the City of Ann Arbor Standard Specifications and the 2012 MDOT Standard Specifications for Construction, except as specified herein.

MATERIALS

Wet Night Retroreflective Beads and/or Elements. Select WR beads and/or elements from one of the following Manufacturers or a Department approved alternative that meets the requirements in Table 1:

- 3M Corporation
- Potter’s Industries
- Swarco
- Flex-o-Lite

Table 1: WR Markings

Average Initial Retroreflectivity at 30 meter geometry in mcd/lux/m ²		
Test Method	Color	
	White	Yellow
Dry (ASTM E 1710)	700	500
Wet Recovery (ASTM E 2177)	250	200

Ship the material to the job site in sturdy containers marked in accordance with subsection 920.01.A of the Standard Specifications for Construction.

Submit to the Engineer prior to the start of work:

- a. The Manufacturer’s recommended application rate of the beads/elements and the liquid applied pavement marking binder to be used on the project. If the Manufacturer’s recommended application rate differs from the specified rate in Table 811-1 of the Standard Specifications for Construction, the Manufacturer’s recommended rate supersedes the table values.
- b. Certification from the Manufacturer that when applied according to their application

recommendations the beads and/or elements meet the requirements shown in Table 1 above.

Binder. Provide a liquid pavement marking product of the binder type specified in the contract documents from section 811 of the Qualified Products List or as specified by special provision, or use an alternative binder as approved by the Engineer.

CONSTRUCTION

Place the binder and beads in accordance with the Manufacturers’ recommendations and sections 811 and 920 of the Standard Specifications for Construction except as noted above.

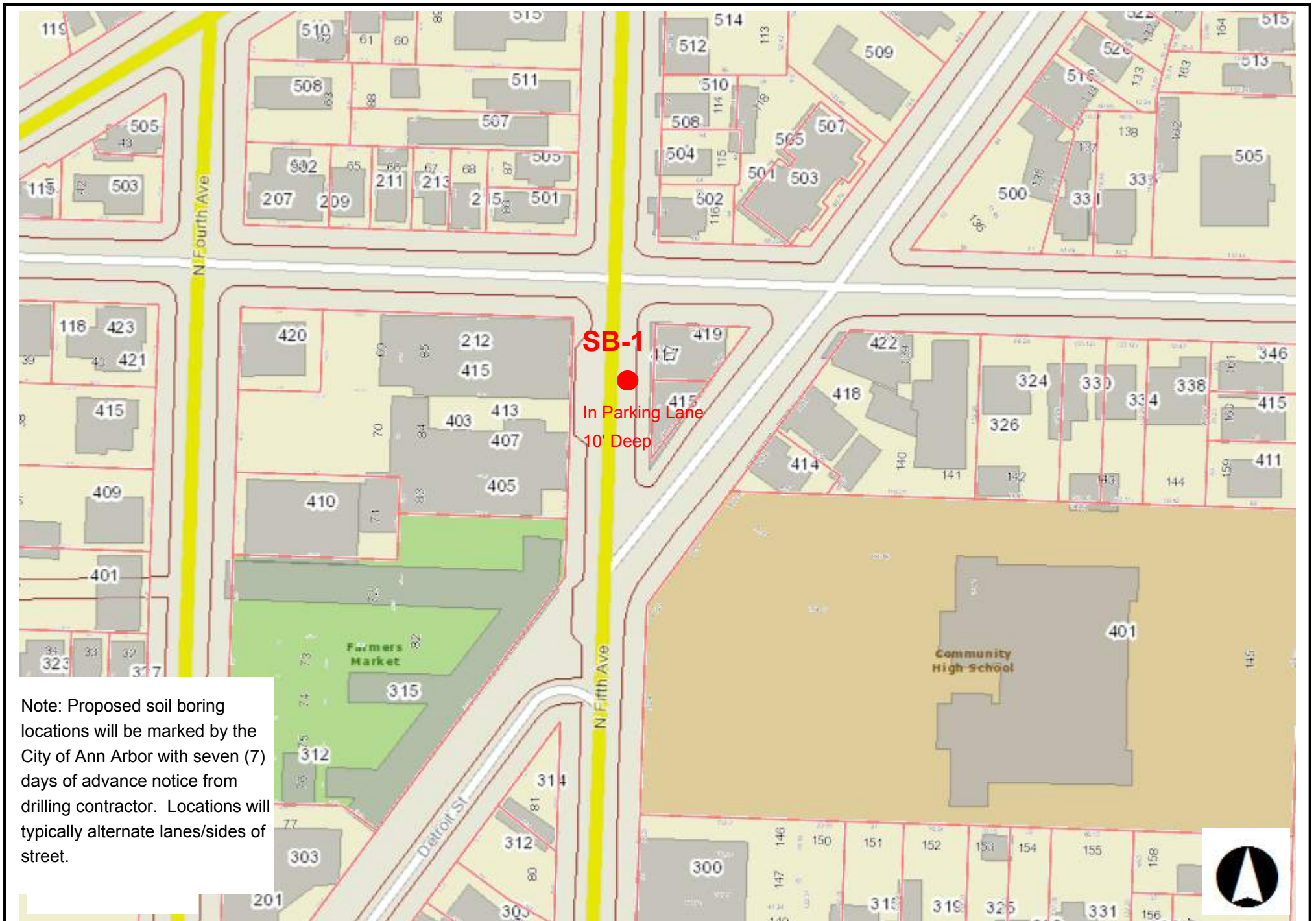
MEASUREMENT AND PAYMENT

The completed work, as described, will be measured and paid for at contract unit prices using the following pay items:

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Pavt Mrkg, Wet Retrflec Polyurea, 4 inch, White	Foot
Pavt Mrkg, Wet Retrflec Polyurea, 6 inch, White	Foot
Pavt Mrkg, Wet Retrflec Polyurea, 4 inch, Yellow	Foot
Pavt Mrkg, Wet Retrflec Thermopl, 12 inch, Crosswalk	Foot
Pavt Mrkg, Wet Retrflec Thermopl, 12 inch, Cross Hatching, White.....	Foot
Pavt Mrkg, Wet Retrflec Thermopl, 24 inch, Stop Bar	Foot
Pavt Mrkg, Wet Retrflec Thermopl, Symbol.....	Each
Pavt Mtkg, Type R, 4 inch, Black.....	Foot

The unit price for these items of work shall include all labor, material, and equipment costs to perform all the work.

APPENDIX



Note: Proposed soil boring locations will be marked by the City of Ann Arbor with seven (7) days of advance notice from drilling contractor. Locations will typically alternate lanes/sides of street.



SOIL BORING LOCATION MAP
N Fifth Ave/ E Kingsley/Detroit St

Scale is 11,200



Note: Proposed soil boring locations will be marked by the City of Ann Arbor with seven (7) days of advance notice from drilling contractor. Locations will typically alternate lanes/sides of street.

SOIL BORING LOCATION MAP
N fifth Ave/Detroit St/Catherine St

Scale is 1480





Project Number: 1178070011
 Project Name: 2017 Misc. Geotech
 Project Location: Ann Arbor, MI
 Client Name: City of Ann Arbor

Boring No: 5th SB-1
 Offset: 8' W of sidewalk, 13.5' E of crosswalk
 Street Name: N. Fifth Ave.
 Drilling Firm: Stearns Drilling
 Driller Name: M. Hefferan
 Drilling Method: HSA
 Drill Rig Model: CME 55/300
 Auger Size: 2.25" HSA
 Weather:

Date Started: 10/5/17 Completed: 10/5/17
 Time Started: Completed:
 Logged By: M.Partenio Checked By:

DEPTH (ft)	DESCRIPTION OF STRATA	LEGEND	SAMPLE	RECOVERY (in)	UCS (tsf) <small>*hand penetrometer</small>	MOISTURE (%)	PL MC LL		
							: ()	7
							-10 : 10 : 20 : 30 : 40		
							-10 : 10 : 20 : 30 : 40		
							-10 : 10 : 20 : 30 : 40		
0	4.5" ASPHALT PAVEMENT								
	CLAY (CL) - brown, some sand and silt, trace gravel, stiff, moist		SS-1	16	1.50	20.0			
5	SAND (SW) - brown, fine to coarse, some gravel, trace fines, medium dense, moist		SS-2	18					
	Boring Terminated on Obstruction								
10									

Groundwater During Drilling: N/A
 Groundwater After Drilling: N/A
 Cave-in Depth: 3.2
 End of Boring: 5.5 ft

Notes: Boring terminated at 5.5 ft on obstruction. Filled with auger cuttings and patched



Project Number: 1178070011
 Project Name: 2017 Misc. Geotech
 Project Location: Ann Arbor, MI
 Client Name: City of Ann Arbor

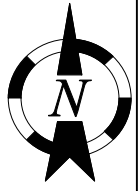
Boring No: 5th SB-2
 Offset: 6' E of Tesuya driveway
 Street Name: N. Fifth Ave.
 Drilling Firm: Stearns Drilling
 Driller Name: M. Hefferan
 Drilling Method: HSA
 Drill Rig Model: CME 55/300
 Auger Size: 2.25" HSA
 Weather:

Date Started: 10/6/17 Completed: 10/6/17
 Time Started: Completed:
 Logged By: M.Partenio Checked By:

DEPTH (ft)	DESCRIPTION OF STRATA	LEGEND	SAMPLE	RECOVERY (in)	UCS (tsf) *hand penetrometer	MOISTURE (%)	PL MC LL				
							: ()	7		
							: & Fines Content (%) &				
							, SPT N Value ,				
-10	-20	-30	-40	-10	-20	-30	-40	-10	-20	-30	-40
0	7" ASPHALT PAVEMENT										
	2" CONCRETE PAVEMENT										
	SILT (ML) - brown, some sand, trace gravel and organics, stiff, moist		SS-1	18	1.50	13.4					
	SAND (SW) - brown, fine to coarse, with gravel, trace fines, loose, moist		SS-2	15							
5	SAND (SW) - brown, fine to coarse, some gravel, trace fines, very dense to dense, moist		SS-3	10							
			SS-4	14							
10	End of Boring										

Groundwater During Drilling: N/A
 Groundwater After Drilling: N/A
 Cave-in Depth: 5.5
 End of Boring: 10 ft

Notes: Filled with auger cuttings and patched



Legend


 Soil Borings performed by Strata Drilling, Inc.
 on April 5 and 8, 2013



Ann Arbor Geotechnical
 Detroit Street
 Ann Arbor, Michigan



Project No. 120547B

Drawn by: JMH

Date: 4/18/13

Scale: NTS

Plate
 No. 1

Project Name: Ann Arbor Geotechnical

Project Location: Ann Arbor, Michigan

G2 Project No. 120547B

Latitude: N/A Longitude: N/A



Soil Boring No. **DT-1**

G2 Consulting Group, LLC

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
DEPTH (ft)	PRO-FILE	GROUND SURFACE ELEVATION: N/A	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Bituminous Concrete (3 inches)	0.3						
		Fill: Medium Compact Brown Gravelly Sand with trace clay	3.0	S-1	8 6 5	11			
5		Hard Brown Silty Clay with trace sand and gravel	5	S-2	7 12 19	31	12.6		9000*
	10		S-3	9 25 30	55	10.5		9000*	
	15		S-4	14 29 42	71	10.6		9000*	
		Hard Gray Silty Clay with trace sand and gravel	13.0						
15			15	S-5	8 23 32	55	9.0		9000*
20			20	S-6	14 42 51	93	8.6		9000*
25			25	S-7	20 30 48	78	8.7		9000*
		End of Boring @ 25ft							
30			30						
35			35						

SOIL / PAVEMENT BORING 120547B.GPJ G2_CONS.GDT 4/18/13

Total Depth: 25ft
 Drilling Date: April 5, 2013
 Inspector: J. Hayball, P.E.
 Contractor: Strata Drilling, Inc.
 Driller: D. Watkins

Water Level Observation:
 Dry during and upon completion of drilling operations

Notes:
 * Calibrated Hand Penetrometer

Drilling Method:
 2-1/4 inch, inside diameter, hollow-stem augers

Excavation Backfilling Procedure:
 Borehole backfilled with auger cuttings and capped with cold patch

Figure No. 1

APPENDIX

Test Boring Location Plans

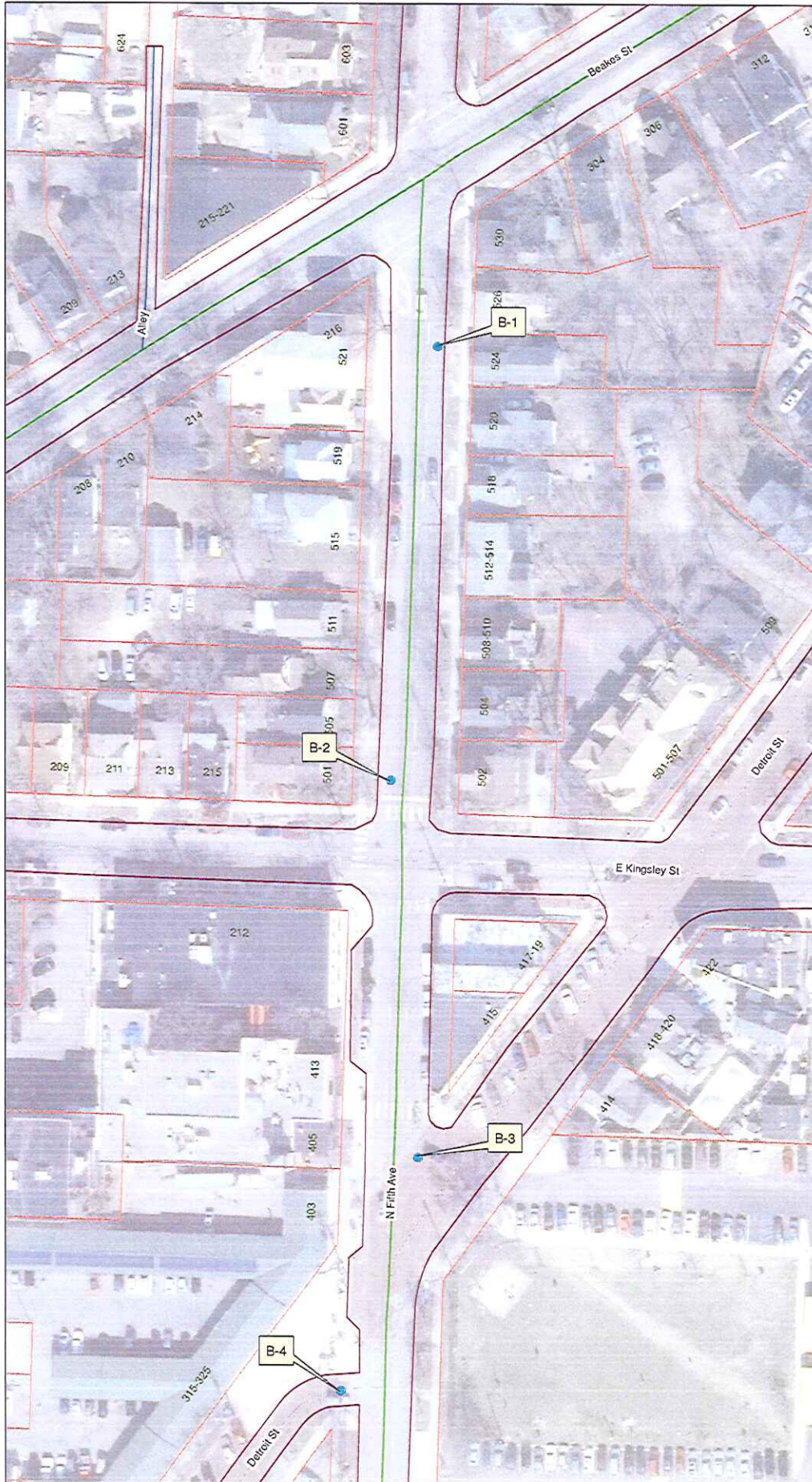
Logs Of Test Borings

Sieve Analysis Results

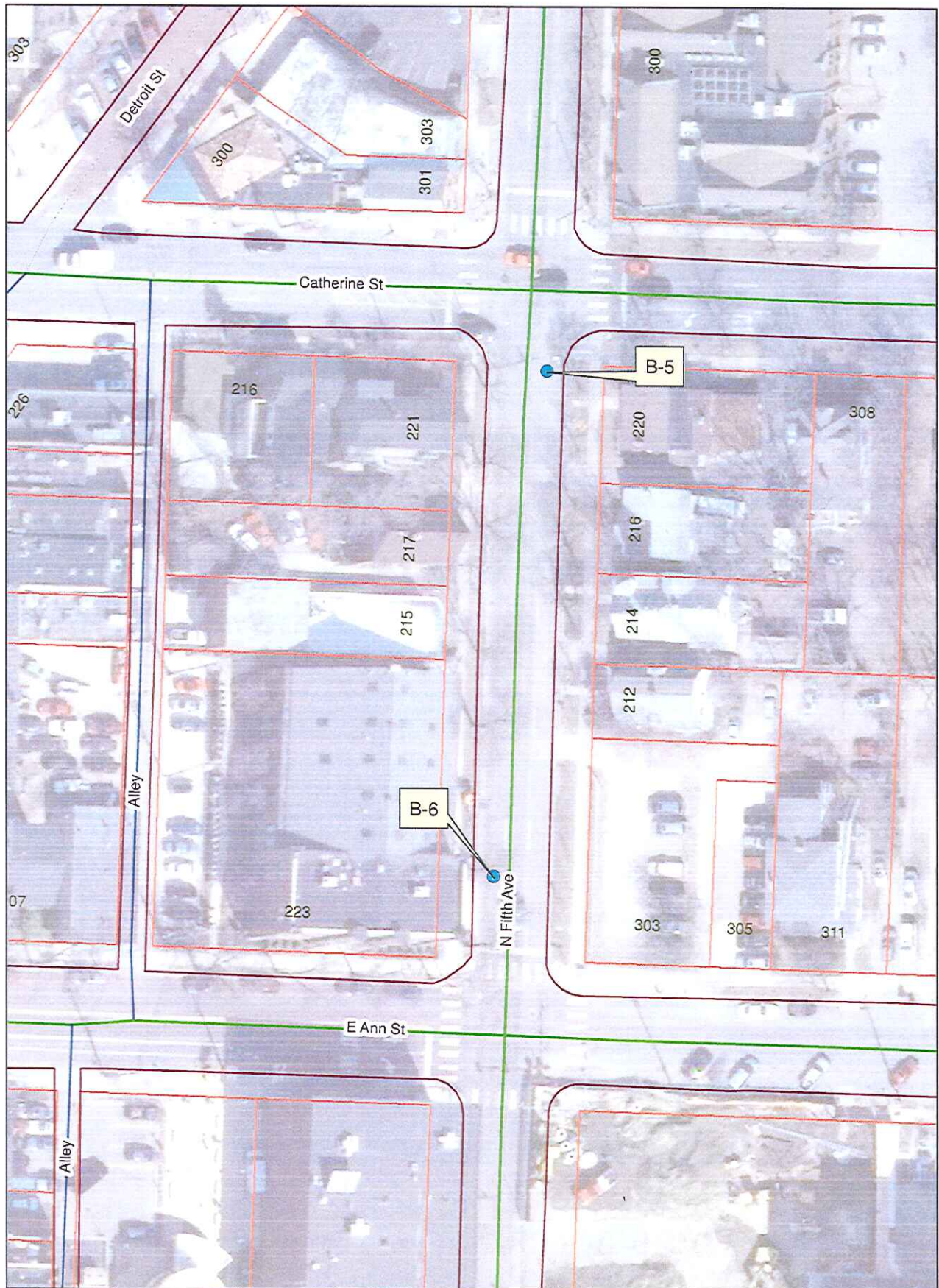
General Notes For Soil Classification

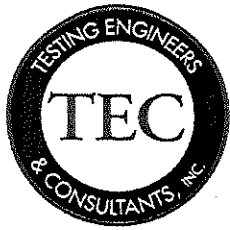
N. Fifth Ave.

1" = 60'



N. Fifth Ave. 1" = 60'





Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249

(248) 588-6200 or (313) T-E-S-T-I-N-G

Fax (248) 588-6232

Boring No.: FB1 N. Fifth	Job No.: 51989	Project: Miscellaneous Geotechnical Services, Bundle One
Client: City of Ann Arbor		
Type of Rig: Truck		Location: Ann Arbor, Michigan
Drilling Method: Solid Stem Augers		Drilled By: I. Mickle
Ground Surface Elevation:		Started: 11/23/2011
		Completed: 11/23/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			.67				
	LS	9	1.5	ASPHALT (8")	8.1	104	
2.5		6	2.5	Medium Compact Moist Brown Gravelly Well Graded Sand With Some Clay-FILL			
	LS	3	4	Medium Compact Moist Brown Clayey SAND With Trace Of Gravel	16.5	125	660
5.0		5					
	LS	4		Loose Moist Dark Brown Fine SAND	12.4	105	
7.5		4					
	LS	3	8	Loose Moist Brown Clayey Fine SAND	17.1	127	
10.0		3					
	LS	3	11	Loose Wet Brown Fine SAND With Trace Of Gravel			
12.5		5					
			13	Loose Moist Gray Clayey SAND			
15.0	LS	4		Stiff Moist Gray CLAY With Some Silt & Trace Of Gravel	12.5	142	10710
17.5		8					
	LS	5	19.5		10.4	147	15160
20.0		10	20	Extremely Stiff Moist Gray CLAY With Some Silt (6")			
22.5		22		Bottom of Borehole at 20"			

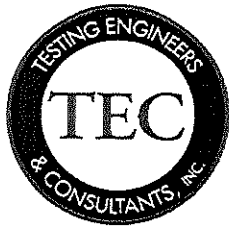
*N - Standard Penetration Resistance
 SS - 2" J.D. Split Spoon Sample
 LS - Sectional Liner Sample
 ST - Shelby Tube Sample
 AS - Auger Sample

w - H₂O, % of dry weight
 d - Bulk Density, pcf
 qu - Unconfined Compression, psf
 DP - Direct Push

Water Encountered: 8'0"

At Completion: 9'0"

Boring No. FB1 N. Fifth



Testing Engineers & Consultants, Inc.

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(248) 588-6200 or (313) T-E-S-T-I-N-G

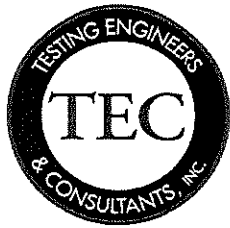
Fax (248) 588-6232

Boring No.: FB2 N. Fifth	Job No.: 51989	Project: Miscellaneous Geotechnical Services, Bundle One
Client: City of Ann Arbor		
Type of Rig: Truck		Location: Ann Arbor, Michigan
Drilling Method: Solid Stem Augers		Drilled By: I. Mickle
Ground Surface Elevation:		Started: 11/23/2011
		Completed: 11/23/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			.63				
			.83	ASPHALT (7 1/2")			
2.5	LS	4			7.9	101	
		4					
		6	2.3	Moist Brown Gravelly Well Graded Sand With Some Clay-FILL (2 1/2")			
	LS	6			8.4	106	
		10					
5.0		11		Loose Moist Brown Fine SAND			
			5.5				
	LS	18		Medium Compact Moist Brown Clayey SAND With Some Gravel & Cobbles	3.7	100	
		19					
7.5		19					
			8.5	Compact Moist Brown Clayey SAND & Gravel With Cobbles & Boulders			
10.0				Bottom of Borehole at 8.5'			
12.5							
15.0							
17.5							
20.0							
22.5							

"N" - Standard Penetration Resistance
 SS - 2" J.D. Split Spoon Sample
 LS - Sectional Liner Sample
 ST - Shelby Tube Sample
 AS - Auger Sample
 w - H₂O, % of dry weight
 d - Bulk Density, pcf
 qu - Unconfined Compression, psf
 DP - Direct Push

Water Encountered: None
At Completion: None
Boring No. FB2 N. Fifth



Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249

(248) 588-6200 or (313) T-E-S-T-I-N-G

Fax (248) 588-6232

Boring No.: FB3 N. Fifth	Job No.: 51989	Project: Miscellaneous Geotechnical Services, Bundle One
Client: City of Ann Arbor		
Type of Rig: Truck		Location: Ann Arbor, Michigan
Drilling Method: Solid Stem Augers		Drilled By: I. Mickle
Ground Surface Elevation:		Started: 11/23/2011
		Completed: 11/23/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
2.5	LS	7 5 7	.75 3	ASPHALT (2 1/2") Moist Brown Well Graded Sandy Gravel With Trace Of Silt-FILL (6 1/2")	6.8	112	
5.0	LS	2 3 6	5.5	Medium Compact Moist Dark Brown Sand With Trace Of Gravel-FILL Permeability= 1.66×10^{-3} cm/sec			
7.5	LS	10 11 15	8	Loose Moist Dark Brown & Black Sand With Some Gravel & Brick-FILL Medium Compact Moist Brown Fine To Medium SAND With Some Gravel	5.1	117	
10.0	LS	13 20 28	11	Compact Moist Brown Medium SAND With Some Gravel	6.1	134	
12.5				Bottom of Borehole at 11'			
15.0							
17.5							
20.0							
22.5							

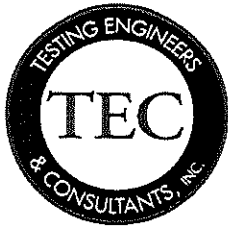
N - Standard Penetration Resistance
 SS - 2" D. Split Spoon Sample
 LS - Sectional Liner Sample
 ST - Shelby Tube Sample
 AS - Auger Sample

w - H2O, % of dry weight
 d - Bulk Density, pcf
 qu - Unconfined Compression, pcf
 DP - Direct Push

Water Encountered: None

At Completion: None

Boring No. FB3 N. Fifth



Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249

(248) 588-6200 or (313) T-E-S-T-I-N-G

Fax (248) 588-6232

Boring No.: FB-4 N. Fifth	Job No.: 51989	Project: Miscellaneous Geotechnical Services, Bundle One
Client: City of Ann Arbor		
Type of Rig: Truck		Location: Ann Arbor, Michigan
Drilling Method: Solid Stem Augers		Drilled By: I. Mickie
Ground Surface Elevation:		Started: 11/28/2011
		Completed: 11/28/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
2.5	LS	3 3 4	.75	ASPHALT (2 3/4") CONCRETE (6 1/4")	14.5	111	
5.0	LS	2 2 4	5.5	Loose Moist Brown Fine Sand-FILL	13.1	113	
7.5	LS	5 4 4	8	Loose Moist Brown Clayey SAND With Trace Of Gravel	9.8	105	
10.0	LS	4 5 5	12	Loose Moist Brown Medium SAND With Some Gravel	12.7	104	
15.0	LS	8 15 17	17.5	Compact Moist Brown Medium SAND With Some Gravel	4.7	106	
20.0	LS	6 6 7	20	Medium Compact Wet Brown Medium SAND With Trace Of Gravel	14.4	102	
22.5				Bottom of Borehole at 20'			

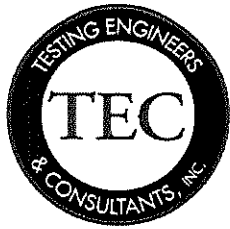
"N" - Standard Penetration Resistance
 SS - 2" J.D. Split Spoon Sample
 LS - Sectional Liner Sample
 ST - Shelby Tube Sample
 AS - Auger Sample

w - H₂O, % of dry weight
 d - Bulk Density, pcf
 qu - Unconfined Compression, psf
 DP - Direct Push

Water Encountered: 17'6"

At Completion: Caved To 16'3"

Boring No. FB-4 N. Fifth



Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249

(248) 588-6200 or (313) T-E-S-T-I-N-G

Fax (248) 588-6232

Boring No.: FB-5 N. Fifth	Job No.: 51989	Project: Miscellaneous Geotechnical Services, Bundle One
Client: City of Ann Arbor		
Type of Rig: Truck		Location: Ann Arbor, Michigan
Drilling Method: Solid Stem Augers		Drilled By: I. Mickle
Ground Surface Elevation:		Started: 11/23/2011
		Completed: 11/23/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			.42				
			1.23	ASPHALT (5")			
2.5	LS	4			11.9	111	
		5					
		5					
			3	CONCRETE (9 3/4")			
	LS	3		Loose Moist Brown Clayey SAND With Some Gravel	9.7	117	
		5					
		8					
5.0				Medium Compact Moist Brown Medium SAND With Some Gravel			
	LS	13			12.0	119	
		13					
		13					
7.5							
	LS	14			4.3	135	
		13					
		14					
10.0							
	LS	2			4.2	104	
		4					
		8					
15.0							
17.5							
	LS	5					
		6					
		6	20				
20.0				Bottom of Borehole at 20'			
22.5							

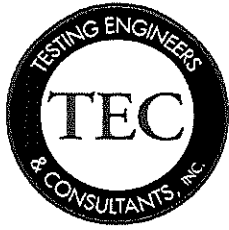
"N" - Standard Penetration Resistance
 SS - 2" J.D. Split Spoon Sample
 LS - Sectional Liner Sample
 ST - Shelby Tube Sample
 AS - Auger Sample

w - H₂O, % of dry weight
 d - Bulk Density, pcf
 qu - Unconfined Compression, psf
 DP - Direct Push

Water Encountered: None

At Completion: None

Boring No. FB-5 N. Fifth



Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249

(248) 588-6200 or (313) T-E-S-T-I-N-G

Fax (248) 588-6232

Boring No.: FB-6 N. Fifth	Job No.: 51989	Project: Miscellaneous Geotechnical Services, Bundle One
Client: City of Ann Arbor		
Type of Rig: Truck		Location: Ann Arbor, Michigan
Drilling Method: Solid Stem Augers		Drilled By: I. Mickle
Ground Surface Elevation:		Started: 11/28/2011
		Completed: 11/28/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
0.0			33				
0.75			33				
2.5	LS	5 3 3		ASPHALT (4") CONCRETE (5")	12.1	144	
5.0	LS	3 5 7	4	Loose Moist Dark Brown Clayey SAND With Trace Of Gravel	8.0	104	
5.5			5.5	Medium Compact Moist Brown Clayey SAND With Some Gravel			
7.5	LS	17 15 18		Compact Moist Brown Medium SAND With Some Gravel, Pebbles & Clayey Seams	5.7	103	
10.0	LS	15 16 19			2.6	107	
12.5			12	Medium Compact Moist Brown Medium SAND With Some Gravel			
15.0	LS	11 15 13			4.6	120	
20.0	LS	9 10 9	20	Bottom of Borehole at 20'			
22.5							

"N" - Standard Penetration Resistance
 SS - 2" J.D. Split Spoon Sample
 LS - Sectional Liner Sample
 ST - Shelby Tube Sample
 AS - Auger Sample

w - H₂O, % of dry weight
 d - Bulk Density, pcf
 qu - Unconfined Compression, psf
 DP - Direct Push

Water Encountered: None

At Completion: None

Boring No. FB-6 N. Fifth



Testing Engineers & Consultants, Inc.

1343 Rochester Road • PO Box 249 • Troy, Michigan 48099-0249
 (248) 588-6200 or (313) T-E-S-T-I-N-G
 Fax (248) 588-6232

Date: December 16, 2011 TEC Job No. 51989
 Project: City of Ann Arbor Miscellaneous Geotechnical Services, Bundle One
 Client: City of Ann Arbor Submitted By: I. Mickle
 Source: Boring No. FB1 At 8" – 1' Tested By: J. Trenum
 Use:
 Remarks: Date Sampled: November 23, 2011

MECHANICAL ANALYSIS FORM

SIEVE SIZE	RETAINED WEIGHT	FRACTIONAL PERCENT	PERCENTS RETAINED	CUMULATIVE PASSING	SPEC.
3"					INITIAL WT. 528.9
2 1/2"					WT. AFT/WASH 427.4
1 1/2"					LBW GMS. 101.5
1"	0	0	0	100	LBW % 19.2
3/4"	13.1	2.5	2.5	97.5	CRUSHED %
1/2"	54.7	10.3	12.8	87.2	REQ'D CRSH. %
3/8"	27.2	5.1	17.9	82.1	CLAY IRONSTONE %
#4	65.4	12.4	30.3	69.7	SOFT PARTICLES %
#10	64.1	12.1	42.4	57.6	CHERT %
#20	55.4	10.5	52.9	47.1	SOFT & CHERT %
#30	19.0	3.6	56.5	43.5	FN. MODULUS
#40	18.4	3.5	60.0	40.0	MATERIAL DESCRIPTION
#100	68.5	12.9	72.9	27.1	Brown Gravelly Well
PAN	41.6	7.9	80.8		Graded Sand With Some Clay
LBW	101.5	19.2		19.2	
TOTAL	528.9	100			



Testing Engineers & Consultants, Inc.

1343 Rochester Road • PO Box 249 • Troy, Michigan 48099-0249
 (248) 588-6200 or (313) T-E-S-T-I-N-G
 Fax (248) 588-6232

Date: December 16, 2011
 Project: City of Ann Arbor Miscellaneous Geotechnical Services, Bundle One
 Client: City of Ann Arbor
 Source: Boring No. FB-3 At 2 1/2" – 9"
 Use:
 Remarks:
 TEC Job No. 51989
 Submitted By: I. Mickle
 Tested By: J. Trenum
 Date Sampled: November 23, 2011

MECHANICAL ANALYSIS FORM

SIEVE SIZE	RETAINED WEIGHT	FRACTIONAL PERCENT	PERCENTS RETAINED	CUMULATIVE PASSING	SPEC.
3"					INITIAL WT. 615.7
2 1/2"					WT. AFT/WASH 579.8
1 1/2"					LBW GMS. 35.9
1"	0	0	0	100	LBW % 5.8
3/4"	45.3	7.4	7.4	92.6	CRUSHED %
1/2"	114.2	18.6	26.0	74.0	REQ'D CRSH. %
3/8"	91.3	14.8	40.8	59.2	CLAY IRONSTONE %
#4	96.0	15.6	56.4	43.6	SOFT PARTICLES %
#10	77.5	12.6	69.0	31.0	CHERT %
#20	48.9	7.9	76.9	23.1	SOFT & CHERT %
#30	18.5	3.0	79.9	20.1	FN. MODULUS
#40	17.3	2.8	82.7	17.3	MATERIAL DESCRIPTION
#100	51.3	8.3	91.0	9.0	Brown Well Graded Sandy
PAN	19.5	3.2	94.2		Gravel With Trace Of Silt
LBW	35.9	5.8		5.8	
TOTAL	615.7	100			

Testing Engineers & Consultants, Inc.

Mr. Nicholas S. Hutchinson, P.E.
City of Ann Arbor
January 9, 2012

TEC Report: 51989

SOIL DESCRIPTIONS

In order to provide uniformity throughout our projects, the following nomenclature has been adopted to described soil characteristics:

CONSISTENCY AND RELATIVE DENSITY

COHESIVE SOILS		GRANULAR SOILS	
<u>"N"</u>	<u>CONSISTENCY</u>	<u>"N"</u>	<u>RELATIVE DENSITY</u>
<u>VALUES</u>		<u>VALUES</u>	
0 – 2	Very Soft	0 – 4	Very Loose
2 – 4	Soft	4 – 10	Loose
4 – 8	Plastic	10 – 30	Med. Compact
8 – 15	Firm	30 – 50	Compact
15 – 30	Stiff	50+	Dense
30 – 60	Ex. Stiff		
60+	Hard		

Material Types By Particle Size

BOULDERS

COBBLES

GRAVEL

COARSE SAND

MEDIUM SAND

ASTM D2487

Stones Over 12" In Diameter

Stones 3" To 12" In Diameter

#4 To 3" Diameter

#10 To #4 Sieves

#40 To #10 Sieves

Testing Engineers & Consultants, Inc.

Mr. Nicholas S. Hutchinson, P.E.
City of Ann Arbor
January 9, 2012

TEC Report: 51989

SOIL DESCRIPTIONS (Cont'd)

Material Types By Particle Size

FINE SAND

SILT

CLAY

PEAT

MARL

SWAMP BOTTOM DEPOSITS

ASTM D2487

#200 To #40 Sieves

Minus #200 Sieve Material,
Fairly Non-Plastic, Falls Below
"A"-Line

Minus #200 Sieve Material Plastic
Material That Has A Tendency To
Stick Together, Can Be Rolled
Into Fine Rods When Moistened;
Falls Above "A"-Line

Black Organic Material
Containing Partially Decayed
Vegetable Matter

Fresh Water Deposits Of Calcium
Carbonate, Often Containing
Percentages Of Peat, Clay
& Fine Sand

Mixtures Of Peat, Marl,
Vegetation & Fine Sand
Containing Large Amounts Of
Decayable Organic Material

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 \$13.13/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 \$14.65/hour for those employers that do not provide health care. The Contractor or Grantor understands that the Living Wage is adjusted and established annually on April 30 in accordance with the Ordinance and covered employers shall be required to pay the adjusted amount thereafter to be in compliance (Section 1:815(3)).

Check the applicable box below which applies to your workforce

Employees who are assigned to any covered City contract/grant will be paid at or above the applicable living wage without health benefits

Employees who are assigned to any covered City contract/grant will be paid at or above the applicable living wage with health benefits

- (b) To post a notice approved by the City regarding the applicability of the Living Wage Ordinance in every work place or other location in which employees or other persons contracting for employment are working.
- (c) To provide to the City payroll records or other documentation within ten (10) business days from the receipt of a request by the City.
- (d) To permit access to work sites to City representatives for the purposes of monitoring compliance, and investigating complaints or non-compliance.
- (e) To take no action that would reduce the compensation, wages, fringe benefits, or leave available to any employee covered by the Living Wage Ordinance or any person contracted for employment and covered by the Living Wage Ordinance in order to pay the living wage required by the Living Wage Ordinance.

The undersigned states that he/she has the requisite authority to act on behalf of his/her employer in these matters and has offered to provide the services or agrees to accept financial assistance in accordance with the terms of the Living Wage Ordinance. The undersigned certifies that he/she has read and is familiar with the terms of the Living Wage Ordinance, obligates the Employer/Grantee to those terms and acknowledges that if his/her employer is found to be in violation of Ordinance it may be subject to civil penalties and termination of the awarded contract or grant of financial assistance.

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, 2017 - ENDING APRIL 29, 2018

\$13.13 per hour

If the employer provides health care benefits*

\$14.65 per hour

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

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

ENFORCEMENT

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

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

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

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

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



Vendor Conflict of Interest Disclosure Form
--

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

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

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

Conflict of Interest Disclosure*	
Name of City of Ann Arbor employees, elected officials or immediate family members with whom there may be a potential conflict of interest.	<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.

I certify that this Conflict of Interest Disclosure has been examined by me and that its contents are true and correct to my knowledge and belief and I have the authority to so certify on behalf of the Vendor by my signature below:		
Vendor Name	Vendor Phone Number	
Signature of Vendor Authorized Representative	Date	Printed Name of Vendor Authorized Representative

Questions about this form? Contact Procurement Office City of Ann Arbor Phone: 734/794-6500, procurement@a2gov.org

CITY OF ANN ARBOR NON-DISCRIMINATION ORDINANCE

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

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

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

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

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

Complaint Procedure: If any individual believes there has been a violation of this chapter, he/she may file a complaint with the City's Human Rights Commission. The complaint must be filed within 180 calendar days from the date of the individual's knowledge of the allegedly discriminatory action or 180 calendar days from the date when the individual should have known of the allegedly discriminatory action. A complaint that is not filed within this timeframe cannot be considered by the Human Rights Commission. To file a complaint, first complete the complaint form, which is available at www.a2gov.org/humanrights. Then submit it to the Human Rights Commission by e-mail (hrc@a2gov.org), by mail (Ann Arbor Human Rights Commission, PO Box 8647, Ann Arbor, MI 48107), or in person (City Clerk's Office). For further information, please call the commission at 734-794-6141 or e-mail the commission at hrc@a2gov.org.

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

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

MICHIGAN DEPARTMENT OF TRANSPORTATION 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.	

